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# SAME-SEX FOCUS IN THE VISUAL ATTENTION OF HETEROSEXUAL WOMEN: AN INVESTIGATION OF POTENTIAL EXPLANATIONS

By

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A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Philosophy – Psychology

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August 2017

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**Dissertation Approval**

The Graduate College
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July 19, 2017

This dissertation prepared by

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ABSTRACT

**Same-Sex Focus in the Visual Attention of Heterosexual Women: An Investigation of Potential Explanations**

by

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When simultaneously presented with male and female erotic visual stimuli, heterosexual women have a significantly less category-specific pattern of visual attention, wherein they spend much more time viewing same sex stimuli than do men. Heterosexual men, on the other hand, have a much more category-specific pattern of visual attention, allocating nearly all of their visual attention to the female stimuli. The present study investigated several proposed explanations for women's more diffuse visual attention patterns: that heterosexual women may find some arousal value in viewing erotic female images given their greater sexual fluidity/erotic plasticity in comparison to men, that women may be engaging in social comparison with the same-sex images to an extent that men do not, that women may have a more erotic self-focus in comparison to men that translates into visual attention to other women, and/or that women may be empathizing and projectively identifying with the women in the images, given that women appear to have a greater empathic orientation . To test these potential explanations, 117 heterosexual women viewed 12 split-screen slides, each of which featured paired erotic photos of a nude man and a nude woman on each side of the screen, while their gaze patterns were tracked using an eye-tracker. Participants then completed a series of measures designed to assess

individual variability on erotic fluidity, tendency toward appearance-based social comparison, erotic self-focus, and empathy orientation. Correlational and regression analyses were used to explore the relationship between women's visual attention patterns and their endorsements of the afore-mentioned constructs. Participants' endorsement of greater cognitive/affective arousal toward women (i.e., erotic fluidity) was significantly related to greater visual attention on the female, compared to male, images. It thus appears that, at the level of visual attention, self-identified heterosexual women who are more erotically fluid are more likely to focus on erotic images of nude women. These results support the contention that the visual attention to the female images might be arousal-based and it converges with more recent data on women's genital arousal patterns to visual sexual stimuli. Social comparison, erotic self-focus, and empathy orientation, as measured in this study, were not significantly related to visual attention patterns. Interpretations of these results, in light of this study's limitations, are discussed, as are future directions for this line of research.

ACKNOWLEDGEMENTS

First, I would like to thank my advisor, Dr. Marta Meana, for her patience, support, encouragement, and candid feedback throughout my graduate career, and on this project in particular. Marta, you have helped me weather many storms, for which I will never be able to thank you enough. I am so honored to have had the opportunity to work with and learn from you. Thank you to my committee members, Drs. Christopher Heavey, Michelle Paul, and Jennifer Keene, for your insights, comments, and fresh perspectives. I would also like to thank my undergraduate research assistants – Claudia Villasante and Jessica Habashy – for your time and dedication, without which this project would not have been possible. Thank you, Stoops, for your statistical advice and encouragement from the beginning of it all. Thank you to my family for their unwavering support and encouragement throughout the past seven years. I am extremely grateful to Caroline, Emily, Kim, and Evan – your friendship and love has meant so much to me, and I truly could not have made it through, personally and professionally, without you. Thank you, S-, for the many hats you've worn – each has been invaluable. And last, but never least, to Ruger, Leonidas, and Kallisto – for lighting up my life.

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# CHAPTER 1

# INTRODUCTION

Eye-tracking methodology has been increasingly used to examine visual processing of sexual stimuli, allowing researchers to precisely capture the location, frequency, and duration of fixations made on any visual stimulus. Greater visual attention indicates greater interest in the sexual stimulus, although the nature of that interest is unclear, particularly in women. Heterosexual men's visual attention patterns generally align with their stated erotic preferences, allocating much more attention to their erotic target (i.e., women) than to their non-erotic target (i.e., men); in contrast, heterosexual women's visual attention patterns are much more diffuse, attending to their non-erotic target (i.e., women) much more than men do (i.e., men; e.g., Akhter, Lykins, & Meana, 2014; Lykins, Meana, & Strauss, 2008; Rupp & Wallen, 2007; Tsujimura et al., 2009).

Men's visual attention patterns also align with genital measures of arousal (e.g., Chivers, Seto, Lalumière, Laan, & Grimbos, 2010; Harris, Rice, Quinsey, & Chaplin, 1996; Quinsey, Ketsetzis, Earls, & Karamanoukian, 1996) – and therefore demonstrate consistency in visual attention, self-report, and physiological measures of sexual arousal – providing an indication that their visual attention is likely a reflection of sexual interest. While women's diffuse visual attention patterns also align with their genital arousal – which occurs to stimuli featuring both their erotic and non-erotic targets (Chivers et al., 2010) – neither visual attention or genital arousal align with their self-reported sexual interest. This consistent and curious finding raises the question of why heterosexual women attend to female stimuli to the extent that they do.

One possibility is that heterosexual women's visual attention reflects their greater erotic fluidity and consequently greater arousability to a wide variety of stimuli. Supported by a

voluminous literature and converging with physiological measures of arousal, Baumeister (2000) and Diamond (2006) argue that women's sexuality is influenced more than men's by sociocultural and contextual factors, leading to a larger discrepancy between women's stated erotic preferences and their sexual desires and behaviors. Women's more diffuse visual attention to erotic stimuli may be a cognitive correlate of their more indiscriminant arousal to a variety of sexual stimuli, regardless of whether they feature their reportedly preferred erotic target.

Social comparison and objectification may be another process that could explain women's visual attention to same-sex images. Western society has largely emphasized the importance of women's physical appearance, and as a result both men and women have developed an objectifying gaze toward other women, viewing women as objects that exist for the pleasure of others (Strelan & Hargreaves, 2005). Women also adopt an objectifying gaze toward themselves, particularly when they have internalized cultural ideals of beauty, driving women to compare their own appearance with the appearance of other women, thus propagating the cycle of objectification (Lindner, Tantleff-Dunn, & Jentsch, 2012; Moradi & Huang, 2008; Myers & Crowther, 2007). Erotic stimuli may be an ideal breeding ground for women to compare their own bodies and appearance with those of nude women; an opportunity unlikely to occur in daily life.

Relatedly, an awareness of being viewed specifically as a sexual object and the act of engaging in self-evaluation of desirability may result in women beginning to eroticize themselves. In striving to become desirable to men, women must be able to appraise and have a sense of their own sexiness. Given that positive appraisals of their own desirability have been linked to sexual arousal (e.g., Graham, Sanders, Milhausen, & McBride, 2004; Trapnell, Meston, & Gorzalka, 1997), it is possible that women develop an erotically-valenced self-focus. Recent

evidence suggests that women may indeed have a greater erotic self-focus than men (Meana & Fertel, 2016; Moser, 2009), leading them to appreciate (and view) other women's sexuality just as they appreciate their own.

A final possibility is that women's more diffuse gaze patterns are a product of their greater emotional empathy, wherein all people in an image are attended to regardless of sexual arousal value. In viewing sexual images, women may be more likely than men to empathize with and projectively identify with actors in the scene. Whereas heterosexual men may engage a sexual stimulus by imagining that they are doing something with the actress, heterosexual women may try to imagine how the woman feels as a part of the sexual scenario, possibly even imagining that what is being done to the woman is actually happening to her (e.g., Money and Ehrhardt,1972).

In an attempt to illuminate the extent to which these potential explanations account for women's diffuse visual attention pattern when viewing erotic stimuli, this study investigated the relationship between women's visual attention patterns and their endorsement of sexual fluidity, penchant for physically-focused social comparison, erotic self-focus, and empathy orientation.

# CHAPTER 2

# LITERATURE REVIEW

In the following section, literature relevant to the proposed study is reviewed. The literature review will cover sex differences in visual attention to erotic stimuli, as well as the following proposed explanations for these sex differences: 1) erotic fluidity, 2) social comparison/objectification, 3) erotic self-focus, and 4) empathy/identification.

## Sex Differences in Visual Attention to Erotic Stimuli

Attempts to study sexual desire and arousal have found that there are differences in the way men and women experience and demonstrate desire and arousal. Measures of visual attention have become increasingly popular methods for evaluating these sex differences as these measures are objective, relatively unintrusive, and directly comparable in men and women. In order to become sexually aroused by a visual stimulus, one must first visually attend to and process that stimulus (Geer & Manguno-Mire, 1996). Continued visual attention then indicates that the stimulus is of interest and relevant to the current situation (Henderson & Hollingworth, 1999). Thus, in examining visual attention to erotic stimuli we are able to determine what men and women find visually, and possibly sexually, interesting.

Visual attention to erotic stimuli is typically assessed using viewing time or eye-tracking methodologies. Viewing time is a broader measure of visual attention in which participants are given the freedom to look at a set of pictures for as long as they choose while the amount of time spent looking at each picture is calculated, usually without their awareness. Longer viewing times are considered an indication of greater interest. Eye-tracking provides a more molecular measure of visual attention, measuring what part of the stimulus participants are attending to, when they are doing so, how many times they attend to each part of the stimulus, and for how

long. Generally, eye-tracking paradigms limit and standardize the exposure to each stimulus across participants.

Early visual attention studies began to establish the link between visual attention and sexual interest. Rosenzweig (1942) found that hypersexual men looked longer at sexual images than at non-sexual images, whereas low-sexual men looked at both image types equally. In another study, men looked longer at images that featured their preferred erotic target than images that did not (Zamansky, 1956). That is, heterosexual men looked longer at images of women and homosexual men looked longer at images of men. Leckart, Keeling, and Bakan (1966) presented heterosexual men and women with a set of 40 photos depicting a single woman or a single man and gave them unlimited time to view each photo separately. Men spent equal amounts of time viewing the male and female images; women, however, viewed the female images longer than the male images. Heterosexual men (Brown, Amoroso, Ware, Pruesse, & Pilkey, 1973) and women (Brown, 1979) have also been found to spend more time viewing photos as they increased in explicitness. Landolt, Lalumière, and Quinsey (1995) showed heterosexual men and women photos depicting the head and shoulders of opposite sex individuals. As attractiveness ratings increased, participants' viewing time also increased. Quinsey, Ketsetzis, Earls, and Karamanoukian (1996) showed heterosexual men and women nude images of male and female children, pubescents, and adults. Mirroring their subjective ratings of arousal, men and women viewed images of opposite-sex adults the longest. In this study, men viewed images of same-sex adults longer than women did.

To determine the validity of using viewing time as an objective measure of men's sexual interest, Harris, Rice, Quinsey, and Chaplin (1996) added penile plethysmography to measures of viewing time and ratings of sexual attractiveness. They showed a mixed group of hetero- and

homosexual child-molesting men and a group of heterosexual, non-offending men a series of photos of males and females ranging from age 5 years to adulthood. The correlation between ratings of sexual attractiveness and viewing time in the non-offending group was .91, suggesting that heterosexual men spent more time looking at photos of people they found more sexually attractive (nude adult women in this case). The correlation between ratings of sexual attractiveness and viewing time was .46 for the group of child molesters. The significantly lower correlation in the child molester group resulted from their rating adult female stimuli as being the most sexually attractive, yet not viewing them significantly longer than the other stimuli. Notably, the child molesting men viewed all stimuli for significantly less time than the non-offending men; this, coupled with their attractiveness ratings, seems to indicate that they approached the task in a defensive manner, perhaps trying to conceal their true interests. However, in both groups of men, viewing time patterns mirrored those of penile responses such that photos that were looked at longer also generated greater penile responses. Both viewing times and penile responses were able to discriminate between the two groups, providing further validity for the use of viewing time as an objective measure of sexual interest in men. Quinsey et al. (1996) similarly found that penile responses, viewing times, and sexual attractiveness ratings were positively correlated in a group of normal, heterosexual men.

Although the intuitive connection between sexual interest/arousal and viewing time had been mostly empirically supported, research using visual attention measures as an adjunct to genital and self-report measures of sexual arousal while investigating sex differences therein did not begin to proliferate until years later. Using both viewing time and eye-tracking paradigms, studies examining visual attention to erotic stimuli have found consistent sex differences in visual attention, mirroring results found in research using subjective and genital measures of

sexual arousal (e.g., Chivers, Seto, Lalumière, Laan, & Grimbos, 2010). In general, men have been found to have a relatively category-specific pattern of responding such that they become genitally aroused by and spend more time viewing their preferred erotic target (i.e., women for heterosexual men, and men for homosexual men). In contrast, heterosexual women have been found to have a comparatively non-category-specific pattern of responding such that they become genitally aroused by any explicit sexual stimulus and spend closer to equivalent amounts of time viewing both their erotic (i.e., men for heterosexual women) and non-erotic (i.e., women for heterosexual women) targets. Homosexual women exhibit a more category-specific pattern of sexual arousal, but not as category-specific as that of either heterosexual or homosexual men.

Lykins, Meana, and Kambe (2006) were the first to apply eye-tracking methodology specifically to sex research, allowing for expansion upon and specification of findings emanating from viewing time research. They sought to investigate whether or not there were differences in men and women's visual attention patterns to erotic and non-erotic images. Heterosexual men and women viewed erotic and non-erotic photographs of opposite sex individuals while the amount of time spent looking at the face, body, and context of each image within a 15-second interval was recorded. Both men and women attended more to bodies than faces or context, particularly when viewing the erotic images, indicating that there is indeed a difference in the way people view erotic compared to non-erotic images.

In 2008, Lykins, Meana, and Strauss again reported that they found men and women spent more time viewing bodies than faces and context, an effect that was more marked for the erotic photos. Most interestingly, however, was the finding that women's visual attention pattern was much more diffuse than that of men. Men allocated much more attention to the women in the photos (their erotic target) than to the men in the photos (their non-erotic target). In contrast,

women divided their attention relatively evenly between the men in the photos (their erotic target) and the women in the photos (their non-erotic target). This held true for both erotic and non-erotic photos.

This sex difference in attention to erotic versus non-erotic targets was also found by Israel and Strassberg (2009) who asked heterosexual men and women to rate how sexually appealing they found individual images of partially clothed men, partially clothed women, and neutral landscapes, while the time they spent viewing the images was simultaneously measured without their knowledge. Although both men and women viewed opposite-sex images longer than same-sex or neutral images, the difference was significantly larger in men. Women looked at same-sex photos significantly longer than men did, while men looked at opposite-sex photos significantly longer than women did. Sexual appeal ratings covaried with viewing time patterns, with the highest rated stimuli being viewed the longest. Interestingly, sexual appeal ratings did not correlate with viewing time in either men or women when examining opposite sex pictures only.

In yet another study, heterosexual women were found to view images of women (their non-erotic target) longer than sexual preference would predict. Rupp and Wallen (2009) had heterosexual men and women view photographs of heterosexual couples engaged in various sexual activities. Overall subjective ratings of the photos and viewing times of the photos did not differ between men and women. Both men and women spent more time viewing photos in which the female actor was more visible than the male actor, again indicating a stronger preference for viewing non-erotic targets in women than in men.

In a series of studies by Lippa and colleagues, both men's and women's viewing time increased as a function of model attractiveness regardless of participants' orientation and they

spent more time viewing their erotic than their non-erotic target (Lippa, 2012, 2013; Lippa, Patterson, & Marelich, 2010). However, this preference was much stronger in men than women, with no significant differences within the sexes based on orientation. In a more recent study with a large representative sample of over 2,800 U.S. adults, Lippa (2017) found that heterosexual and homosexual men's subjective attractiveness ratings and viewing time of a series of images of male and female swimsuit models were significantly more aligned with their erotic-target than were heterosexual and homosexual women's subjective attractiveness ratings and viewing time. In contrast to his previous studies, however, Lippa (2017) found that category specificity in women did differ based on sexual orientation, with homosexual women being the most category-specific, followed by heterosexual women, and bisexual and asexual women being the least category-specific.

Dawson and Chivers (2016) examined the number of first fixations on male and female images and time to first fixation in addition to total number of fixations and fixation duration. They found that both heterosexual men and women had a greater number of first fixations on female images than on male images, indicating that female images had greater attentional capture. The amount of time it took heterosexual women to make their first fixation on either the male or female images was not significantly different, indicating a lack of attentional bias toward male or female images, whereas heterosexual men's first fixations were significantly quicker toward the female images than the male images. However, when examining total fixation duration and number of fixations, women's visual attention was significantly greater toward male images than female images; the reverse was true for men's visual attention, and this category-specific pattern of visual attention was stronger in men than in women. Dawson and Chivers (2016) concluded that perhaps heterosexual women perceive nude images of both men

and women as sexual stimuli, whereas heterosexual men only perceive nude images of women as sexual.

Dawson, Fretz, and Chivers (2017) also examined the extent to which initial and subsequent visual attention to male and female stimuli varied among women with varying levels of self-reported attraction to men and women. They found that women reporting exclusive attraction to men initially oriented equally quickly to male and female images, women with some attraction to women exhibited a non-significant trend toward orienting more quickly to female images, and women with equal attraction to men and women and women who were more or exclusively attracted to women oriented significantly more quickly to female images. Women who were exclusively or predominantly attracted to men spent significantly more time viewing the male images than the female images, whereas the reverse was true for women reporting equal or more attraction to women. Dawson and colleagues (2017) also concluded that women who are exclusively attracted to men may find images of nude men and women to be sexually relevant or meaningful. Meanwhile, sustained visual attention may align more closely with self-reported sexual attraction.

Several studies have also sought to explore the effect of hormonal status on women's viewing patterns. Rupp and Wallen (2007) measured heterosexual men's, normally cycling heterosexual women's (not taking oral contraceptives [OCTs]), and contraceptive-using heterosexual women's visual attention patterns using an eye-tracker. Stimuli consisted of photos of heterosexual couples engaging in either oral or penetrative sex that were divided into various scene regions including: male and female face, male and female body, genitals, clothing, and background. Overall, opposite-sex faces were viewed more than same-sex faces by all groups. Female bodies received more attention than male bodies, and were viewed equally by all groups.

Male bodies, which received very little attention overall, were viewed longer by both groups of women than by men. Normally cycling women appeared to look more at genital regions than men and women on OCTs; women on OCTs looked more at clothing and background than normally cycling women or men. Furthermore, visual attention patterns were measured during each phase of the menstrual cycle, or spaced equivalents for women on OCTs; menstrual cycle phase had no effect on women's visual attention patterns. Similar results were obtained by Wallen and Rupp (2010) who also found that overall visual attention to erotic stimuli was not influenced by menstrual cycle phase. Likewise, Dawson, Suschinsky, & Lalumière (2012) found that viewing patterns remained relatively non-category-specific regardless of menstrual phase in their study asking heterosexual women to view and rate the sexual appeal of composite images of males and females. Based on the converging evidence, it thus appears that hormones may have some influence on viewing specific parts of an image – orienting naturally cycling women toward more reproductively salient information – but little effect on the category specificity of visual attention as a whole.

To investigate whether variations in category specificity of visual attention are more closely tied to natal sex or gender and identity, Akhter et al. (2014) presented heterosexual natal men and women and a group of androphilic (i.e., attracted to men) male-to-female transsexuals (MtFs) with split-screen photos of a single nude man and a single nude woman side-by-side, while their viewing patterns were measured via eye-tracking. Although men, women, and MtF transsexuals looked more at their erotic target than at their non-erotic target, this effect was more pronounced in men and MtF transsexuals. Both men and MtF transsexuals spent more time viewing their erotic target than did women; women spent more time viewing their non-erotic target than did men or MtF transsexuals.

To date, most of the erotic stimuli used in eye-tracking research have consisted of photographs of men and women in various states of undress and in various sexual positions. Intuitively we might expect that visual attention patterns would change when the stimulus is dynamic, as a video may provide more contextual information or may more easily engage viewers, both of which conceivably would narrow the viewers' focus, presumably toward their erotic target. However, results of the first video eye-tracking study conducted by Tsujimura et al. (2009) mirrored results of previous studies using static images. In a mildly erotic film in which a man and woman were kissing and touching, men viewed the female actress longer than did women, while women viewed the male actor significantly longer than did men. In a more sexually explicit film depicting a heterosexual couple engaging in intercourse, men and women's viewing patterns did not vary – both viewed the female actress's face and body much more than the male actor's face and body. In both videos, women spent more time viewing the same-sex actor than the opposite-sex actor; the opposite was true for men.

The research overwhelmingly points to a clear pattern in which natal men exhibit category-specific patterns of visual attention, preferentially viewing images of their erotic target, while natal women exhibit non-category-specific patterns of visual attention, with a comparatively smaller preference for viewing images of their erotic target over images of their non-erotic target. This pattern remains consistent even when variables such as genital focus of stimuli, model attractiveness, menstrual phase (in women), and gender identity are considered. The central question is thus, what could account for this pattern in which heterosexual women attend so much more to same-sex images than do heterosexual men?

One potential explanation is that erotic images of women have some arousal value for heterosexual women; visual attention may simply be a cognitive parallel to their genital arousal

when presented with erotic images of women. In other words, women's visual attention patterns may simply reflect their greater sexual fluidity and erotic plasticity. A voluminous body of research indicates that women's sexual preferences and behaviors are more likely to change across time and circumstance than are men's (Baumeister, 2000). Alternately, women may be engaging in appearance-focused social comparison. With the pressure to conform to specific bodily ideals so pervasive in Western society (Rodin, Silberstein, Striegel-Moore, 1984), it is not difficult to imagine that women may be looking at the women in the images to assess if and how they measure up. Another explanation is that women's attention to women may relate to their having a greater erotic self-focus than men, whereby they derive more sexual arousal and desire from focusing on themselves as objects of desire (Bogaert & Brotto, 2014; Meana & Fertel, 2016). Finally, women may simply be identifying with the woman in the photos as a function of having a greater empathy/identification orientation than men (e.g., Janssen, Carpenter, & Graham, 2003; Rupp & Wallen, 2009; Symons, 1979). The extent to which arousal (erotic plasticity/sexual fluidity), appearance-based social comparison/objectification, erotic self-focus, or empathy/identification orientation can account for women's viewing patterns to erotic stimuli is an empirical question at the heart of this study. We will now review the theoretical and empirical basis for hypothesizing a relationship between these complex constructs and heterosexual women's non-category-specific viewing patterns.

## The Erotic Plasticity/Sexual Fluidity Factor

Aligning with the visual attention literature, several lines of research support the theory that women have a more inclusive sexuality than men. In his seminal review article, Baumeister (2000) examined extant literature for sex differences in the relative influences of cultural and innate factors on sexuality. He coined the term "erotic plasticity" in reference to the extent to

which social, cultural, and/or situational factors influence the sexual attitudes, behaviors, and desires of individuals or groups, as evidenced by differential variability associated with these factors. Drawing from a voluminous literature, Baumeister provided a compelling argument that women are much more erotically plastic than men.

One line of evidence for his conclusion arose from research suggesting greater intraindividual variation in women's sexual attitudes and behaviors than in men's. Although Baumeister (2000) cited evidence that male children's sexuality appears open to external influences, it becomes relatively crystallized in adolescence and adulthood. Research indicates, however, that across the lifespan, women's attitudes and behavior continue to change and adapt to situations. The frequency with which women engage in sexual behavior, be it partnered or un-partnered, ebbs and flows, whereas it remains fairly consistent in men. Numerous studies indicate that women's attitudes and behaviors are more likely to evolve as a function of their relationships and, regardless of sexual orientation, women are more likely to have had sex with both men and women. Baumeister also claims that women's sexuality is influenced to a greater extent than it is in men by a variety of sociocultural factors. Frequency of sexual behavior, type of sexual behavior (i.e., masturbation, oral and anal sex), condom use, prevalence of sexual dysfunction, and same-gender activity all covary with culture, education, religion, and peer and parental influences to a greater extent in women than in men (Baumeister, 2000, 2004). These factors appear to work in a bidirectional manner, some constraining attitudes and behaviors, with others promoting more liberal attitudes and behaviors. Evidence also exists indicating that genetic factors have a greater influence on male sexuality. Finally, Baumeister (2000) points to literature indicating that women are more likely than men to engage in sexual behavior that contradicts their self-reported beliefs, values, and/or desires. Attitude-behavior discrepancies

have been noted in domains of premarital sex, condom use, casual sex, engaging in sex without a desire to do so, desiring certain sexual activities without engaging in them, and engaging in sexual activities with partners other than those they are reportedly oriented to.

Baumeister (2000) offered three potential explanations for women's erotic plasticity: that women essentially submit to stronger and more powerful men; that women act as sexual gatekeepers, requiring flexibility in receptivity to sexual activity; and/or that they have a weaker sex drive whereby sexual substitutes are acceptable if the ideal is unavailable or other more valued goals take precedence. He favored the third as the most powerful explanation, given strong research support for lower sexual desire in women (Baumeister, Catanese, & Vohs, 2001). Although there were criticisms of Baumeister's emphasis on women's lower sex drive to the exclusion of a more nuanced nature-nurture interaction (e.g., Tolman & Diamond, 2001), subsequent research has largely supported the greater erotic plasticity of women, although often differently explained.

Peplau (2001) provided a cross-cultural look at women's erotic plasticity/sexual fluidity. She described a variety of cultures in which intimate female-female relationships, some sexual, flourish when women gain independence from men or these relationships exist alongside intimate female-male relationships. Additionally, sexual orientation was not always linked to behavior. In some cultures, women in same-sex relationships were not considered to be homosexual, especially if they were the more feminine partner. She concluded that worldwide, female sexuality is more closely tied to the intimacy of the relationship rather than the gender of the partner, and that exclusive relationships with members of the same or opposite sex are less common than American research literature might indicate.

Aligning with Peplau's (2001) claims, Diamond's (2000, 2003, 2005, 2008) longitudinal 10-year study of young women initially partnered with women showed a surprising amount of movement from same-sex partners to opposite-sex partners and back over time, as well as a frequently perceived misalignment between traditional sexual orientation labels, identity and sexual behavior. Diamond proposed that women's erotic plasticity may be the result of the greater importance of emotional connections to women's development of sexual feelings, irrespective of partner sex. In an expansion of her theory and review of the evolutionary origins of female erotic plasticity, Diamond (2006) differentiates proceptivity (i.e., seeking out sexual behavior) from arousability (i.e., ability to become aroused). Unlike proceptivity, which is regulated by hormonal fluctuations and targeted toward reproduction, arousability occurs independently of hormonal status and is responsive to sexually stimulating stimuli in the internal or external environment. She theorizes that women are predominantly influenced by arousability, with proceptivity playing a more dominant role only during ovulation, while men remain consistently influenced by proceptivity. Diamond argues that Baumeister has mistakenly interpreted this arousability as compliance. Thus, women's sexual desire is not weaker, but rather more responsive to situational factors and less dependent on factors related to reproduction (such as seeking out sexual intercourse). It is also this greater influence of arousability in women that leads to a greater de-coupling of orientation and desires/behaviors.

Kuhle and Radtke (2013) recently proposed a third theory to account for women's sexual fluidity. They hypothesized that women's ability to secure female alloparents – un-related women who would help raise a woman's children in the absence of an investing father – rested on being able to form intimate bonds with other women, with sex being the most effective means to this end. Alloparenting was an evolutionarily advantageous arrangement when paternal

investment was absent or insufficient due to death, abandonment, or rape. Kuhle and Radtke hypothesized that women who have been abused or raped in child- or adulthood would subsequently engage in more same-sex behavior than those who were not. Their rationale was that these women would have historically been stigmatized and consequently were at risk for abandonment by their current partner and/or suffered a reduction in their mate value, impairing their ability to attract quality mates in the future. Furthermore, children born as the result of a rape were less likely to have an investing father than those born within the context of a stable partnership. Thus, the ability to form a relationship with another woman, with sex being one possible way to strengthen the bond, would have been particularly beneficial to women in these circumstances. While an interesting consideration in the evolutionary origins of female fluidity, the alloparenting hypothesis is neither empirically supported nor comprehensive enough to explain the variety of ways in which erotic plasticity manifests.

Although theories of why women's sexuality is more fluid differ, a wealth of data exists to support greater sexual fluidity in women than in men. Data from large scale surveys completed more than 10 years apart have found that women are more likely to identify as bisexual rather than exclusively homosexual, whereas the opposite appears true for men (Chandra, Mosher, Copen, & Sionean, 2011; Laumann, Gagnon, Michael, & Michaels, 1994). Women are also more likely than men to change their identified sexual orientation over the course of their life (e.g., Kinnish, Strassberg, & Turner, 2005; Savin-Williams, Joyner, & Rieger, 2012; Spitzer, 2003). Across the lifespan, both homosexual and heterosexual women have reported greater variation in their sexual attractions and fantasies than men (e.g., Baumeister, 2000; Dickson, van Roode, Cameron, & Paul, 2013; Kinnish et al., 2005). Women also display more day-to-day variability in their attractions to both their more- and less-preferred erotic target

than do men (Diamond, Dickenson, & Blair, 2017). Survey data of individuals aged 18-44 from the National Survey of Family Growth (Chandra et al., 2011) found that some same sex experience was reported by 4.6% of women (v. 2.8% of men) who identified as sexually attracted exclusively to the opposite sex, 47.4% of women (v. 20.6% of men) who identified as sexually attracted mostly to the opposite sex, and 9% of women (v. 3.2% of men) who identified as heterosexual. Furthermore, homosexual women have reported more opposite-sex sexual interactions than homosexual men (e.g., Baumeister, 2000). Chivers, Bouchard, and Timmers (2015) also reviewed a body of literature further suggesting that women's self-reported sexual identity is a poor indicator of their actual sexual attractions – as women may identify as heterosexual, yet still experience some degree of attraction to other women – and indeed exclusively male-attracted women may be in the minority.

Diamond (1998) found that only 32% of lesbians in her study reported being exclusively attracted to women. In a survey of predominantly lesbian women over the age of 50, almost 50% reported a history of being married to a man, with average marriage length being approximately 12.5 years (Averett, Yoon, & Jenkins, 2012). About 35% of the women reported having sexual fantasies, at least occasionally, that included men. Diamond (2000, 2003, 2005, 2008) examined the stability of non-heterosexual (i.e., lesbian, bisexual, or unlabeled) women's sexual identities, attractions, and behaviors over a 10-year period. Women frequently reported sexual attractions to members of both the same and opposite sex, and while these attractions remained rather stable, women's identities and behaviors changed over time. In the two years between the first and follow-up interview, a third of the women changed their sexual identity at least once, and about one fourth of self-identified lesbians engaged in sexual activity with men

(Diamond, 2000). Ten years after the initial interview with the same group of women, 67% had changed sexual identities at least once (Diamond, 2008).

One limitation of Diamond's (2000, 2003, 2005, 2008) longitudinal studies was that she did not include women who initially identified as heterosexual in her sample. Some evidence suggests that heterosexual women may have more stable sexual identities, attractions, and behaviors than non-heterosexual women (Savin-Williams & Ream, 2007). Kinnish et al. (2005) found that 3% of currently identified heterosexual women changed identities over their life span, while about 77% of currently identified bisexual and 64% of currently identified lesbians had changed identities. Using data from the National Survey of Midlife Development in the United States, Mock and Eibach (2012) found that while roughly 64% of non-heterosexual women changed identities from Time 1 to Time 2, ten years later, only 1.36% of heterosexual women changed identities.

The flexibility, or lack thereof, of pre-transition partners of male-to-female (MtF) or female-to-male (FtM) transsexuals is another interesting avenue by which to examine fluidity. In qualitative research utilizing semi-structured interviews, most of the natal women (who identified as lesbian, bisexual, or queer prior to their partner transitioning) in relationships with FtM transsexuals reported questioning or changing their sexual identities, although some also reported struggling to maintain their identities (Brown, 2009, 2010; Joslin-Roher & Wheeler, 2009). Theron and Collier (2013) described a slightly different pattern in which natal women in relationships with FtM transsexuals did not change their sexual identities, but these identities ranged from heterosexual to lesbian. In a sample of natal women in pre-transition relationships with MtF transsexuals, Aramburu Alegría (2013) reported that except for 3 women who ceased having a sexual relationship with their partners, the remaining 13 women began to question their

sexuality and sexual orientation – "the respondents believed they were heterosexual in their inherent preference for males as their sexual and relational partners, but also reported a need to identify their sexuality within the context of their reforming relationship" (p. 147).

As a whole, these data provide further evidence of women's sexual fluidity. Most of the natal women challenged or questioned their sexual identity within the context of a stable relationship. This occurred regardless of whether the relationship persisted or ended upon the partner's transition, although the majority of relationships remained intact. These results speak to Diamond's suggestion that women value the relationship over and above partner sex characteristics. As far as we know, there is no equivalent data on natal men's sexual identity and behavior fluidity in the context of a relationship with a transsexual partner, and thus it is unclear if natal men would exhibit a similar degree of fluidity as natal women, although we might expect that they would not, given other indicators of less fluidity in natal men. Lewins (2002) suggests that relationships in which the partner of a MtF or FtM transsexual is a natal female are more stable, and that this is a result of the natal female partner being socialized to value the relationship above physical characteristics of her partner.

The data reviewed thus far suggests a greater capacity for flexibility in women's sexuality. Cultural, situational, personal, historical, and relational factors exert their influence on women's sexual identities, behaviors, and attractions. Women express desire and attraction to both sexes more so than men. Despite stating a preference for specific erotic targets, women subjectively report finding some arousal value in their non-erotic targets. The pattern of women's weaker relationship between sexual orientation identity and subjective sexual interest can also be seen when examining objective measures of sexual interest.

**Category-specificity in genital arousal**

Chivers and colleagues conducted a series of studies finding that women evidenced significant physiological sexual arousal to stimuli featuring both their erotic and non-erotic targets, while men typically became physiologically aroused only when a sexual stimulus featured their erotic target. Chivers and Bailey (2005) showed heterosexual men and women videos of male-male, female-female, and male-female oral and penetrative sex, a video of bonobos (*Pan paniscus*) copulating, and neutral landscape and primate videos. Men became subjectively and physiologically sexually aroused to the female-female and female-male videos, but not to the neutral or bonobo videos, showing a category-specific pattern of arousal. In contrast, women became physiologically aroused to all human videos, and to a lesser extent, also to the bonobo videos, despite reporting greatest subjective sexual arousal to the male-female stimuli and no subjective arousal to the bonobo stimuli.

Given that the methods used to measure physiological arousal in men and women differ (i.e., penile plethysmography in men and vaginal photoplethysmography in women), it was unclear whether arousal patterns were genuinely different in men and women, or whether they were due to measurement artifacts. Chivers, Rieger, Latty, and Bailey (2004) thus measured the physiological arousal of a group of heterosexual and homosexual men and women, as well as a group of MtF transsexuals, while they viewed videos of male-male, female-female, and male-female oral and penetrative sex. The MtF transsexuals' genital arousal was measured using a vaginal photoplethysmograph, the same instrument used to measure natal women's genital arousal, inserted into surgically constructed neovaginas. MtF transsexuals showed a category-specific pattern of genital arousal similar to that of heterosexual and homosexual men. Women, however, evidenced a non-category-specific pattern, arousing to all stimuli regardless of whether or not it featured their erotic target. Providing a more detailed examination of these results in the

transsexual group, Lawrence, Latty, Chivers, and Bailey (2005) described that transsexuals who were attracted to men prior to their sex reassignment surgery (homosexual transsexuals) and those who were attracted to women prior to surgery (non-homosexual transsexuals) both displayed category-specific subjective and physiological arousal to their preferred erotic target. Chivers et al. (2004) and subsequent research thus demonstrated that gender differences in the category specificity of physiological arousal are likely to be genuine. This was later supported by Huberman and Chivers (2015), finding that genital responses to sexual stimuli were category-specific in men and non-category-specific in women when both plethysmography (a method that varies by gender) and thermography (a method that is the same for both genders) were used to measure genital responses.

In order to differentiate between the effects of actor gender and the intensity of the sexual activity depicted on men and women's divergent arousal patterns, Chivers, Seto, and Blanchard (2007) showed heterosexual and homosexual men and women videos of male-male, female-female, and male-female oral and penetrative sex, solitary male and female masturbation, a solitary nude man or woman exercising, bonobos copulating, and a neutral landscape. This array of stimuli thus included all combinations of erotic and non-erotic targets engaging in a variety of sexual activities varying in sexual intensity, including no sexual activity. Heterosexual and homosexual men exhibited higher subjective and physiological arousal to their preferred erotic target, and their sexual arousal increased as the explicitness of the sexual activity increased. Thus, their arousal varied as a function of the interaction between actor gender and activity explicitness. Women's arousal varied more as a function of the explicitness of the activity than the gender of the actor. Findings suggest that gender was a stronger determinant of men's physiological sexual arousal, whereas sexual explicitness was a stronger determinant of women's

physiological sexual arousal. Chivers and Timmers (2012) further tested whether category non-specificity could be also be found in heterosexual women if presented with stimuli that were even less intense than videos of masturbation and exercise. They presented heterosexual men and women with audio-only narratives describing sexual and non-sexual encounters with men or women. Yet again, women exhibited a non-category-specific pattern of physiological sexual arousal, whereas men exhibited a category-specific pattern of physiological sexual arousal.

As a follow-up to these studies Spape, Timmers, Yoon, Ponseti, and Chivers (2014) showed heterosexual men and women images of clothed men and women engaging in non-sexual activities, as well as images of non-aroused and aroused male and female genitals, all of which lacked contextual information (that is, scope of the images was limited to only the genitals, lower abdomen, and upper thighs) while simultaneously measuring subjective and genital arousal. Surprisingly, this was the first study in which heterosexual women exhibited a category-specific pattern of subjective and genital arousal to the stimuli featuring aroused male and female genitals. Spape and colleagues (2014) interpreted these results to mean that stimuli containing sexual context cues contribute to non-category-specific genital responses in women, whereas stimuli lacking in context contribute to more category-specific genital responses.

Consistent with Spape and colleagues' (2014) conclusions, Huberman, Maracle, and Chivers (2015) found that while men's self-reported attention to audiovisual sexual stimuli was category-specific and congruent with self-reported arousal and genital arousal, heterosexual women's self-reported attention to the stimuli were non-category-specific and congruent with genital arousal and self-reported arousal. Furthermore, self-reported attention significantly mediated the relationship between genital and self-reported arousal only for men, suggesting that attention plays a greater role in the category-specificity of men's sexual arousal than women's.

Several studies have also examined the extent to which within-gender differences in the category-specificity of women's genital arousal varies as a function of degree of self-reported attraction to men and women, independently of women's self-reported sexual identity (which may or may not align with sexual attraction). Findings generally suggest that women reporting any degree of attraction to women, regardless of self-identified sexual orientation, exhibit greater genital arousal to female sexual stimuli than male sexual stimuli, whereas women reporting exclusive attraction to men generally continue to exhibit non-category-specific genital arousal (Bouchard, Timmers, & Chivers, 2015; Chivers et al., 2007; Chivers et al., 2015; Suschinsky, Dawson, & Chivers, 2017; Timmers, Bouchard, & Chivers, 2015). In Chivers and colleagues' (2015) study, women's genital arousal to female sexual stimuli was similar regardless of degree of self-reported attraction to men or women, but women's genital arousal to male sexual stimuli decreased as a function of greater self-reported attraction to women. Bouchard and colleagues (2015) and Timmers and colleagues (2015) both found that women who endorsed some degree of bisexuality (whether in identity, behavior, attraction, or fantasy) exhibited significantly greater self-reported and genital arousal to female sexual stimuli than to male sexual stimuli. Suschinsky and colleagues (2017) similarly found that women's alignment of self-reported sexual attractions with their genital arousal was stronger in women reporting any degree of same-sex attraction than in women reporting exclusively opposite-sex attraction. Despite this recent evidence that some women may experience category-specific patterns of genital arousal – either aligning with or in opposition to their stated preferred erotic target – it is important to note that women's genital arousal remained much more non-category-specific than seen in men's patterns of genital arousal.

Rieger, Savin-Williams, Chivers, and Bailey (2016) hypothesized that the more category-specific genital arousal patterns typically seen in homosexual women may be related to their generally greater "masculinity" than is typically seen in heterosexual women. They examined the extent to which women's pattern of genital arousal was related to their having more or less masculine behaviors and characteristics. Homosexual women did not genitally arouse significantly more to female stimuli than did heterosexual women, but did genitally arouse significantly less to male stimuli than did heterosexual women. The variation in masculinity and femininity did not significantly vary between homosexual and heterosexual women, and in fact the relationship between sexual identity and genital arousal was strengthened when the variability of the effects of masculinity/femininity were removed. Furthermore, homosexual women with the greatest masculinity did not exhibit greater genital arousal to female stimuli than more feminine homosexual women or heterosexual women. Thus, they concluded that masculinity or femininity does not mediate or moderate the relationship between sexual orientation and genital arousal.

Bossio, Suschinsky, Puts, and Chivers (2014) examined the effect of menstrual cycle phase on the category specificity of women's subjective and genital arousal, hypothesizing that during ovulation when women are most fertile and show increased preferences for masculine features, category specificity toward their erotic target would increase. In two separate sessions, once during the follicular phase and once during the luteal phase, heterosexual women viewed videos of solitary male and female nude exercise, solitary male and female masturbation, oral and penetrative sex featuring either two women, two men, or one man and one woman, and neutral landscapes. Women displayed a non-category-specific pattern of physiological sexual

arousal regardless of cycle phase. This aligns with Dawson et al.'s (2012) findings that visual attention also remains non-category-specific in women regardless of cycle phase.

Pulverman, Hixon, and Meston (2015) recently criticized the statistical analytic techniques commonly used in research examining the category-specificity of genital arousal – comparing the average or maximum genital arousal between each set of erotic stimuli or comparing contrast/difference scores. They suggested that using a technique that utilizes all data points and models the data over time would be more sensitive and able to accurately capture category specificity. They assessed heterosexual women's genital arousal as they viewed erotic films featuring heterosexual, female-female, or male-male sexual activity. When data were analyzed using more traditional techniques, heterosexual women exhibited a non-category-specific pattern of genital sexual arousal; however, when analyzed using smoothing regression splines, heterosexual women exhibited greater genital arousal to the heterosexual film than to the other two films. They also examined the trajectory of genital arousal to each film and found that genital arousal increased linearly while viewing the heterosexual and male-male films, while arousal initially increased and then decreased when viewing the female-female film. Pulverman et al. (2015) also examined homosexual women's genital arousal to the three sets of films, finding that homosexual women's genital arousal was non-category-specific when data was analyzed using traditional methods, but that using smoothing regression splines revealed greater genital arousal to the heterosexual than to the male-male and female-female films. Homosexual women, though, did not exhibit uniform trajectories depending on film, and rather exhibited significant variation in the trajectory of their genital arousal to the films when examined within subjects.

Examining category specificity from another angle, Dawson and Chivers (2014) looked at heterosexual and homosexual men and women's desire to seek out either solitary or coupled sexual activity after viewing stimuli featuring their erotic or non-erotic targets. Participants viewed the same visual stimuli used in Chivers, Seto, and Blanchard (2007) and rated their desire to masturbate and to have sex with a partner before and after they viewed each film clip. Heterosexual men and homosexual men and women exhibited a category-specific response pattern, reporting increased desire for solitary and coupled sexual activity after viewing stimuli featuring their erotic targets. In contrast, heterosexual women's responses were less category-specific, reporting only a slightly increased desire for coupled sex, and no difference in desire for solitary sex, after viewing stimuli featuring their erotic versus non-erotic targets. All men and women reported increased desire for both solitary and coupled sex with increasing stimulus intensity.

**Evidence of category-specificity in pupillometry and visual attention**

Pupillometry, the examination of pupil dilation, provides a unique combination of visual attention and sexual arousal assessment. Findings of early studies examining pupil dilation to nude or semi-nude images of men and women are mixed. Some studies demonstrate category specificity in men and women's pupil dilation (e.g., Bernick, Kling, & Borowitz, 1971; Good & Levin, 1970; Hamel, 1974; Hess & Polt, 1960; Hess, Seltzer, & Shlien, 1965; Metalis & Hess, 1982; Simms, 1967; Watts, Holmes, Savin-Williams, & Rieger, 2017), some found a relatively non-specific pattern of pupil dilation in women (e.g., Attard-Johnson, Bindemann, & Ciardha, 2016; Rieger et al., 2015; Rieger & Savin-Williams, 2012; Schnelle, Kennedy, Rutledge, & Golden, Jr., 1974), while others found a lack of relationship between observer and image sex (e.g., Aboyoun & Dabbs, Jr., 1998; Garrett, Harrison, & Kelly, 1989; Green, Kraus, & Green,

1979; Scott, Wells, Wood, & Morgan, 1967). A review by Janisse (1973) concluded that pupil dilation was more related to the intensity of a stimulus rather than the valence of the stimulus. Bradley, Miccoli, Escrig, and Lang (2008) agreed, concluding that pupil diameter, mediated by increased activity of the sympathetic nervous system, increases in response to emotionally engaging stimuli, regardless of whether they are pleasant or unpleasant. Despite these mixed findings, more recent research with improved methods and newer technology has generally accepted pupil dilation as an objective indicator of sexual preference.

Laeng and Falkenberg (2007) examined pupillary responses in women as they viewed the faces of famous male actors (one of which was the face of the actor each participant reported to find most attractive), famous female actresses (one of which was the face of the actress each participant reported to find most attractive), well-known local celebrities that were of average attractiveness, and current boyfriends of the participant and other participants. Measurements were taken during each phase of the participant's cycle, or during time equivalents for women using hormonal contraceptives. Women using oral contraceptives showed an increase in pupil diameter when viewing their favorite actor, but did not show changes in average pupil diameter across the menstrual cycle. For naturally cycling women, the greatest increases in pupil diameter were during ovulation to images of their current boyfriend and their favorite actor. Also in naturally cycling women, regardless of menstrual phase, pupil diameter increased when viewing current boyfriend, favorite actor, and local celebrities; remained average when viewing other's favorite actors and others' boyfriends; and decreased when viewing own and others' favorite actresses. The authors interpreted this to mean that naturally cycling women, who have the capability of reproducing, exhibit increased interest in sexually relevant stimuli when fertile.

Laeng and Falkenberg's (2007) results converge with Rupp and Wallen's (2007) and Dawson et al.'s (2012) results in the domain of visual attention in that in all three studies, naturally cycling women exhibited increased responding/attention to reproductively relevant stimuli or parts of stimuli. They diverge, however, in that Laeng and Falkenberg's results indicate a more category-specific pattern of responding (increased pupil diameter to the erotic target) in naturally cycling women during ovulation, while Rupp and Wallen and Dawson and colleagues found no changes in category specificity between naturally cycling women and women taking OCTs, regardless of cycle phase.

Rieger and Savin-Williams (2012) sought to assess the validity of pupillometry as a measure of sexual orientation/arousal and to examine the relationship between pupil dilation, viewing time, and subjective measures of sexual interest. Hetero-, bi-, and homosexual men and women viewed 24, 30-second videos depicting either a nude man or nude woman masturbating, as well as two, 1-minute videos of neutral landscapes. Pupil dilation measures were obtained while participants viewed each stimulus video sequentially, providing ratings of sexual attractiveness, appeal, and desire to date. Amount of time spent viewing the male v. female stimuli was measured immediately after obtaining pupil dilation measures by showing the stimulus videos in pairs, each pair containing one male and one female; participants also chose for each pair whether they found the man or woman more attractive, more appealing, and which they would most like to date. In both men and women, pupils dilated more to their erotic target. Unlike in men, women's sexual orientation had a curvilinear effect on pupil dilation such that homosexual women showed an even greater category-specific response pattern than hetero- or bisexual women. Heterosexual men also had a more category-specific pattern of pupil dilation than did heterosexual women. Pupil dilation, viewing time, and subjective indicators of sexual

interest all correlated with each other and with sexual orientation, leading the authors to conclude that all three measures are valid indicators of sexual attraction and orientation.

Later, Rieger et al. (2015) examined the relationship between self-reported sexual orientation/attractions/fantasies, genital sexual arousal, subjective sexual arousal, and pupil dilation. They found that the correlations between sexual orientation and genital arousal, pupil dilation, and subjective sexual arousal were higher in men than women, mirroring previous research on genital/subjective concordance (Chivers et al., 2004, 2007). Heterosexual women's genital arousal and pupil dilation were equal to male and female stimuli, homosexual women's responses were somewhat more to female than male stimuli, and bisexual women's responses were in between heterosexual and homosexual women's responses, though these differences were not statistically significant. Rieger and colleagues (2016) also examined the extent to which sexual orientation and pupil dilation was influenced by women's masculinity/femininity. They found that homosexual women's pupils dilated more to female stimuli and less to male stimuli than did heterosexual women's, and thus homosexual women's pupil dilation was more category-specific than heterosexual women's. Women's masculinity or femininity did not influence the relationship between sexual orientation and pupil dilation.

Theoretical reviews, survey data of women's changes in sexual attractions, identities, and behaviors, and physiological measures of arousal all point to fluidity in women's sexuality not seen to the same extent in men. Hetero-, bi-, and homosexual women experience subjective and physiological arousal to both their erotic and non-erotic targets. It thus seems conceivable that women, regardless of orientation, would find images of other women sexually arousing and that this could partially explain why heterosexual women spend almost as much time viewing images of women as they do images of men.

Recently, Jones and Meana (2013) designed a study to test the impact of arousal on the viewing patterns of heterosexual women. It was hypothesized that if the women's sexual arousal were heightened, they would direct more of their attention to the stimulus that led to this heightened arousal. Two groups of heterosexual women were presented with the same slides used in Akhter et al. (2014), consisting of an image of a nude man on one side of the screen and a nude woman on the other side of the screen, while their gaze patterns were recorded unobtrusively using an eye-tracker. Prior to viewing the slideshow of erotic images, the women viewed either a 12-minute neutral landscape video (the no arousal induction group) or a 12-minute video depicting a heterosexual couple engaging in oral and penetrative sex (the arousal induction group). Although women in both groups attended more to the male images than to the female images, the aroused group were not more category-specific in their viewing pattern than the non-aroused group. That is, increasing women's sexual arousal did not appear to shift their attention more toward their erotic target.

Although increasing sexual arousal would be expected to shift women's attention away from their supposed non-erotic target and toward their preferred erotic target, these results do not rule out the possibility that images of women do have some arousal value for heterosexual women, which results in a more diffuse viewing pattern regardless of whether they are more or less aroused. This would align with Baumeister (2000) and Diamond's (2006) theories of erotic plasticity and sexual fluidity in women, whereby women report greater variation than men in their sexual behaviors and attractions, which align less stringently with their sexual orientation than they do in men. Thus, although identifying as heterosexual, women may still be attracted to and aroused by other women. This interpretation would also align with physiological measures of sexual arousal in which women genitally arouse to both their erotic and non-erotic targets. It

is also possible that the post-video erotic images in Jones and Meana (2013) were sufficiently arousing in and of themselves to wash out the arousal impact of the erotic video.

Alternately, women's relatively non-category-specific visual attention pattern may be unrelated to sexual arousal. After all, in the visual attention literature, increasing the arousal value of stimuli does not seem to alter the category specificity of women's visual attention and Lykins et al. (2008) found that women had a more diffuse gaze pattern than men even when viewing non-erotic photos. Although we know that experimentally aroused women in one study were no more category-specific than supposedly less sexually aroused women, the extent to which arousal fully or partially explains women's visual attention patterns to erotic stimuli remains unknown.

## The Social Comparison/Objectification Factor

As aforementioned, another possible explanation for heterosexual women's higher visual attention to same sex images relative to men's is that it is driven by appearance-focused social comparison and an objectifying gaze rather than by arousal. There is evidence that women engage in appearance-focused social comparison to a greater extent than do men and that social forces may have conspired to sexually objectify women even to themselves.

### Social Comparison

Social comparison theory was originally proposed by Festinger in 1954. Festinger theorized that people are driven to evaluate their own characteristics. When objective, non-social referents are unavailable, people will evaluate themselves by comparing to similar others, which can lead to changes in one's own self-evaluation and motivation to become more like, or better than, the similar others. People will be most driven to compare themselves to members of an important group, and on characteristics that are considered more relevant to a given situation.

It also appears that the greater the importance of comparison groups or characteristics the greater the pressure to conform to the group or to achieve certain ideals.

Many theorists have since expanded upon Festinger's (1954) original theory. Wheeler (1966) concluded that highly motivated individuals are more likely to engage in upward social comparisons – comparisons with others who are superior on the comparison trait – than individuals who are less motivated. Wills (1981) argued that individuals who perceive themselves as less than ideal will often compare themselves to others who are inferior (downward comparison) or to equals (lateral comparison) on the comparison trait in an effort to increase self-esteem. Buunk, Collins, Taylor, VanYperen, and Dakof (1990) found that both upward and downward comparisons can have positive and negative effects on the comparer. Taylor and Lobel (1989) summarized data supporting their argument that, under threat (for example, being rated as somewhat unattractive), different processes are involved in social comparison, namely choosing who to affiliate with (e.g., deciding to socialize with more attractive others), searching for information about others (e.g., what makes others more attractive), and explicit evaluation of the self against others (e.g., comparing one's own attractive features against those who are less attractive). Serving to motivate and enable a person to improve, affiliation and information is sought via upward comparisons, while explicit self-evaluation is sought via downward comparison, which serves to boost self-esteem. In contrast to Festinger's (1954) original conceptualization of social comparison, Wood (1989) emphasized that individuals are biased in their comparisons, seeking to meet certain goals such as self-evaluation, self-improvement, and self-enhancement. Helgeson and Mickelson (1995) expanded upon these goals, adding the goals of forming a common bond, altruism, and self-destruction. Thus, depending on the goal, an individual may choose to compare with similar or dissimilar

others, via upward, downward, or lateral comparison. Wood (1989) also observed that the environment can affect and create comparisons among individuals who might otherwise not serve as comparisons to each other.

For women, physical appearance may be the characteristic they are most driven to evaluate via social comparison, given the primary importance men place on appearance when choosing a mate (Buss & Shackelford, 2008) and the societal propagation of clearly defined beauty ideals (e.g., Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002; Rodin, Silberstein, & Striegel-Moore, 1984). Women are also encouraged by society (and perhaps biologically predisposed) to compete with each other in this domain, and indeed, women will commonly report automatically scanning their environment for other women and evaluating how they measure up to these women (Rodin et al., 1984), and generally report engaging in more appearance-focused social comparisons than do men (e.g., Franzoi et al., 2012). The pressure to succumb to uniform standards of beauty is undoubtedly high and fertile ground for social comparison.

**Objectification**

The societal emphasis on the physical appearance of women and the hypothesized effects of this emphasis led Fredrickson and Roberts (1997) to propose objectification theory. Therein, they posited that women's bodies are viewed as a "collection of body parts" (p. 174), separate from who they are as a whole person, functioning primarily for the utilization and enjoyment of others. In our predominantly heterosexual culture, men sexualize and evaluate women through visual examination (Calogero, 2004; Fredrickson & Roberts, 1997), viewing women's bodies as objects of their desire – thereby sexually objectifying them (Bartky, 1990; Moradi & Huang, 2008; Szymanski, Moffitt, & Carr, 2011). The awareness that one's own body is viewed as an

object can lead to an experience termed objectified body consciousness by McKinley and Hyde (1996). Women will monitor themselves to ensure they are meeting society's standards of beauty, which they are led to believe they can achieve only if they put forth sufficient effort. Eventually, women begin to see themselves as objects to be visually examined and evaluated – they begin to self-objectify (Fredrickson & Roberts, 1997). Purportedly, the more a woman has internalized these standards of beauty, the more likely she is to self-objectify (Moradi & Huang, 2008; Morry & Staska, 2001; Myers & Crowther, 2007).

Self-objectification has indeed been shown to be more pervasive among women than men. Huebner and Fredrickson (1999) asked men and women to recall and rate the percentage of their memories in which they took a first-person focus (recalled the event as if they were re-living it) versus observer focus (recalled the event as if they were watching it happen) and found that women reported a higher percentage of observer memories than men did, an indication that they may have self-objectified more than men. Strelan and Hargreaves (2005) found that in addition to women being more likely to self-objectify than men, they were also objectified, to a greater extent than men, by other women and men. In fact, women objectified other women more than they self-objectified. Additionally, in both men and women, greater self-objectification was linked with greater objectification of other men and women; the relationship between self- and other-objectification being stronger in women.

Bernard, Gervais, Allen, Campomizzi, and Klein (2012) examined the extent to which sexualized women and men were viewed as people (with body parts viewed in relation to each other) or as objects (with body parts viewed independently of each other). Men and women viewed individual photos of men and women wearing either a swimsuit or underwear, of which half were shown upright and half were shown inverted. Immediately after viewing each photo,

participants were presented with an image pair containing the previously viewed photo and a mirror image of the photo and asked to identify which they just saw. They found that participants were better at identifying upright men and women and inverted women than they did at identifying inverted men. Participants' ease in identifying inverted women and difficulty in identifying inverted men was interpreted to suggest that women were viewed as objects and men were viewed as people. Furthermore, the lack of gender differences in this effect led Bernard and colleagues to conclude that both men and women view women as sexual objects. Despite criticisms of their methodology (Tarr, 2013), additional studies have also provided empirical support for women being viewed as objects more than are men.

Further supporting this contention, Gervais, Vescio, and Allen (2012) showed men and women individual, full-body images of men and women, half of which were modified to be ideal (i.e., larger breasts and smaller waist-to-hip ratios in women, more muscular arms and higher chest-to-waist ratios in men) and half of which were modified to be average (i.e., smaller breasts and larger waist-to-hip ratios in women, thinner arms and lower chest-to-waist ratios in men). Participants were then presented with an image of a body only and asked to select the face (out of 12) that matched. They found that the error rate in both male and female participants was highest for both female body types and for the ideal male bodies. They concluded that this supported the fungibility hypothesis in which, when objectified, men and women's bodies are interchangeable as objects are, where one body can be substituted for another body of the same type. Thus, ideal and average women were objectified, whereas only ideal men were objectified.

In yet another study, Gervais, Vescio, Förster, Maass, and Suitner (2012) showed men and women individual, full-body images of men and women. After each image was presented, participants were asked to choose the image they just saw out of two possibilities – the original

image and the original image with a modified sexual body part (i.e., chest or waist). Furthermore, in the recognition task, half of the images contained only the target body parts, while the other half were presented in the context of the entire body. Women's body parts were better recognized when presented in isolation, while men's body parts were better recognized when presented in the context of the entire body. The authors concluded that women's bodies had been reduced to their parts, while men's were seen as an integrated whole.

Objectification theory (Fredrickson & Roberts, 1997) aligns well with a social comparison framework, with direct links between objectification and social comparison recently supported. Franzoi and Klaiber (2007) found that male and female college students, athletes, and models were most likely to compare themselves to similar others (i.e., students, athletes, and models compared themselves most frequently with other students, athletes, and models, respectively), aligning with Festinger's hypothesis that people more frequently compare with similar others. However, they also found that college women were more likely than college men to compare themselves to models when specifically evaluating their weight and sexual attractiveness. Women more frequently engage in bodily social comparison to TV and magazine models than do men (Sohn, 2009). Results of an online survey of women attending women-only or mixed-sex colleges suggest that in both settings, social comparison of one's physical appearance is positively correlated with self-objectification (Spencer, Barrett, Storti, and Cole, 2013). Lindner, Tantleff-Dunn, and Jentsch (2012) tested a theoretical model in which self-objectification, other-objectification, and social comparison interact in a continuous cycle. The best fitting model indicated that self-objectification and objectification of others were related ($r$ = .66) and these constructs were both related to social comparison ($r$ = .39 and $r$ = .48, respectively). They hypothesized that self-objectification leads women to question whether their

appearance aligns with or deviates from standardized beauty ideals in comparison to others' appearances. Women must then seek out other women to objectify in order to compare their objectified appearance features. Self- and other-objectification thus leads to social comparison, which then leads to further self- and other-objectification.

As we might expect, self-objectification, social comparison, and thin-ideal internalization often lead to negative affect. Miner-Rubino, Twenge, and Fredrickson (2002) found that greater self-objectification was associated with greater body shame and depression in women. In Jones's (2002) study, 7th and 10th grade boys and girls who reported greater frequency of social comparison to models and peers also reported greater body dissatisfaction, with the highest correlations being among girls who compared their weight and body shape. In a diary study measuring the frequency of upward or downward body shape/weight comparisons in women scoring high or low on body dissatisfaction, and their mood reactions following comparisons, women with high body dissatisfaction engaged in more frequent appearance-focused comparisons, a greater proportion of which were upward comparisons, than women with low body dissatisfaction (Leahey, Crowther, & Mickelson, 2007). Furthermore, upward comparisons led to more negative affect, while downward comparisons led to more positive affect. In a meta-analysis examining the relationship between social comparison and body dissatisfaction, Myers and Crowther (2009) found social comparison to be associated with higher levels of body dissatisfaction, an effect that was stronger in women than in men. In women with greater internalization of the thin ideal, appearance-focused upward comparisons were related to body image dissatisfaction (Myers, Ridolfi, Crowther, & Ciesla, 2012). Finally, Fitzsimmons-Craft et al. (2012) found that self-objectification mediated the relationship between internalization of the

thin ideal and body dissatisfaction such that self-objectification may prompt women to notice discrepancies between their actual bodies and their ideal bodies, leading to dissatisfaction..

**Influence of objectification, comparison, thin ideal internalization, and body dissatisfaction on visual attention**

Objectification, social comparison, internalization of the thin ideal, and body dissatisfaction have also been shown to affect visual attention patterns. Preferential viewing of women's bodies as compared to faces is thought to be an indicator of an objectifying gaze pattern wherein body parts are focused on at the expense of the face, which is seen as the more humanizing and individuating element of a person's photograph (Bartky, 1990; Fredrickson & Roberts, 1997). Holland and Haslam (2013) showed men and women images of thin or overweight women wearing either lingerie or full clothing while they completed a dot probe task measuring attention to bodies as compared to faces. The bodies of thin women or women wearing lingerie were attended to by both men and women more than overweight or fully-clothed women, which Holland and Haslam interpreted as a greater objectification of thin or scantily clad women. Similarly, when viewing photographs of clothed women that were modified to represent a high ideal body shape (i.e., larger breasts and lower waist-to-hip ratios), average ideal body shape, or low ideal body shape (i.e., smaller breasts and higher waist-to-hip ratios), men and women spent more time viewing breasts and waists and less time viewing faces when asked to evaluate the models' appearance than they did when asked to evaluate the models' personality (Gervais, Holland, & Dodd, 2013). This pattern was especially salient when viewing high ideal as compared to average or low ideal bodies. Also when asked to focus on appearance, faces and waists of high and average ideal bodies were fixated on more quickly, especially for male viewers, than when asked to focus on personality, which led to quicker fixations only on

faces. They concluded that men and women are more likely to display an objectifying gaze when they are focused on appearance or when they are viewing women with culturally ideal body shapes.

Fashion advertisements depicting images of ideal models are perfect breeding grounds for social comparison. The ads are created for the purpose of demonstrating just how much more attractive, desirable, happy, etc. a woman could be if she bought the advertised product. Indeed research has shown that women fixate more frequently on, and view for a longer period, the model in an advertisement than the headline or product (Ju & Johnson, 2010). Furthermore, in Ju and Johnson's sample, visual attention to the model, self-reported social comparison, and internalization of the thin ideal were all positively correlated. Mischner, van Schie, and Engels (2013) examined women's visual attention to appearance-related product advertisements featuring a thin model after either being informed about the advantages of conforming to the thin ideal (norms confirmed group), disadvantages of conforming to the thin ideal (norms challenged group), or receiving no information about the thin ideal. Women in the norms confirmed group spent more time viewing the model in the advertisements than did women in the norms challenged group, suggesting that encouragement to internalize the thin ideal may motivate women to seek out information for self-improvement via upward social comparison. Attention paid to the appearance-related advertisements as a whole also varied as a function of self-esteem. Women with low self-esteem spent more time viewing the advertisements when norms were confirmed or no information was given and less time viewing the advertisements when norms were challenged than women with high self-esteem, indicating that self-esteem may also influence women's motivation to attend to supposedly appearance-improving information (Mischner et al., 2013).

Given that low self-esteem is positively related to dissatisfaction with one's body shape in both men and women (e.g., McArdle & Hill, 2009; Svaldi, Zimmermann, & Naumann, 2012; Yean et al., 2013), we might also expect to find a relationship between body dissatisfaction and visual attention. Research on the nature of this relationship, however, is mixed. Janelle, Hausenblas, Ellis, Coombes, and Duley (2009) found that higher levels of body dissatisfaction were related to *less* time spent viewing one's own body and the body regions of a model that are typically associated with body dissatisfaction (i.e., chest, stomach, pelvis). In contrast, Horndasch et al. (2012) found that adolescent girls viewing photos of women in underwear or bathing suits allocated *more* attention to body parts frequently implicated in body dissatisfaction (i.e., stomach, hips, buttocks, and thighs) than other body parts, and girls with eating disorders attended more than non-disordered girls to unclothed body parts. In adult samples of women viewing the bodies of other models, women with disordered eating focused more on low-BMI models whereas asymptomatic women focused relatively equally on high- and low- BMI models (Blechert, Nickert, Psych, Caffier, Mat, & Tuschen-Caffier, 2009). Likewise, eating disorder symptomatic women focused more on models' attractive rather than unattractive parts, while asymptomatic women focused more on models' unattractive rather than attractive parts (Jansen, Nederkoom, & Mulkens, 2005). This pattern was reversed when eating disorder symptomatic women viewed their own bodies – symptomatic women focused more on body parts they found unattractive whereas asymptomatic women focused either equally on attractive and unattractive body parts (Tuschen-Caffier, Bender, Caffier, Klenner, Braks, & Svaldi, 2015) or focused more on the body parts they found attractive (Jansen et al., 2005). Similarly, Roefs et al. (2008) found that women with higher BMIs and women who rated their own bodies as unattractive spent more time viewing the part of their body they rated as the least attractive than they did viewing other

parts of their body. In contrast, they spent more time viewing the part of an average looking control body that they rated most attractive.

Cho and Lee (2013) presented men and women, scoring either high or low on measures of body dissatisfaction, computer generated images of same-sex, partially clothed bodies. Each stimulus presentation was composed of an image of a thin, normal, muscular, and fat body in each quadrant. Men with high body dissatisfaction spent more time viewing muscular bodies than normal, thin, or fat bodies, and spent more time viewing muscular bodies than men with low body dissatisfaction. Similarly, women with high body dissatisfaction spent more time viewing thin bodies than normal, muscular, or fat bodies, and spent more time viewing thin bodies than women with low body dissatisfaction. Thus, men and women with greater body dissatisfaction spent more time viewing idealized body types. This contrasts with previous findings from Glauert, Rhodes, Fink, and Grammer (2010) who found that women with lower BMI and lower body dissatisfaction spent more time viewing thin bodies.

Lykins, Ferris, and Graham (2014) and Cundall and Guo (2017) examined the influence of women's self-assessment of their own body parts on viewing of others' body parts. Lykins and colleagues (2014) found that for the two body regions female participants rated as being most concerning (mid and lower torso), lower satisfaction was related to less visual attention, while greater satisfaction was related to more visual attention to these body regions on images of both thin and plus-size female models, thus possibly preserving self-esteem by avoiding attending to areas with which one is dissatisfied. In contrast, Cundall and Guo (2017) found that women's satisfaction with their own body regions was negatively correlated with viewing of those regions on images of fully-clothed female bodies. They interpreted this to mean that satisfaction with a part of one's own body decreases the need to compare that body part to that of

another's. However, Cundall and Guo (2017) also found that women's own breast size was positively correlated with viewing the upper-body of female images, and thus perhaps women with smaller breasts avoid viewing other women's chests to preserve self-esteem and/or women with larger breasts seek out viewing other women's chests to promote self-esteem, engaging in less upward comparison and allowing for more downward appearance comparisons. The reverse relationship was found between women's own body mass index (BMI)/dress size and viewing of the lower bodies of the female images they rated as more attractive, thus engaging in upward comparison. They hypothesized the discrepancy may be due to the greater changeability of one's own BMI than one's own breast size, and thus upward comparison is more likely to occur for body regions women may self-improve upon.

While more recent data is mixed, these studies collectively demonstrate that body dissatisfaction is generally associated with increased attention to one's own perceived-to-be less attractive body parts and increased attention to others' more attractive body parts, conceivably for the purpose of comparing how discrepant one's dissatisfactory body parts are from those of ideal others. More generally, though, the literature supports that women are objectified and self-objectify more than men, leading them to engage in more appearance-focused social comparisons. Although social comparison can lead to positive feelings at times, it can also lead women to feel badly about their appearance and lower their mood. Objectification, social comparison, internalization of the thin ideal, and body dissatisfaction/esteem also clearly interact in complex ways to influence women's visual attention patterns to both themselves and other women. There has been no research to date examining if or how these variables relate to differential viewing patterns when simultaneously presented with images of men and women, either erotic or non-erotic. Given their higher propensity for self- and other-objectification and

comparison, it seems plausible that heterosexual women would spend a significant amount of time viewing images of other women for the purpose of social comparison, even in the presence of competing images of their supposed erotic targets – men.

## The Erotic Self-Focus Factor

One potential extension of self-objectification is self-eroticization. If women are accustomed to seeing themselves as objects of desire and are frequently evaluating their own desirability, it would seem theoretically plausible to posit that these processes might result in self-arousal. Some recent literature is starting to consider this possibility.

### Object of desire self-consciousness

Object of desire self-consciousness theory (Bogaert & Brotto, 2014) has recently been proposed as an expansion of sexual objectification (Bartky, 1990; Moradi & Huang, 2008; Szymanski, et al., 2011) and objectified body consciousness (McKinley & Hyde, 1996) theories. Object of desire self-consciousness (ODSC) is defined as "the perception that one is romantically and sexually desirable in another's eyes" (p. 1), and thus integrates an awareness of being perceived by another specifically as an object of desire, as well as an evaluation of the self as an object of desire. Bogaert and Brotto (2014) hypothesized that ODSC is particularly defining of heterosexual women's romantic and sexual experience. Indeed, women have more frequently reported ODSC themes in their sexual fantasies than men, assessed via a sexual fantasy questionnaire, forced-choice sentence completion involving sexual scenarios, and open-ended descriptions of sexual fantasies (Bogaert, Pozzebon, Visser, & Orlowski, 2009, as cited in Bogaert & Brotto, 2014; Bogaert, Visser, & Pozzebon, 2015).

Despite the oft-cited negative consequences of being sexually objectified (for a review see Moradi & Huang, 2008), an extensive body of research indicates that many women also

derive sexual pleasure from being objects of desire (Meana, 2010). Women participating in in-depth interviews (Brotto, Heiman, & Tolman, 2009) and focus groups (Graham, Sanders, Milhausen, & McBride, 2004) reported that feeling desired by their partner positively influenced their own levels of sexual desire and arousal. A group of sexually healthy women completing McCall and Meston's (2006) Cues for Sexual Desire Scale reported that they were very likely to desire sexual activity after having a partner express that he or she had fantasized about them. When asked to specify their motives for sexually teasing members of the opposite sex, men and women's first and second most frequently endorsed responses were to make the other person sexually desire them (reported in 69% of the women and 58% of the men), and to see how much the other person wanted them (56.8% in women, 54.8% in men; Meston & O'Sullivan, 2007). Gender differences emerged for women's third most frequently endorsed response – to make themselves feel attractive or desirable – with 51.8% of women offering this as a reason and only 27.4% of men doing so. Being sexually desired by another clearly emerges as an important and integral component of women's sexuality.

**Self as desirable in women's sexual fantasies**

The content of women's sexual fantasies reflects this desire to be desired, with many women engaging in fantasies such as "being seduced," "seducing partner," "delighting many men," "being an irresistibly sexy female," and being "a striptease dancer, harem girl, or other performer" (Hariton & Singer, 1974; Hsu et al, 1994; Strassberg & Lockerd, 1998; Sue, 1979). While men fantasize most about the visual characteristics of their partner, as well as giving their partner pleasure, the partner's role in women's fantasies appears largely to reflect her own desirability (Ellis & Symons, 1990; Meana, 2010; Zurbriggen & Yost, 2004). Perhaps one of the most striking ways in which this manifests is the prominence with which being overpowered by

a partner whose desire is unstoppable – so-called “rape” fantasies – features in women’s sexual fantasies.

Although men also fantasize about submitting to another (Hsu et al., 1994; Person, Terestman, Myers, Goldberg, & Salvadori, 1989; Zurbriggen & Yost, 2004) and being desired by another (Janssen, McBride, Yarber, Hill, & Butler, 2008; Sue, 1979), the theme is much more prominent in women’s fantasies. In their review of the literature on sexual fantasies, Leitenberg and Henning (1995) found that submission fantasies were more common in women, whereas dominance fantasies were more common in men. In groups of predominantly single (Strassberg & Lockerd, 1998) and married (Hariton & Singer, 1974) women, over 50% reported engaging in fantasies in which they were forced into sexual submission. In a recent review of rape fantasies, Critelli and Bivona (2008) estimated that between 31% and 57% of women have had rape fantasies.

Bivona, Critelli, and Clark (2012) sought to empirically evaluate the three dominant theories that have emerged in attempts to explain why women commonly fantasize about a scenario that would most certainly be abhorrent were it to happen in real life: 1) to avoid blame or guilt that may arise from having a consensual sexual fantasy, 2) that rape fantasies are a result of being sexually open and accepting, and 3) that rape fantasies represent the epitome of being desired – the woman is so sexually arousing that the other person cannot possibly resist her, taking her by force if necessary. Evidence did not support the blame avoidance theory. The most strongly supported theory was openness to sexual experience, with variables such as positive sexual attitudes, openness to fantasy experiences, and having frequent consensual fantasies positively correlating with frequency of rape fantasies. The desirability theory also received moderate support, with women with higher self-esteem and frequency of having non-

coercive fantasies about being desirable (such as performing as a stripper) reporting more frequent rape fantasies.

In fantasizing about being the object of desire, the focus is necessarily on the self – "I am desired" as compared to "I desire my partner." Women's self-focus as desired sexual objects naturally extends to another aspect of women's lived and fantasy sexual experiences – they tend to turn the focus inward on their own pleasure and feelings, rather than their partners' (Ellis & Symons, 1990; Graham et al., 2004; Zurbriggen & Yost, 2004). This lies in contrast to men, who tend to have an outward, visually dominated focus on their partner, with a lesser self-focus (Ellis & Symons, 1990; Janssen et al., 2008; Zurbriggen & Yost, 2004). Men are more likely to imagine themselves in an active, proceptive role in which they are pleasuring their partner, whereas women are more likely to imagine themselves in a passive, receptive role in which their partner is pleasuring them (Leitenberg & Henning, 1995; Wilson & Lang, 1981; Zurbriggen & Yost, 2004). Studies using auditory descriptions of erotic scenarios have found that descriptions that were focused on female, rather than male, pleasure led to greater genital (Heiman, 1977) and subjective (Laan, Everaerd, van Bellen, & Hanewald, 1994) arousal in women.

Just as a woman's focus on her own physical pleasure can facilitate arousal (e.g., Brody & Weiss, 2010; Brotto, 2013; de Jong, 2009; Meston, 2006), a positive focus on or appraisal of her own body and appearance can also facilitate arousal (e.g., Graham et al., 2004; Koch, Mansfield, Thurau, & Carey, 2005; Trapnell, Meston, & Gorzalka, 1997). In Graham et al.'s (2004) interviews with women, many mentioned that feeling comfortable and confident about their own appearance and body enhanced their sexual arousal. Survey studies have found that self-perceived attractiveness (Koch et al., 2005), body appreciation (Satinsky, Reece, Dennis, Sanders, & Bardzell, 2012), body esteem (Seal, Bradford, & Meston, 2009), and satisfaction with

one's body image (Ackard, Kearney-Cooke, & Peterson, 2000) are positively related to increased sexual desire, sexual pleasure, sexual satisfaction, orgasm, and frequency of sex in women. In their review of extant literature on body image and female sexual functioning, Woertman and van den Brink (2012) point out that given the largely correlational nature of existing research and the wide variety of measures used to assess body image and sexuality, the exact nature of the relationship between the two is not well understood; however, they conclude that body satisfaction is likely to directly influence many aspects of women's sexuality. Although men also report that feeling good about their body and appearance serves to enhance their arousal (Janssen et al., 2008), research on this relationship has generally been dedicated to women. Given the greater objectification of women and the importance of appearance in the sexual evaluation of women, it would not be surprising to find that women's assessment of their own body and attractiveness influences their sexuality to a greater extent than men's.

**Self-focus as a source of desire**

The idea of self-focus as potentially erotic for women is conceptually related to autogynephilia (attraction to one's womanhood), a term coined by Blanchard (1989a) to refer to a type of paraphilia evident in a supposed sub-type of male-to-female transsexuals who report sexual arousal to the thought and performance of being a woman. Although Blanchard (2005) contends that autogynephilia does not exist in natal women, the process by which autogynephilic MtF transsexuals "become" the objects of their attraction via fantasizing about being a woman, cross-dressing, sex reassignment surgery, etc. is similar to processes in which women fantasize about achieving sociocultural ideals of beauty and strive to achieve those ideals by dressing themselves and otherwise altering their appearance to "become" their ideal.

To investigate the possibility that elements of autogynephilia may also be present in natal women, Moser (2009) created a Female Autogynephilia Scale based on scales used by Blanchard (1985, 1989b) to assess autogynephilia in MtF transsexuals. Twenty-nine adult women, 90% of whom identified as heterosexual, were surveyed about the frequency with which they experienced arousal to a variety of thoughts and behaviors thought to reflect autogynephilia, such as "I have been erotically aroused by contemplating myself in the nude," and "I have been erotically aroused by preparing (shaving my legs, applying make-up, etc.) for a romantic evening or when hoping to meet a sex partner" (p. 543). Ninety-three percent of the women endorsed occasionally or frequently experiencing arousal in at least one of the scenarios listed, leading Moser to conclude that autogynephilia is not exclusive to a sub-type of MtF transsexuals, but can be detected in natal women as well. Moser's scale has been criticized by Lawrence (2010) as only being superficially related to autogynephilia and missing the mark in assessing the core feature of autogynephilia – arousal to the self as a woman as <u>the</u> primary arousal. While Moser's work may not have tapped into an experience whereby women become sexually aroused simply because they possess female characteristics, he certainly highlights the presence of some kind of arousing and erotic self-focus in women, a sort of sexual self-eroticization.

Recently, Meana and Fertel (2016) sought to explore the existence of erotic self-focus in a large sample of men and women by administering a questionnaire designed to measure the extent to which men and women have engaged in and found arousal value in self-focused experiences and the extent to which they believed the overall concept of erotic self-focus was related to men and women's sexuality. Overall, women reported a much greater erotic self-focus than did men, and both men and women endorsed the belief that erotic self-focus was more prevalent in women than in men.

These intriguing results indicate that women may be their own erotic objects to an extent not evidenced in men. Women report increased awareness of their own desirability as a sexual object, greater focus during sexual fantasy on being desired, and a greater focus on receiving sexual pleasure. There is some preliminary, empirical evidence to suggest that women's sexual arousal may be derived in part from their own feelings of being desirable consequent to a self-focus on their own erotic value as feminine and sexy beings. Similarly to the way that self- and other-objectification are related, women with a greater erotic self-focus may by extension have a greater focus on other women depicted in visual sexual stimuli, also focusing on their desirability and femininity.

## The Empathy/Identification Factor

We have considered sexual fluidity and the attendant arousal value of women for heterosexual women, social comparison/objectification, and erotic self-focus as factors possibly related to heterosexual women's visual attention to same-sex images, but there may be one other factor to consider; women's greater empathy/identification orientation.

Early reviews of the empathy literature suggested that women are more empathic than men (Hoffman, 1977), particularly in studies using self-report measures (Eisenberg & Lennon, 1983). More recent research examining both affective (feeling another's emotions) and cognitive (awareness and understanding of another's emotions) components of empathy have found that this sex difference is particularly salient for affective empathy (e.g., Carré, Stefaniak, D'Ambrosio, Bensalah, & Besche-Richard, 2013; Grynberg, Luminet, Corneille, Grèzes, & Berthoz, 2010; Laurent & Hodges, 2009; Van der Graaff et al., 2014). That is, women appear more likely than men to experience an emotional response to others' emotions. Hoffman (1977) hypothesized that affective empathy is more easily elicited in women than in men because

women are more likely to identify with others and to try to imagine how others feel. This effect extends not only to perceptions of others' emotions in reality, but to perceptions of fictional characters as well (e.g., Davis, 1980; Grynberg et al., 2010; Laurent & Hodges, 2009).

Women may also be more likely than men to empathically engage and identify with actors in sexually explicit erotic material, which is indeed what Money and Ehrhardt (1972) hypothesized: A heterosexual man views a woman in the scene as a sexual object, focusing his visual attention on her, and imagining that he is having sex with her. A heterosexual woman views a woman in the scene and empathizes and projectively identifies with her, imagining that what is happening to the woman is actually happening to her; instead of the woman in the scene being the object of the man's desire, the viewer imagines *she* is the object of the man's desire. After showing a group of men and women a 10-minute film of either a man or woman masturbating, and asking them to create a fantasy based on the video, women, but not men, included more elaborate erotic content in their fantasies after viewing a same-sex film (Abramson & Mosher, 1979). Abramson and Mosher (1979) interpreted this as an indication that women engaged in more positive projective identification with the same-sex actor than men did, reaching a conclusion similar to Mosher and Abramson (1977) after finding that women subjectively reported becoming sexually aroused to a video of a same-sex actor masturbating, while men did not.

In an attempt to more directly measure projective identification, a number of researchers have examined the influence of observational stance (i.e., viewing a stimulus as either a participant in the scene or an observer of the scene) and the similar construct of emotional absorption (i.e., the degree to which a person feels as though they are a part of the scene). The relationship between projective identification and physiological arousal is mixed. Men in

Koukounas and Over (2001) and Bossio, Spape, Lykins, and Chivers (2014) evidenced greater physiological arousal when instructed to view an erotic video as a participant than when asked to view as an observer. Men's physiological arousal was also positively related to absorption in the stimulus (Koukounas & McCabe, 2001; Koukounas & Over, 1993, 1997). In contrast, instructions to adopt a participant vs. observer stance did not relate to men or women's physiological arousal as reported by Both, Laan, and Everaerd (2011). Bossio and colleagues (2014) also found that observational stance was unrelated to women's physiological arousal.

Research largely suggests that taking a participant, rather than observer, stance when viewing erotic material and higher reported levels of absorption are related to increased subjective sexual arousal in men and women, both when simply examining how these constructs correlate to arousal (Koukounas & McCabe, 1997, 2001; Koukounas & Over, 1993,1997), and when specifically instructing participants to adopt a particular stance (Both et al., 2011; Koukounas & Over, 2001; Sheen & Koukounas, 2009). However, Janssen, Carpenter, and Graham (2003) found that men's subjective sexual arousal to a series of erotic film clips was related to taking both an observer and participant stance, whereas only the latter was predictive of women's subjective arousal to the clips. The opposite was found by Bossio et al. (2014) in that men's subjective arousal was related to taking a participant stance, whereas both an observer and participant stance was related to women's subjective arousal.

Women have reported more absorption than men when instructed to take an observer stance (Both et al., 2011), suggesting that women may naturally be more inclined to project themselves into a stimulus than men, or may have a more difficult time than men adopting a purely observational stance. Women have also shown a preference for viewing photos in which the female actor's body is more clearly displayed, and have rated photos in which the female

actor had an indirect, rather than direct gaze as more attractive (Rupp & Wallen, 2009). This may reflect a preference for stimuli in which women can more easily imagine that they are the woman in the scene. Janssen et al. (2003) also hypothesized that a heterosexual man can attend to and become aroused by a female actor independently of imagining that he is a participant in the sexual scenario whereas, for a heterosexual woman, imagining herself as a participant is integral to becoming sexually aroused when viewing a female actor.

Women's identification also emerges in the way they connect with erotic visual material – by imagining that they are a part of the sexual scenario. It thus seems reasonable to speculate that another possible reason why heterosexual women may spend almost as much time viewing a female actor as a male actor is that they are empathically engaging and identifying with her, projecting themselves into the scene and imagining that what is being done to the female actor is being done to them.

# CHAPTER 3

# AIMS OF THE STUDY

A clear pattern has emerged in the literature whereby heterosexual men allocate most of their visual attention to their erotic target (women) when viewing a sexual stimulus, while heterosexual women divide their attention more equally between their erotic and non-erotic targets (men and women, respectively). A number of interpretations for women's more diffuse visual attention patterns to erotic stimuli have been proposed, most of which have not been tested empirically. This study attempted to determine the extent to which erotic plasticity, appearance-focused social comparison/objectification, erotic self-focus, and empathic identification can account for women's visual attention to erotic stimuli. A number of measures assessing each construct were administered and their relationships with visual attention patterns, captured using an eye-tracker, were examined.

One possibility was that female images contain some arousal value even for heterosexual women as a function of their greater erotic plasticity. In the present study, sexual plasticity was measured using a scale designed to assess both behavioral and cognitive/affective dimensions of orientation along a continuum, allowing for examination of more subtle variations in women's sexual fluidity than can be assessed with simple forced-choice categorization measures; participants were also asked to rate their sexual arousal to the male and female images. Another possibility was that women are looking at women because they are engaging in appearance-focused social comparison and objectification, which was assessed using scales measuring self-objectification, body esteem, and upward and downward appearance comparisons. The third potential explanation involving the premise that women's attention to women is an extension of an erotic self-focus was investigated via measures of object of desire self-consciousness and

erotic self-focus. Finally, the possibility that heterosexual women are viewing images of women as part of a greater empathy orientation and projective identification with the female actor was assessed via a measure of emotional and cognitive empathy, as well as items modeled after those in Janssen et al. (2003) and Bossio et al. (2014) asking participants the extent to which they adopted a participant or observer point of view and the extent to which they identified with the male and female actor.

Although we proposed that these constructs are theoretically related to women's visual attention to images of women, there is little empirical evidence to suggest how they may specifically interact or differentially contribute to visual attention patterns. The nature of this correlational study was thus largely exploratory.

# CHAPTER 4

# METHODOLOGY

## Participants

Participants consisted of heterosexual women who were recruited primarily from introductory psychology courses via an advertisement on the University of Nevada, Las Vegas SonaSystems website. Participants received one-and-a- half research credits for participation. All participants were required to be over 21-years-old, self-identify as heterosexual, and have normal or corrected-to-normal vision (i.e., normal vision with contacts or glasses).

A total of 152 women participated in the study, yielding a final sample of 117 participants who completed all components of the study and produced valid eye-tracking data. One participant was excluded as she did not complete the online measures. Additionally, 34 participants were excluded due to either experimenter error or difficulty with calibration leading to inability to collect valid eye-tracking data. Sociodemographic characteristics of the final sample (N = 117) are presented in Table 1.

*Table 1. Participant Sociodemographic Characteristics*

| Age | M | SD |
|---|---|---|
| | 24.32 | 5.91 |
| | n | % |
| Ethnicity | | |
| Caucasian | 39 | 33.3 |
| Hispanic | 36 | 30.8 |
| Asian | 17 | 14.5 |
| Other/Mixed | 15 | 12.9 |
| African American | 10 | 8.5 |
| Religious Affiliation | | |
| None | 45 | 38.5 |
| Catholic | 33 | 28.2 |
| Christian | 29 | 24.8 |
| Other | 8 | 6.8 |
| Jewish | 1 | 0.9 |
| Muslim | 1 | 0.9 |
| Education Completed | | |
| High school degree | 8 | 6.8 |
| Some college | 68 | 58.1 |
| Associate's degree | 29 | 24.8 |
| Bachelor's degree | 8 | 6.8 |
| Some graduate school | 4 | 3.5 |
| Relationship Status | | |
| Single, not dating | 37 | 31.6 |
| Single, dating | 17 | 14.5 |
| Committed relationship, not cohabiting | 34 | 29.1 |
| Committed relationship, cohabiting | 19 | 16.2 |
| Married | 10 | 8.5 |
| Using Hormonal Contraceptive | | |
| Yes | 78 | 66.7 |
| No | 39 | 33.3 |

## Measures

Two types of measures were utilized and are described below: 1) measures of visual attention and interest assessed via eye-tracking methodology, and 2) self-report instruments, which yielded information on sociodemographic characteristics and other constructs of interest to this study – sexual fluidity, appearance-focused social comparison, body esteem, self-objectification, object of desire self-consciousness, erotic self-focus, and empathy.

### Visual Attention Measures

**Total gaze time.** Total gaze time, a measure of the total amount of time a participant spends looking in each area of interest, was measured using eye-tracking methodology (see apparatus and procedure sections for technical details). In eye-tracking research, total gaze time is commonly taken to be an indication of interest as it seems that we would logically spend more time attending to stimuli that capture our interest (Henderson & Hollingworth, 1999). Each participant's total gaze time was captured (in milliseconds) for each scene region (male image and female image) within each slide (a total of 12 slides). These data were then averaged across slides per participant, yielding a mean total gaze time for the male images and for the female images for each participant. Difference scores were also obtained for each participant by subtracting the mean total gaze time for the female images from the mean total gaze time for the male images. Positive difference scores indicate greater viewing time of the male images and negative difference scores indicate greater viewing time of the female images.

**Number of fixations.** Number of fixations, a measure of the total number of distinct fixations on each scene region, is also commonly interpreted to be an indication of interest. Specifically, the number of fixations is related to the informativeness of the scene region, with more fixations indicating a greater level of relevant information (Henderson & Hollingworth,

1999). Each participant's number of fixations were totaled for each scene region within each slide. These data were then averaged across slides per participant, yielding a mean total number of fixations for the male images and for the female images for each participant. Difference scores were also obtained for each participant by subtracting the mean total number of fixations for the female images from the mean total gaze time for the male images. Positive difference scores indicate greater number of fixations on the male images and negative difference scores indicate greater number of fixations on the female images.

**Self-Report Measures**

**Multidimensional Scale of Sexuality (MSS; Berkey, Perelman-Hall, & Kurdek, 1990; Appendix A).** The MSS was used to measure behavioral and cognitive/affective dimensions of sexual orientation. The MSS is a 45-item true/false scale designed to measure heterosexual, homosexual, and asexual orientations, as well as six categories of bisexuality. The scale consists of items related to sexual attractions, fantasies, behaviors, arousal to erotica, and emotional attractions. For each sexual orientation category, the behavior subscore is determined by the single behavior item and the cognitive/affective subscore is obtained by averaging the other four items. The subscores range from 0-1, with higher scores indicating greater endorsement of items for each sexual orientation category. In the current study, cognitive/affective scores on the three bisexual categories (i.e., heterosexual with some homosexuality, concurrent bisexual, and sequential bisexual) were utilized. The MSS has shown adequate internal consistency, with Cronbach's alpha coefficients ranging from .63 to .87 (Berkey, Perelman-Hall, & Kurdek, 1990). In the current study, Cronbach's alpha coefficients for the three bisexual categories ranged from .52 to .63.

**Objectified Body Consciousness Scale (OBCS; McKinley & Hyde, 1996; Appendix B)**. The OBCS is a 21-item self-report questionnaire measuring the extent to which women have internalized cultural ideals of body appearance, and thus begun to view their own bodies as objects. Each item is rated on a Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree), with an option for indicating that an item is not applicable. Although the OBCS has three subscales – body surveillance, body shame, and control beliefs – only the surveillance and shame subscales were used. Higher scores indicate higher levels of objectified body consciousness. In a sample of undergraduate women, the OBCS was shown to be valid, internally consistent (*a* ranging from .68-.79), and have good test-retest reliability over a two-week period (*r* ranging from .73-.79; McKinley & Hyde, 1996). Cronbach's alpha coefficients for the current study were .79 for the Surveillance subscale and .76 for the Shame subscale.

**Body Esteem Scale (BES; Franzoi & Shields, 1984; Appendix C).** The BES is a 35-item self-report scale measuring feelings about body parts and functions, irrespective of actual or desired body size. Items are rated on a 5-point Likert-type scale, ranging from 1 (have strong negative feelings) to 5 (have strong positive feelings), with higher scores indicating more positive body esteem. The scale includes three sex-specific subscales, although only total scores were used in the current study. The Sexual Attractiveness subscale measures women's evaluation of their body's sexual attractiveness to others, particularly body parts that cannot be modified with diet and exercise, such as the face. The Weight Concern subscale measures women's dissatisfaction with body parts that are frequently objectified by men, and that can be modified via diet and exercise. The Physical Condition subscale measures women's evaluation of their body's physical capabilities, such as strength and agility. The BES has been shown to be valid (Franzoi & Herzog, 1986), have good test-retest reliability over a 3-month period (*r* ranging from

.75-.87; Franzoi, 1994), and have good internal consistency (α ranging from .78-.87; Franzoi & Shields, 1984). In the current study, Cronbach alpha coefficients across subscales ranged from .80 to .90.

**Upward and Downward Appearance Comparison Scales (UDACS; O'Brien et al., 2009; Appendix D).** The UDACS is an 18-item self-report scale, consisting of two subscales measuring the tendency to make physical appearance comparisons to people perceived as being very attractive (Upward Appearance Comparison Scale; UPACS) or unattractive (Downward Appearance Comparison Scale; DACS). Items are rated on a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Item responses are averaged, producing two separate scores for the UPACS and DACS, with higher scores indicating greater appearance comparison tendencies. Cronbach's alpha coefficients for the two scales were .93 and .90, demonstrating good internal consistency in a sample of undergraduate men and women. The UPACS and DACS have also shown good test-retest reliability over a two-week period ($r$ = .79 and .70, respectively; O'Brien et al., 2009). Cronbach's alpha in the current study was .95 for both the UPACS and DACS.

**Object of Desire Self-Consciousness – Sentence Completion and Sexual Fantasy Questionnaire (ODSC-SC & ODSC-SFQ; Bogaert & Brotto 2014); Appendices E & F).** The ODSC is an exploratory measure of object of desire self-consciousness, or the extent to which a person perceives him- or herself as being romantically and sexually desirable to another. The ODSC consists of three methodologies. While data were collected on two of the three methodologies, only the ODSC-SFQ was used in data analyses as it appeared to be a more valid indicator of ODSC. The first component, the ODSC-SC, consists of a series of sexual scenarios with a forced choice format in which participants are asked to choose a word or phrase from the

options provided in order to complete the sentences. The second component, the ODSC-SFQ, consists of a 62-item questionnaire measuring a variety of sexual fantasy themes. Of the 62 items, the 23 that measure ODSC were used in analyses. Items consist of a variety of sexual behaviors which are rated on a Likert-type scale ranging from 1 (not at all exciting) to 7 (extremely exciting). In the current study, Cronbach's alpha was .88 for the 23 items of the SFQ measuring ODSC.

**Erotic Self-Focus Experiences Questionnaire (ESFEX; Fertel , 2015; Appendix G).** The ESFEX is a 48-item self-report measure developed by the members of our human sexuality research lab. The ESFEX inquires about participants' own thoughts and behaviors associated with the construct of erotic self-focus, and contains questions related to sexual fantasies, the erotic value of self-focused preparation for sex, self-focus during sexual activity as a facilitator of arousal, erotic quality associated with femininity or masculinity, and some exploratory questions about self-focus and self-desirability. All items are rated on a seven point Likert-type scale assessing agreement or frequency. Higher scores indicate a greater endorsement of autoeroticism or self-focused eroticism. The Cronbach alpha coefficient in the current study was .73.

**Basic Empathy Scale – Adult (BES-A; Carré, Stefaniak, D'Ambrosio, Bensalah, & Besche-Richard, 2013; Appendix H).** The Basic Empathy Scale (BES; Jolliffe & Farrington, 2006) was originally developed to measure both cognitive and affective components of empathy in adolescents. Carré et al. (2013) validated the BES for use with adults (the BES-A), including a re-structuring of the subscales to incorporate the current conceptualization of empathy as consisting of three components. The first, emotional contagion, relates to the ability to automatically feel another's emotions. The second, cognitive empathy, relates to the ability to

understand another's emotions. The third, emotional disconnection, relates to the ability to distance oneself from another's emotions as a means of self-protection. The BES-A consists of 20-items, rated on a Likert-type scale ranging from 1(strongly disagree) to 5 (strongly agree), with higher scores indicating greater empathy. Only total scores were used in the current study. In a population of French adults, internal consistency was good, with Cronbach's alpha coefficients ranging from .69 to .82 (Carré et al., 2013). Cronbach's alpha coefficient was .88 in the current study. The BES-A has also been shown to have adequate test-retest reliability over a seven-week period, with correlations ranging from .56 to .74 (Carré et al., 2013).

**Demographic questionnaire (Appendix I).** A demographic questionnaire was administered to all participants to gather information on age, ethnicity, religious affiliation, level of education, and income, as well as information regarding relationship status, sexual experience, exposure to and feelings toward pornography, hormonal contraceptive use, and body mass index (BMI).

**Post-stimulus presentation items.**

The following items, modeled after those in Janssen et al. (2003) and Bossio et al. (2014), were administered to all participants: "How sexually arousing did you find the photos of women?"; "How sexually arousing did you find the photos of men?"; "Have you seen any of these photos before? If yes, where?"; "To what extent did you imagine yourself as viewing the photos as an observer, simply looking at them?"; "To what extent did you imagine yourself as a participant, imagining yourself as one of the actors in the photos?"; "To what extent did you identify with the male actors in the photos?"; "To what extent did you identify with the female actors in the photos?" Items were rated on a Likert-type scale ranging from 1(very unarousing/not at all) to 5 (very arousing/very much).

## Stimuli

Participants viewed 12 split-screen slides, each featuring an erotic photo of a nude man on one side of the screen and an erotic photo of a nude woman on the other side. The 12 images were obtained from online websites found via Google searches and were selected such that, within each slide, images were matched for size, amount of genital exposure, and body position of models (images are available from author by request). Slides were presented for 10 seconds each, in randomized order. Designated regions of interest were drawn around the body and head of each male and female actor; all data were collected from within these regions. Regions outside these designated areas are considered context and no gender differences in viewing context have been found (Lykins et al., 2008). As context is not a gender-specific region of interest, data were not collected from this region. A calibration slide consisting of a small white crosshair centered on a black screen was also presented for five seconds between each erotic slide.

## Apparatus

Stimuli were presented on an ASUS VW193T LCD monitor using an Intel® G41 Express Chip graphics card operating at a refresh rate of 60 Hz and a resolution of 1440 x 900 pixels x 16.7M colors. Eye movements were captured and recorded by an ASL D6 remote desktop eye-tracker. The system uses infra-red (870 nm) video-based technology to track the eyes. The Video Head Tracker utilizes ambient light to recognize facial features and track the position of the eye relative to the D6 optics. Eye positions are recorded at 120 Hz. Although viewing is binocular, only the position of the left eye was tracked as is common in eye-tracking literature.

## Procedure

Protocol approval was first obtained by the UNLV Social/Behavioral Institutional Review Board (IRB; Protocol #: 1410-4979M). Each eye-tracking session began with a brief description of the study procedures. Participants read and signed the informed consent and were given a copy for their records. All participants were informed that they could discontinue participation in the study at any time, without penalty, and that their data would be numerically coded and not directly linked to any identifying information. Participants then had an opportunity to ask questions. Once any questions were answered, participants were informed that they would be viewing a slideshow depicting images of nude men and women. They were instructed to look at each screen presentation as they normally would and, when a calibration slide appeared, to gaze at the white sign in the center of the slide until a new slide of images appears, at which time they should resume natural viewing. Participants were informed that on-screen instructions would notify them when the eye-tracking portion of the study was complete. Once complete, they answered the post-stimulus presentation questions presented on the screen which assessed the extent to which a participant or observer point of view was adopted and the extent to which they identified with the male and female actor.

Next, participants were instructed to sit in a comfortable position that could be maintained for the duration of the study as they needed to remain as still as possible. Once the participant was positioned, the eye-tracker was calibrated. The calibration screen consisted of a white nine-dot matrix on a grey background. Participants were asked to fixate on each marker in succession in order to accurately capture each participant's unique gaze coordinates. This process was repeated until each of the nine markers was accurately calibrated. Once calibrated, participants were notified that the calibration was complete and that they should continue to

remain as still as possible for the duration of the eye-tracking study. The experimenter then left the room so that the participant could complete the study. Upon completion of the eye-tracking portion of the study, participants were provided with instructions for completing the online questionnaire portion of the study, completed on their own after leaving the lab using secure Qualtrics online survey software. The surveys were presented in a randomized order, with exception of the demographic questionnaire which all participants completed last. Participants were also provided an opportunity to ask questions, invited to contact the experimenter at any time with further questions, and thanked for their participation. The eye-tracking portion of the study lasted approximately 25 minutes; the questionnaire portion took approximately an hour to complete.

## Data Analyses

Descriptive analyses were computed for participant background variables. Eye-tracking results were analyzed in two paired-samples t-tests (one each for number of fixations and total gaze time) in order to determine if there were significant differences in the average number of fixations or average gaze time on the male and female images. Bivariate correlational analyses were conducted to examine the relationships between measures of visual attention and hypothesized related variables. Regression analyses were conducted to investigate the extent to which sexual fluidity, appearance-focused social comparison, body esteem, self-objectification, object of desire self-consciousness, erotic self-focus, and empathic orientation in combination predict number of fixations/total gaze time on the male image minus number of fixations/total gaze time on the female image (difference scores). A number of additional exploratory regression analyses and multivariate analyses of variance were also conducted to further explore the relationship of these constructs to visual attention.

# CHAPTER 5

# RESULTS

## Overview

Data were collected and analyzed for two dependent measures: 1) number of fixations and 2) total fixation duration. As expected, number of fixations and total fixation duration were significantly positively correlated ($r = .95$, $p < .001$). Relationships between dependent measures and demographic variables will first be presented. Results were analyzed in two paired-samples t-tests to determine whether there were significant differences in visual attention to the male and female images, followed by correlational and standard regression analyses to explore the relationship of measures of interest with visual attention. Results of exploratory standard regressions and multivariate analyses of variance will also be presented. One participant outlier (values three standard deviations above or below the mean) on both number of fixations and fixation duration difference scores was identified. One participant outlier on the Basic Empathy Scale – Adult (BES-A) was also identified. In addition to identifying participants who had outlying scores on the measures, we also analyzed the images themselves for outliers; while there were significant differences in visual attention among some male/female image pairs, the mean number of fixations and fixation duration were within 1 standard deviation of the overall mean and thus not considered outliers. Analyses were run with and without the participant outliers, as well as with and without the two image pairs that differed from the other ten, yielding no significant differences in the results; as such, results will be presented using the full data set and with all twelve image pairs.

**Relationships Between Visual Attention and Demographic Variables**

We did not find significant associations between visual attention and age, participant ethnicity, religious affiliation, level of education, use of hormonal contraceptives, BMI, relationship status, frequency of accessing erotic visual material, feelings toward erotic visual material, age of first intercourse, whether they had ever had sexual intercourse, and number of lifetime sexual partners. We did find significant group differences in difference scores for average number of fixations based upon participant income levels ($F$ [6, 110] = 2.18, $p$ = .05); however, none of the post-hoc comparisons using Tukey HSD were significant. Furthermore, examination of the means plots indicated that the relationship of income to the average number of fixations difference score was not linear. Income was therefore not utilized in subsequent analyses as a covariate.

**Missing Data**

The Objectified Body Consciousness Scale (OBCS) Shame subscale had missing data for 8 participants. These participants answered too few items (i.e., did not answer or replied "N/A" to two or more items on the subscale) to obtain a valid subscale score. To replace missing data for these participants, the sum of the subscale items that they did answer was entered (i.e., if a participant answered only 4 items, the sum of these 4 items was used). Analyses were run with and without missing data, yielding no significant differences in the results.

**Data Normality**

Several variables violated the assumption of normality. Number of fixation difference scores, fixation duration difference scores, Multidimensional Scale of Sexuality (MSS), and Downward Appearance Comparison Scale (DACS) were transformed using square root transformations as they were positively skewed; OBCS Surveillance, Upward Appearance

Comparison Scale (UPACS), and BES-A were transformed using reflect and square root transformations as they were negatively skewed. Transforming variables had no effect on analyses, so non-transformed data was used in the subsequent analyses.

## Main Analyses

### Visual Attention to Male and Female Images

Table 2 displays descriptive statistics and the results of the paired-samples t-tests for number of fixations and fixation duration. Figures 1 and 2 display distributions for number of fixations and fixation duration on all of the male and female images presented. The number of fixations on the female images violated the assumption of normality ($S\text{-}W = .977$, $df = 117$, $p = .038$). The number of fixations on the male images ($M = 8.35$, $SD = 3.80$) was significantly greater than the number of fixations on the female images ($M = 6.37$, $SD = 2.91$), $t\ (116) = 5.88$, $p < .001$. The average difference in number of fixations was 1.98 with a 95% CI ranging from 1.32 to 2.65. The eta squared (.23) indicated a large effect size. The total fixation duration (in milliseconds) on the male images ($M = 2825.93$, $SD = 1320.58$) was significantly greater than the fixation duration (in ms) on the female images ($M = 2154.67$, $SD = 1076.66$), $t\ (116) = 4.94$, $p < .001$. The average difference in fixation duration was 671.27 with a 95% CI ranging from 402.19 to 940.34. The eta squared (.17) indicated a large effect size. A post hoc power analysis using the program G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 1996) revealed that the power of both paired-samples t-tests was .99.

*Table 2. Descriptive Statistics and Results of Paired-Samples T-Tests Comparing Visual Attention to Male and Female Images*

| | Male Images | | Female Images | | | | | |
|---|---|---|---|---|---|---|---|---|
| | M | SD | M | SD | N | 95% CI for Mean Difference | t | df |
| Number of Fixations | 8.35 | 3.80 | 6.37 | 2.91 | 117 | 1.32, 2.65 | 5.88*** | 116 |
| Fixation Duration (in ms) | 2825.93 | 1320.58 | 2154.67 | 1076.66 | 117 | 402.19, 940.34 | 4.94*** | 116 |

***$p < .001$

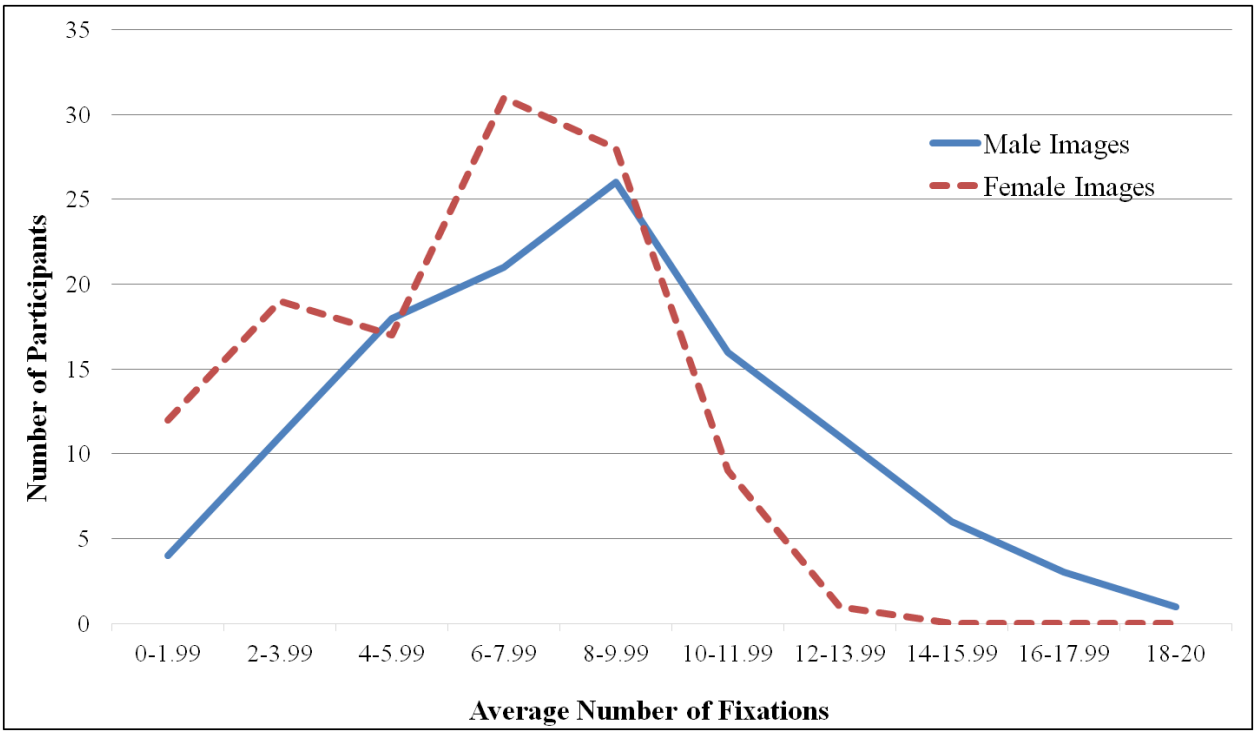


*Figure 1. Frequency Distribution of Average Number of Fixations on Male and Female Images Across All Slides*

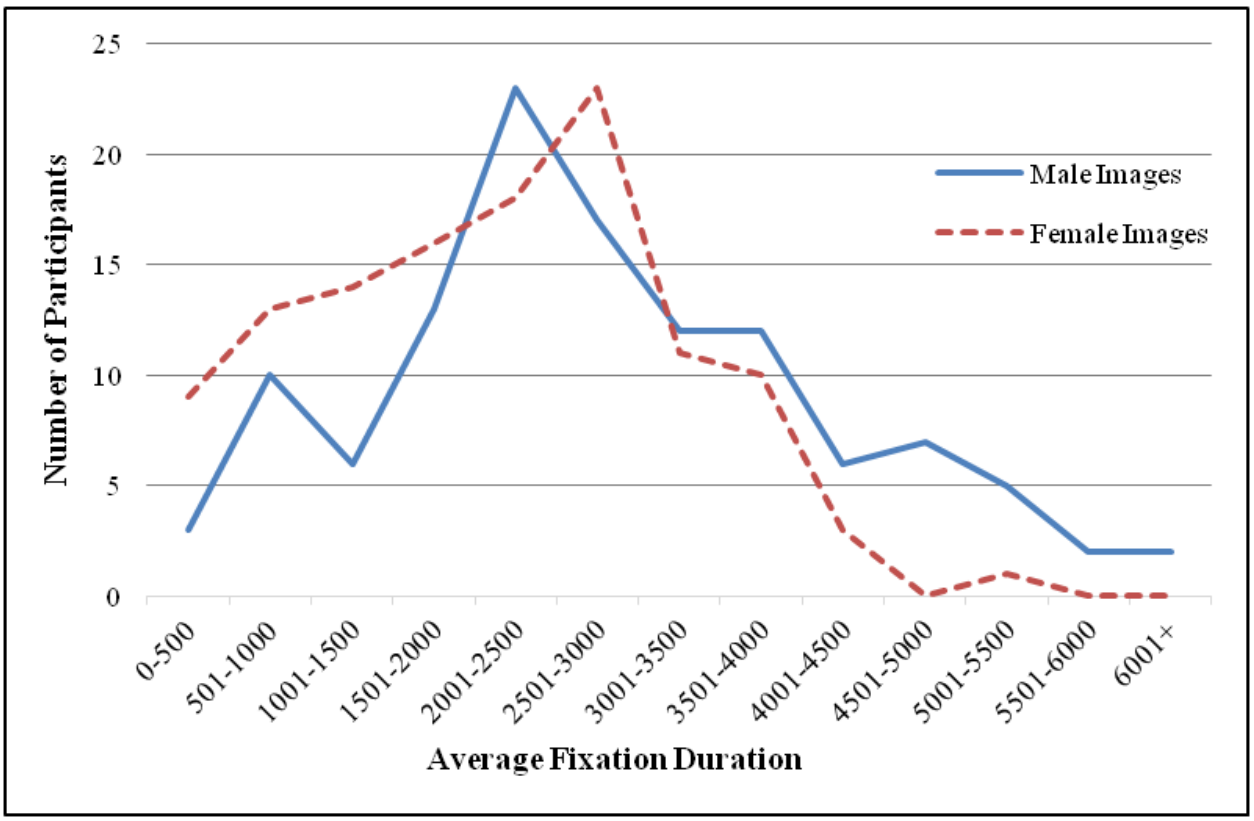


*Figure 2. Frequency Distribution of Average Fixation Duration on Male and Female Images Across All Slides*

Male minus female difference scores were calculated to be used in subsequent analyses. Table 3 displays means and SDs, and Figures 3 and 4 display frequency distributions, for difference scores on number of fixations and fixation duration. The difference scores for number of fixations violated the assumption of normality (*S-W* = .969, *df* = 117, *p* = .008). The difference scores for fixation duration also violated the assumption of normality (*S-W* = .973, *df* = 117, *p* = .02).

*Table 3. Means and SDs for Total Number of Fixation and Total Fixation Duration Difference Scores(Male-Female)*

| | M | SD |
|---|---|---|
| Number of Fixations | 1.98 | 3.65 |
| Fixation Duration (in ms) | 671.27 | 1469.48 |

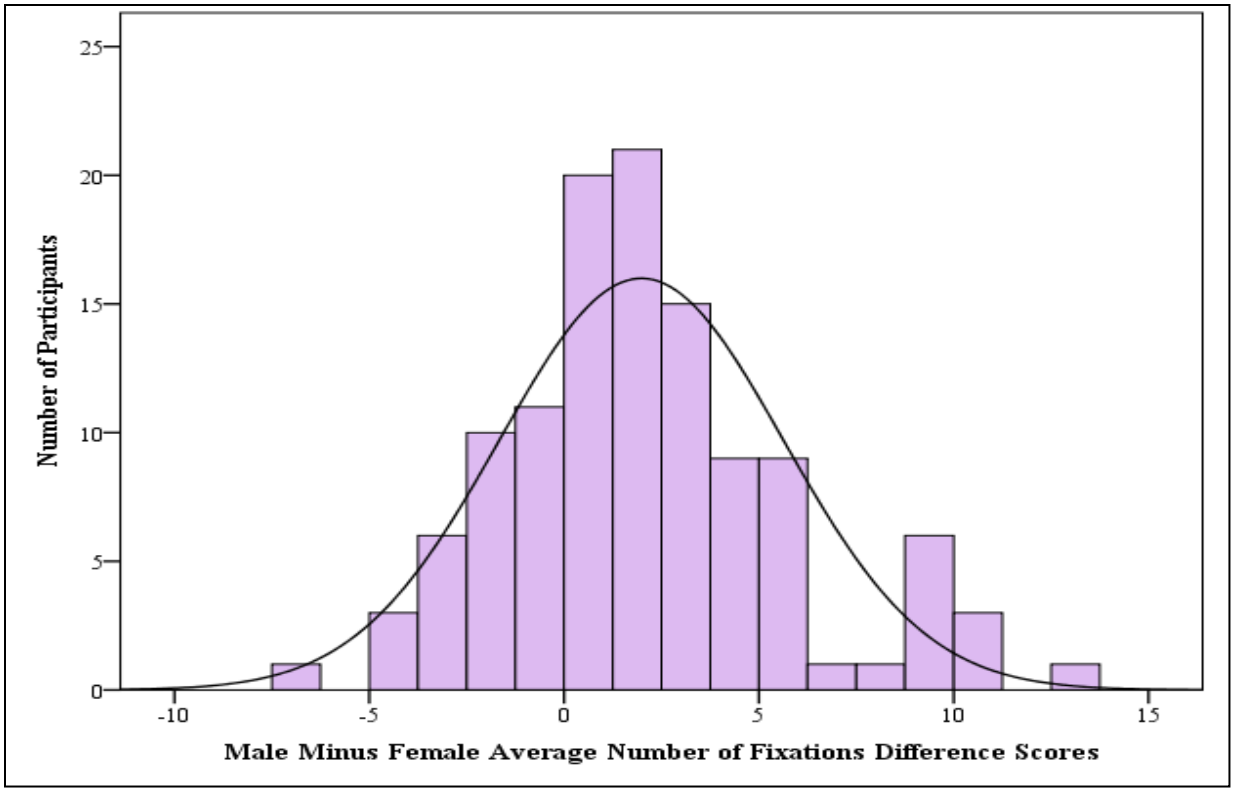


*Figure 3. Frequency Distribution of Average Number of Fixations Difference Scores*

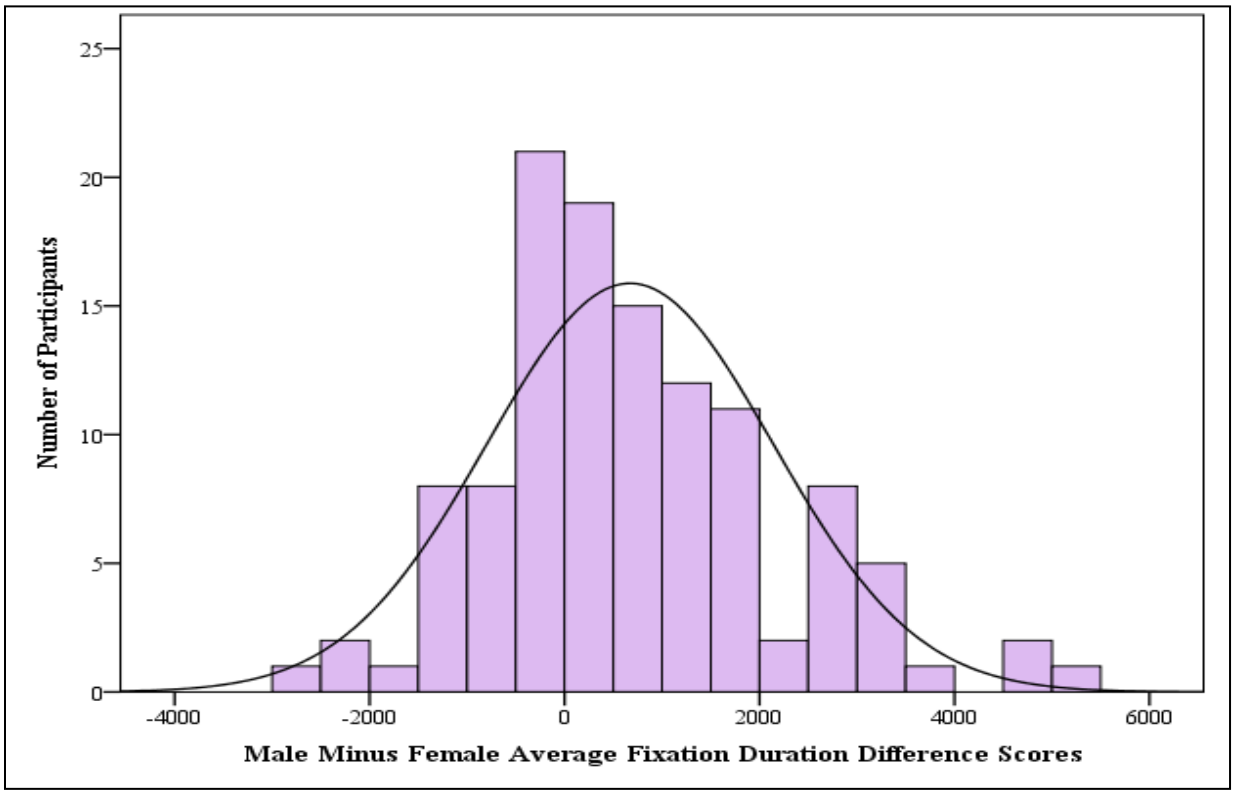


*Figure 4. Frequency Distribution of Average Fixation Duration Difference Scores*

**Relationship of Visual Attention to Male and Female Images and Constructs Hypothesized to be Potentially Related to Visual Attention**

Means and standard deviations for all independent variables are presented in Table 4. Results of bivariate correlation analyses between visual attention and post-stimulus questionnaire items are presented in Table 5. Difference scores for both average number of fixations and average fixation duration were significantly positively correlated with how sexually arousing participants found the images of the male actors (respectively, $\rho$ = .28 & .27, both $p < .01$) such that increased visual attention to the male, as compared to female, images was associated with higher sexual arousal ratings for the male photos. Conversely, difference scores for both average number of fixations and average fixation duration were significantly negatively correlated with how sexually arousing participants found the images of the female actors (respectively, $\rho$ = -.19 & -.20, both $p < .05$), with increased visual attention to the male, as compared to female, images associated with lower sexual arousal ratings for the female images. Average fixation duration difference scores were significantly negatively correlated ($\rho$ = -.19, $p$, < .05) with the extent participants identified with the female actor, such that increased visual attention to the male, as compared to female, images was associated with less identification with the female actor. The average number of fixations on the female images was significantly positively correlated with the extent participants identified with the female actor ($\rho$ = .19, $p$, < .05), such that greater identification was associated with greater number of fixations on the female images. Difference scores were not significantly correlated with the extent participants viewed the images as an observer or participant.

Results of bivariate correlation analyses between visual attention and self-report measures of interest are presented in Table 6. Difference scores were negatively correlated with

scores on the MSS Sequential Bisexual subscale ($r$ = -.20 & -.22, both $p < .05$, for average number of fixations and average fixation duration, respectively), such that increased visual attention to the male, compared to female, images was associated with lower endorsement of cognitive/affective indicators of bisexuality. Visual attention to the female images was significantly positively correlated with scores on the MSS Sequential Bisexual subscale ($r$ = .33 & .31, both $p < .01$, for average number of fixations and average fixation duration, respectively), such that increased visual attention on the female images was associated with greater endorsement of cognitive/affective indicators of bisexuality. Average fixation duration on the female images was significantly positively correlated with scores on the Upward Appearance Comparison Scale ($r$ = .19, $p < .05$), such that increased fixation duration on the female images was associated with greater endorsement of upward appearance comparison. There were no other significant correlations between visual attention and self-report measures.

*Table 4. Means and SDs of Independent Variables (N = 117)*

| | M | SD |
|---|---|---|
| Arousal to male images (5-point scale) | 3.91 | 1.66 |
| Arousal to female images (5-point scale) | 2.87 | 1.57 |
| Viewed as an observer (5-point scale) | 4.72 | 1.92 |
| Viewed as a participant (5-point scale) | 1.83 | 1.40 |
| Identification with male actors (5-point scale) | 1.56 | 1.17 |
| Identification with female actors (5-point scale) | 2.63 | 1.69 |
| MSS Sequential Bisexual (Range: 0 – 1) | .31 | .30 |
| OBCS Surveillance (Range: 0 – 8) | 4.84 | 1.03 |
| OBCS Shame (Range: 0 – 7) | 3.55 | 1.16 |
| BES (Range: 35 – 175) | 110.97 | 20.65 |
| UPACS (Range: 1 – 5) | 3.53 | .92 |
| ODSC-SFQ (Range: 1 – 7) | 3.7 | 1.07 |
| ESFEX (Range: 46 – 322) | 184.06 | 24.87 |
| BES-A (Range: 20 – 100) | 75.27 | 9.89 |

*Table 5. Correlations Between Visual Attention and Post-Stimulus Questionnaire Items*

| Spearman $\rho$ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Fixation difference scores | - | | | | | | | | | | | |
| 2. Duration difference scores | - | - | | | | | | | | | | |
| 3. Male average number of fixations | - | - | - | | | | | | | | | |
| 4. Male average fixation duration | - | - | - | - | | | | | | | | |
| 5. Female average number of fixations | - | - | - | - | - | | | | | | | |
| 6. Female average fixation duration | - | - | - | - | - | - | | | | | | |
| 7. Arousal rating of male images | .28** | .27** | .28** | .25** | .00 | -.06 | - | | | | | |
| 8. Arousal rating of female images | -.19* | -.20* | -.04 | -.13 | .18* | .14 | .28** | - | | | | |
| 9. Extent viewed as an observer | .10 | .07 | .09 | .04 | .01 | .01 | -.01 | .15 | - | | | |
| 10. Extent viewed as a participant | .02 | .01 | .14 | .08 | .14 | .09 | .43** | .30** | .01 | - | | |
| 11. Extent identified with male actor | -.04 | -.05 | .06 | .07 | .11 | .12 | .14 | .07 | -.14 | .12 | - | |
| 12. Extent identified with female actor | -.16 | -.19* | .04 | -.03 | .19* | .17 | .20* | .35** | -.14 | .45** | .36** | - |

*$p < .05$, **$p < .01$

*Table 6. Correlations Between Visual Attention and Self-Report Measures of Interest*

| Pearson *r* | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Fixation difference scores | - | | | | | | | | | | | | | |
| 2. Duration difference scores | .95** | - | | | | | | | | | | | | |
| 3. Male average number of fixations | .70** | .62** | - | | | | | | | | | | | |
| 4. Male average fixation duration | .70** | .71** | .91** | - | | | | | | | | | | |
| 5. Female average number of fixations | -.34** | -.39** | .44** | .31** | - | | | | | | | | | |
| 6. Female average fixation duration | -.44** | -.50* | .27** | .26** | .91** | - | | | | | | | | |
| 7. MSS sequential bisexual | -.20* | -.22* | .06 | .01 | .33** | .31** | - | | | | | | | |
| 8. OBCS Surveillance | -.03 | -.05 | -.01 | .02 | .04 | .09 | .06 | - | | | | | | |
| 9. OBCS Shame | -.06 | -.09 | .04 | .05 | .13 | .18 | .17 | .43** | - | | | | | |
| 10. BES | .04 | .06 | -.03 | -.02 | -.08 | -.11 | -.11 | -.46** | -.52** | - | | | | |
| 11. UPACS | -.08 | -.09 | .05 | .05 | .17 | .19* | .21* | .49** | .61** | -.39** | - | | | |
| 12. ODSC-SFQ | .01 | -.01 | .11 | .08 | .13 | .11 | .28** | .08 | .15 | -.02 | .20* | - | | |
| 13. ESFEX | -.05 | -.11 | .07 | -.04 | .15 | .10 | .33** | .15 | .06 | .04 | .16 | .41** | - | |
| 14. BES-A | -.04 | -.05 | .04 | .02 | .10 | .09 | .33** | .26** | .14 | -.05 | .33** | .18* | .15 | - |

*Note:* MSS = Multidimensional Scale of Sexuality; OBCS = Objectified Body Consciousness Scale; BES = Body Esteem Scale; UPACS = Upward Appearance Comparison Scale; ODSC-SFQ = Object of Desire Self-Consciousness – Sexual Fantasy Questionnaire; ESFEX = Erotic Self-Focus Experiences Questionnaire; BES-A = Basic Empathy Scale – Adult

*$p < .05$, **$p < .01$

Although bivariate correlations did not indicate any individual associations between visual attention and self-report measures of interest, we ran two standard multiple regressions to assess the ability of combined measures of sexual fluidity, appearance-focused social comparison, body esteem, self-objectification, object of desire self-consciousness, erotic self-focus, and empathy to predict difference scores for average number of fixations (Table 7) and average fixation duration (Table 8). Each measure was entered independently, yielding a total of 8 predictor variables (MSS Sequential Bisexual, OBCS Surveillance subscale, OBCS Shame subscale, BES total score, UPACS, ODSC-SFQ, ESFEX total score, BES-A total score). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. The results of the regression indicated that the variables of interest together are not significant predictors of the average number of fixations on the male, compared to female, images ($R^2_{adj}$ = -.02, F(8, 108) = .70, $p$ = .694) or average fixation duration on the male, compared to female, images ($R^2_{adj}$ = -.01, F(8, 108) = .85, $p$ = .564). Post hoc analyses using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 1996) indicated observed power of .17 for number of fixations and .22 for fixation duration. Guidelines presented in Tabachnick and Fidell (2013) suggest the current sample size was adequate to detect a medium-size relationship at $\alpha = 0.5$ and $\beta = .20$ with 8 predictors; however, to detect a small effect, a sample size of approximately 407 would have been needed. Small effects were of little interest in the current study.

*Table 7. Standard Multiple Regression on Male Minus Female Average Number of Fixation Difference Scores and Self-Report Measures of Interest*

| Overall Model | *F* | *df* | *p* | $R^2_{adj}$ | |
|---|---|---|---|---|---|
| | .70 | 8, 108 | .694 | -.02 | |
| **Predictor Variable** | ***B*** | ***SE B*** | **β** | ***t*** | ***p*** |
| MSS Sequential | -2.747 | 1.311 | -.225 | -2.096 | .038 |
| OBCS Surveillance | -.053 | .417 | -.015 | -.128 | .899 |
| OBCS Shame | -.043 | .407 | -.014 | -.105 | .916 |
| BES | -.003 | .021 | -.018 | -.153 | .878 |
| UPACS | -.208 | .513 | -.053 | -.405 | .686 |
| ODSC-SFQ | .251 | .359 | .074 | .699 | .486 |
| ESFEX | .001 | .017 | .006 | .051 | .960 |
| BES-A | .014 | .039 | .039 | .363 | .717 |

*Table 8. Standard Multiple Regression on Male Minus Female Average Fixation Duration Difference Scores and Self-Report Measures of Interest*

| Overall Model | *F* | *df* | *p* | $R^2_{adj}$ | |
|---|---|---|---|---|---|
| | .85 | 8, 108 | .564 | -.01 | |
| **Predictor Variable** | ***B*** | ***SE B*** | **β** | ***t*** | ***p*** |
| MSS Sequential | -1060.021 | 525.452 | -.216 | -2.017 | .046 |
| OBCS Surveillance | -12.379 | 167.113 | -.009 | -.074 | .941 |
| OBCS Shame | -.42.760 | 163.239 | -.034 | -.262 | .794 |
| BES | .638 | 8.303 | -.009 | .077 | .939 |
| UPACS | -58.381 | 205.419 | -.037 | -.284 | .777 |
| ODSC-SFQ | 120.875 | 143.826 | .088 | .840 | .403 |
| ESFEX | -4.248 | 6.805 | -.067 | -.624 | .534 |
| BES-A | 5.393 | 15.737 | .036 | .343 | .732 |

**Exploratory Analyses**

Given the lack of significant regression results entering each measure and subscales (as applicable) independently, exploratory standard multiple regressions were also run. First, subscale scores were combined on any measures containing subscales, yielding a total of 7 predictor variables (sum of MSS bisexual scales, OBCS Shame and Surveillance, BES, UPACS and DACS, ODSC-SFQ, ESFEX, and BES-A). This had no effect on regression outcomes. Second, regression analyses were run using average number of fixations and average fixation duration for the male and female images separately rather than difference scores (maintaining the original 8 predictor variables; See Tables 9-12). These regression analyses were non-significant, though they approached significance for visual attention to the female images (number of fixations: $R^2_{adj} = .06$, $F(8, 108) = 1.90$, $p = .067$; fixation duration: $R^2_{adj} = .05$, $F(8, 108) = 1.77$, $p = .09$), but not male images (number of fixations: $R^2_{adj} = -.06$, $F(8, 108) = .21$, $p = .988$; fixation duration: $R^2_{adj} = -.06$, $F(8, 108) = .21$, $p = .989$).

*Table 9. Standard Multiple Regression on Female Image Average Number of Fixations and Self-Report Measures of Interest*

| Overall Model | *F* | *df* | *p* | $R^2_{adj}$ | |
|---|---|---|---|---|---|
| | 1.90 | 8, 108 | .067 | .06 | |
| **Predictor Variable** | ***B*** | ***SE B*** | **β** | ***t*** | ***p*** |
| MSS Sequential | 2.918 | 1.006 | .300 | 2.902 | .004 |
| OBCS Surveillance | -.135 | .320 | -.048 | -.423 | .673 |
| OBCS Shame | 0.72 | .312 | .029 | .232 | .817 |
| BES | -.002 | .016 | -.015 | -.133 | .895 |
| UPACS | .330 | .393 | .104 | .839 | .403 |
| ODSC-SFQ | .060 | .275 | .022 | .219 | .827 |
| ESFEX | .004 | .013 | .031 | .297 | .767 |
| BES-A | -.010 | .030 | -.034 | -.331 | .741 |

*Table 10. Standard Multiple Regression on Female Image Average Fixation Duration and Self-Report Measures of Interest*

| Overall Model | *F* | *df* | *p* | $R^2_{adj}$ | |
|---|---|---|---|---|---|
| | 1.77 | 8, 108 | .090 | .05 | |
| Predictor Variable | *B* | *SE B* | β | *t* | *p* |
| MSS Sequential | 1054.209 | 373.122 | .293 | 2.825 | .006 |
| OBCS Surveillance | 12.271 | 118.667 | .012 | .103 | .918 |
| OBCS Shame | 64.161 | 115.916 | .069 | .554 | .581 |
| BES | -.162 | 5.896 | -.003 | -.027 | .978 |
| UPACS | 112.525 | 145.867 | .096 | .771 | .442 |
| ODSC-SFQ | 12.475 | 102.130 | .012 | .122 | .903 |
| ESFEX | -.867 | 4.832 | -.019 | -.179 | .858 |
| BES-A | -5.654 | 11.175 | -.052 | -.506 | .614 |

*Table 11. Standard Multiple Regression on Male Image Average Number of Fixations and Self-Report Measures of Interest*

| Overall Model | *F* | *df* | *p* | $R^2_{adj}$ | |
|---|---|---|---|---|---|
| | .213 | 8, 108 | .988 | -.06 | |
| Predictor Variable | *B* | *SE B* | β | *t* | *p* |
| MSS Sequential | .171 | 1.392 | .013 | .123 | .902 |
| OBCS Surveillance | -.189 | .443 | -.051 | -.426 | .671 |
| OBCS Shame | .030 | .432 | .009 | .068 | .946 |
| BES | -.005 | .022 | -.029 | -.240 | .811 |
| UPACS | .122 | .544 | .030 | .225 | .823 |
| ODSC-SFQ | .311 | .381 | .088 | .817 | .416 |
| ESFEX | .005 | .018 | .029 | .262 | .794 |
| BES-A | .004 | .042 | .011 | .103 | .918 |

*Table 12. Standard Multiple Regression on Male Image Average Fixation Duration and Self-Report Measures of Interest*

| Overall Model | *F* | *df* | *p* | $R^2_{adj}$ | |
|---|---|---|---|---|---|
| | .205 | 8, 108 | .989 | -.06 | |
| **Predictor Variable** | ***B*** | ***SE B*** | **β** | ***t*** | ***p*** |
| MSS Sequential | -5.811 | 483.123 | -.001 | -.012 | .990 |
| OBCS Surveillance | -.109 | 153.651 | .000 | -.001 | .999 |
| OBCS Shame | 21.401 | 150.090 | .019 | .143 | .887 |
| BES | .476 | 7.635 | .007 | .062 | .950 |
| UPACS | 54.145 | 188.871 | .038 | .287 | .775 |
| ODSC-SFQ | 133.350 | 132.240 | .108 | 1.008 | .316 |
| ESFEX | -5.115 | 6.256 | -.090 | -.818 | .415 |
| BES-A | -.260 | 14.469 | -.002 | -.018 | .986 |

Several exploratory multivariate analyses of variance (MANOVAs) were also run to determine whether scores on the eight self-report measures of interest differed significantly between participants grouped in a variety of ways: 1) whether participants looked more at the male or female image; 2) whether participants' viewing time on the female images fell above or below the median; 3) whether participants' difference scores fell above or below the median; 4) whether participants' viewing time on the female images fell in the top or bottom 25%; and 5) whether participants' difference scores fell in the top or bottom 25%. There was not a statistically significant difference between groups on the combined measures; participants in these groupings did not differ significantly in their scores on the self-report measures of interest. Observed power for these analyses ranged from .34 to .67.

# CHAPTER 6

# DISCUSSION

## Summary of Findings

The aim of this study was to investigate a number of theoretically plausible explanations for why heterosexual women consistently attend more equally to sexual stimuli featuring their erotic and/or non-erotic target than do heterosexual men. We investigated the extent to which measures assessing erotic plasticity/sexual fluidity, appearance-focused social comparison/objectification, erotic self-focus, and empathic identification accounted for heterosexual women's visual attention to erotic stimuli. The nature of this study was exploratory as there was little empirical evidence to suggest how these constructs would interact or contribute to visual attention patterns.

There was a significant difference in visual attention to the male and female images. Women had a greater number of fixations and total fixation duration on the male images than on the female images.

Sexual arousal ratings of the male images were significantly positively related with difference scores for number of fixations and fixation duration while sexual arousal ratings of the female images were negatively correlated with these visual attention measures. Thus, the more sexually arousing women found the images of the male actors, the greater their visual attention toward the male compared to the female images, and the more sexually arousing women found the images of the female actors, the lower their visual attention toward the male compared to the female images. When data were analyzed by absolute number of fixations and duration on the images instead of difference scores, arousal ratings of the male photos were positively correlated with attention to the male photos and uncorrelated with attention to the female photos. Arousal

ratings of the female photos were positively correlated to average number of fixations on the female photos, and not correlated with viewing of the male photos.

Identification with the female actors was significantly negatively correlated with difference scores for average fixation duration, such that greater visual attention to the male, compared to female, images was associated with less identification with the female actor. Similarly, identification with the female actors was positively correlated with the average number of fixations on the female images.

The Multidimensional Scale of Sexuality (MSS) Sequential Bisexual subscale was the only self-report measure of interest that was significantly correlated with visual attention difference scores. Both number of fixations and fixation duration difference scores were negatively correlated with scores on the MSS; greater visual attention to the male, compared to female, images was associated with lower endorsement of cognitive/affective indicators of sexual fluidity. These correlations, though significant, were weak with both $r$ 's $< -.22$. When the average number of fixations and average fixation duration on the male and female images were examined independently, scores on the MSS were positively correlated with viewing of the female images, and not correlated with viewing of the male images. The Upward Appearance Comparison Scale (UPACS) was also positively correlated with the average fixation duration on the female images.

Regressions of different combinations of measures of sexual fluidity, upward and downward appearance-focused social comparison, body esteem, self-objectification, object of desire self-consciousness, erotic self-focus, and empathy on difference scores for average number of fixations and average fixation duration were not significant. While the observed power was quite low, the current sample size (N = 117) should have been adequate to detect a

medium-size relationship with these predictor variables. Additional exploratory regressions using average number of fixations and average fixation duration for the male and female images separately were again not significant. One contrast worth noting was that regressions utilizing visual attention to the female images instead of difference scores as the dependent variables approached significance, with *p* values of .067 for number of fixations and .09 for fixation duration. The only predictor variable that was significant was the MSS Sequential Bisexual – our measure of sexual fluidity. Lastly, exploratory MANOVAs run to determine whether scores on the eight self-report measures of interest differed significantly between participants when they were grouped in a variety of ways – iterations of separating them into "high" and "low" groups based on their visual attention patterns - yielded no significant findings.

## Interpretation of Results

### Visual Attention Patterns

Women's greater visual attention to male versus female images in the current study aligns with previous research in which heterosexual women spent more time viewing opposite-sex images than same-sex images (Akhter et al., 2014; Dawson & Chivers, 2016; Dawson, Fretz, & Chivers, 2017; Israel & Strassberg, 2009; Lykins et al., 2008). While Jones and Meana (2013) did not find a statistically significant difference in heterosexual women's visual attention to male and female images, women did look slightly longer at the male images, and lack of statistical significance was likely an artifact of small sample size (N = 40) and low power. For comparison, Table 13 shows the means and standard deviations for heterosexual men and women's visual attention to male and female images in the current study and similar other studies. Women's visual attention to male and female images in the current study align with those in previous studies both in terms of absolute visual attention to male and female images,

and in relative difference between visual attention to the male and female images. Although we found a category-specific pattern of visual attention, participants' visual attention to the male and female images clearly was much more diffuse than seen in men's visual attention patterns found in similar studies (e.g., Akhter, et al., 2014; Dawson & Chivers, 2016; Israel & Strassberg, 2009; Lippa 2012, 2013, 2017; Lykins et al., 2008; Rupp & Wallen, 2007; Tsujimura et al., 2009).

*Table 13. Comparison of Means and SDs for Number of Fixations and Fixation Duration Across Five Eye-Tracking Studies*

| | Male Images | | | | Female Images | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number of Fixations | | Fixation Duration (in ms) | | Number of Fixations | | Fixation Duration (in ms) | | |
| | M | SD | M | SD | M | SD | M | SD | N |
| Heterosexual Women | | | | | | | | | |
| Current Study | 8.35 | 3.80 | 2825.93 | 1320.58 | 6.37 | 2.91 | 2154.67 | 1076.66 | 117 |
| Jones & Meana (2013) | 9.10 | 3.09 | 3547.67 | 1604.82 | 7.31 | 2.78 | 2640.25 | 1281.89 | 40 |
| Lykins et al. (2008) | 8.14 | 3.40 | 2874.22 | 1150.56 | 7.67 | 4.14 | 2491.50 | 1118.34 | 20 |
| Akhter et al. (2014) | 8.13 | 1.85 | 3075.73 | 642.71 | 5.76 | 1.63 | 2099.35 | 643.19 | 20 |
| Dawson & Chivers (2016; Block 1) | 10.09 | 2.03 | 4920 | 1090 | 8.36 | 2.08 | 3570 | 940 | 53 |
| Heterosexual Men | | | | | | | | | |
| Lykins et al. (2008) | 6.09 | 3.18 | 1811.84 | 919.20 | 10.58 | 5.64 | 3418.68 | 503.75 | 20 |
| Akhter et al. (2014) | 2.24 | 1.63 | 682.70 | 1132.91 | 10.87 | 1.99 | 4719.69 | 2465.07 | 20 |
| Dawson & Chivers (2016; Block 1) | 5.43 | 1.49 | 2320 | 770 | 12.32 | 1.55 | 6320 | 840 | 22 |

Analyses of difference scores (attention to male image minus attention to female image) indicated that, despite spending significantly more time viewing the male images than the female

images, the distributions of difference scores for average number of fixations and average fixation duration again indicated relative category non-specificity (see Figures 3 and 4). Figure 5 provides a visual comparison of frequency distributions for difference scores in the current study with those from Jones and Meana (2013), with means in both studies hovering close to zero. In summary, the viewing patterns of the sample of women in the current study were comparable to the viewing patterns of women in other comparable studies, with roughly equivalent diffusion of attention between the male and female images.

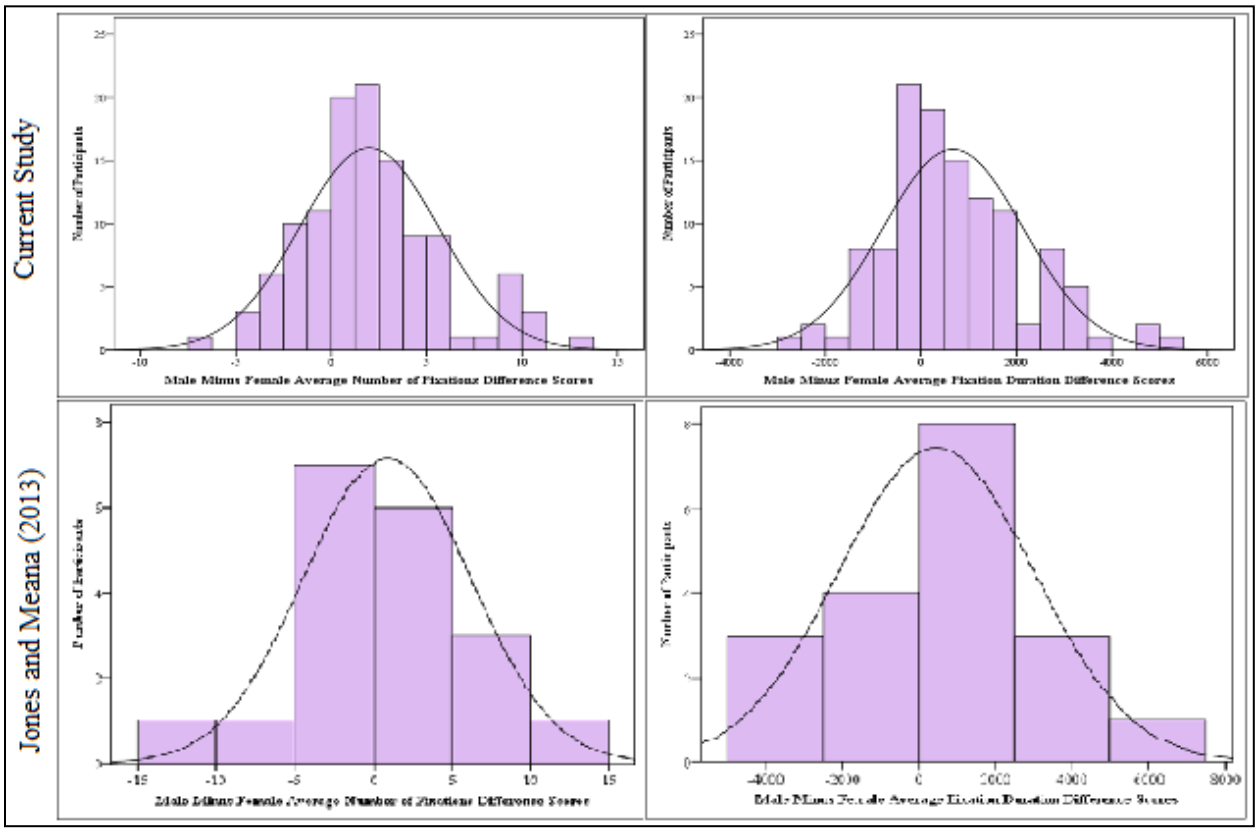


*Figure 5. Visual Comparison of Frequency Distributions for Male Minus Female Difference Scores From the Current Study With Frequency Distributions for Male Minus Female Difference Scores From Jones and Meana, 2013*

**The role of arousal and sexual fluidity**

Results of the current study provide some support for the hypothesis that heterosexual women's visual attention to erotic images is a cognitive reflection of sexual arousal and sexual fluidity. The more arousing participants found the images of men and less arousing they found the images of women, the greater the proportion of their visual attention was allotted toward the male images. Although participants' visual attention patterns remained relatively diffuse, they did indeed align with their self-reported sexual identity/orientation and sexual arousal to the images. This parallels findings in previous studies in which viewing time mirrored sexual attractiveness ratings of individual images, both of which collectively were roughly equal amongst male and female images (e.g., Israel & Strassberg, 2009; Lippa 2012, 2013; Lippa et al., 2010).

Similarly, the more cognitive and affective attraction toward same-sex others that participants endorsed, the more they viewed same-sex images. This connection dovetails with research demonstrating that the category specificity of women's genital arousal (Bouchard et al., 2015; Chivers et al., 2007, 2015; Suschinsky et al., 2017; Timmers et al., 2015) and visual attention (Dawson et al., 2017) varies as a function of degree of attraction to opposite- and same-sex others, regardless of sexual identity. In these studies, women's genital arousal to female sexual stimuli either remained relatively consistent (Chivers et al., 2015) or increased (Bouchard et al., 2015; Timmers et al., 2015) when participants endorsed any degree of same-sex sexual attraction compared to participants who denied any degree of same-sex sexual attraction. Dawson and colleagues (2017) found that exclusively opposite-sex-attracted women's visual attention was initially captured equally quickly by male and female images, whereas women with some degree of same-sex attraction initially oriented more quickly to female images. Although

Jones and Meana (2013) found that heterosexual women's visual attention patterns did not shift (either more towards male or female images) when they underwent a sexual arousal manipulation in the lab, images of nude women may have arousal value for heterosexual women in a sexually neutral state.

Women's diffuse visual attention patterns may be a cognitive corollary to their relatively indiscriminant genital arousal and greater fluidity in sexual attractions and fantasies than seen in men (e.g., Baumeister, 2000; Dickson et al., 2013; Kinnish et al., 2005). An expansive body of literature demonstrates that heterosexual women consistently evidence genital arousal to sexual stimuli, regardless of whether or not the stimuli feature their erotic target (e.g., Chivers et al., 2010; Chivers & Timmers, 2012; Huberman et al., 2015). Converging with the visual attention and genital arousal literature, Baumeister (2000) reviewed a large body of literature suggesting that women's sexual attitudes and behaviors vary across their lifespan in response to a variety of influential sociocultural and situational factors such as their peer, parental, and romantic relationships, as well as culture, religion, and education. Additionally affirming women's greater erotic plasticity are findings that women's sexual behaviors and attractions vary significantly across days and years (Diamond, 2000, 2003, 2005, 2008; Diamond et al., 2017; Dickson et al., 2013; Kinnish et al., 2005; Savin-Williams et al., 2012; Spitzer, 2003), with heterosexual women often self-reporting some same-sex attraction (e.g., Chivers et al., 2015) and/or behavior (e.g., Chandra et al., 2011). Taken together, these results do provide some support for the hypothesis that women's greater sexual fluidity may account for their more diffuse gaze patterns and that sexual fluidity is inherently linked to the more democratic arousability of heterosexual women when compared to men.

Several evolutionary theories have been proposed to explain the relative lack of discrimination in women's arousability. First, Baumeister (2000) suggested that women have a weaker sex drive, allowing them to be flexible in selecting a mate based upon mate availability or ability to satisfy other important goals. Whereas, evolutionarily, men have consistently valued indicators that a mate is reproductively fit, mate characteristics valued by women are more variable depending on the given context. Thus, the ability to become genitally aroused to a variety of stimuli may have allowed women to be flexible in physiologically responding to, and hence mating with, a variety of partners, depending on whatever goals or characteristics are valued at the time (Diamond, 2006; Ponseti & Bosinski, 2010). Second, Kuhle and Radtke (2013) hypothesized that women's sexual fluidity was advantageous to their ability to effectively form intimate bonds with other women through sex. They argued that the ability to form female-female bonds was crucial to obtaining child rearing assistance from un-related women (alloparents) when paternal investment was nonexistent or inadequate. Third, women have always been at risk for unwanted sexual advances from men, whose greater physical strength generally enables them to physically overpower women. Women's greater genital arousability to any sexual stimulus, regardless of subjective reports of arousal, may have been adaptive as a means to reduce injury, and hence risk of death, from non-consensual vaginal penetration (e.g., Chivers et al., 2010; Suschinsky & Lalumière, 2011).

Socioculturally, Fredrickson and Roberts (1997) have postulated that societal value placed on women's physical appearance has led women's bodies to be objectified – that is, dehumanized and viewed as objects serving to gratify others. Evidence suggests that not only do men objectify women, but women objectify themselves and other women as well (Bernard et al., 2012; Strelan & Hargreaves, 2005). Lindner and colleagues (2012) proposed that women

sexually objectify themselves, leading to sexual objectification of and engagement in social comparison with other women, whereby women evaluate how their own sexual desirability compares to that of other women. Perhaps a consequence of sexually objectifying and evaluating other women's sexual desirability is that women develop internalized associations between other women and their sexual value, leading women to subconsciously eroticize and become aroused by female sexual stimuli.

**Identification and Social Comparison as Potential Contributors**

Although social comparison, erotic self-focus, and empathic identification were, overall, not strong predictors of visual attention in this study, there were a couple of findings worthy of further investigation. The degree to which women identified with the female actor was related to visual attention to the female image. Although empathy, as measured in this study, was not associated with visual attention, it appears that the related construct of projective identification does appear to be related to heterosexual women's visual attention toward erotic images of women. This finding provides support for Money and Ehrhardt's (1972) hypothesis that a heterosexual woman derives subjective sexual arousal from imagining herself as the woman – the object of the man's desire – in a sexual scenario. Providing further support, Janssen and colleagues (2003) found that women's subjective sexual arousal ratings were significantly positively correlated with the extent to which they identified with the female actors in audiovisual stimuli. Subjective sexual arousal ratings, particularly ratings of female images, were also positively correlated with identification with the female actor in the current study. Greater projective identification was associated with greater subjective arousal ratings of the female images, both of which were associated with greater visual attention to the female images,

and thus perhaps projective identification is one potential mechanism by which heterosexual women derive arousal value from viewing erotic images of women.

There was also evidence that participants' tendency to make upward appearance-focused comparisons was related to visual attention toward the female images. This provides some support for the hypothesis that women may be visually attending to images of nude women in order to engage in social comparison. Festinger's (1954) social comparison theory postulated that people engage in self-evaluation by means of comparing themselves to others, particularly on characteristics that are relevant to a situation or valued, which can then drive people to improve these characteristics to meet ideal standards. When viewing static erotic images of nude women, it seems reasonable to assume that the relevant and valued characteristics being evaluated are appearance-related. Rodin and colleagues (1984) also asserted that it is relatively common for women to be on the lookout for other women in their environment and when spotted, engage in social comparison. Furthermore, women with greater body dissatisfaction are more likely to engage in upward, appearance-focused comparisons (Leahey et al., 2007; Myers & Crowther, 2009; Myers et al., 2012), and indeed in the current study, upward appearance comparisons were related to increased body surveillance, increased body shame, and decreased body esteem. While we did not find a relationship between visual attention and body surveillance, shame, and esteem, research on the nature of the relationship between body dissatisfaction and visual attention to attractive female models is mixed; perhaps body surveillance, shame, and esteem are less predictive of visual attention and more predictive of tendency toward upward appearance comparisons, which then motivates women to attend to images of women.

**Are women's visual attention patterns generally more diffuse than men's?**

Although there were some significant relationships between the constructs of interest and women's visual attention patterns, many of our measures were surprisingly poor predictors of visual attention. One potential explanation is that perhaps women are naturally more exploratory in their visual attention, and look at all features of a scene more than men do. However, if women's visual attention was inherently diffuse, we would expect that this pattern would remain relatively robust to differences in scene content and other outside influences. Contrary to this hypothesis, research suggests that women do not equally attend to all characteristics of a stimulus. Ju and Johnson (2010) found that women visually attend more to models in an advertisement than to other aspects of the advertisement, including headline and product. Lykins and colleagues (2008) found that men and women equally attended to the contextual aspects of the scenes, and that this was overall a small portion of their visual attention relative to time spent viewing the male or female actors. Furthermore, this differential attention to actors versus context was more striking when men and women viewed erotic images than when they viewed non-erotic images (Lykins et al., 2006, 2008). Additionally, amount of visual attention to various parts of actors' bodies and context varies depending on whether stimuli are erotic or non-erotic (Lykins et al., 2008; Tsujimura et al., 2009). Rupp and Wallen (2007) similarly found that attention was differentially paid to genitals, clothing, and background depending on whether women were taking hormonal contraceptives or were normally cycling. Visual attention to human stimuli also varies based on reported attraction to a stimulus (e.g., Israel & Strassberg, 2009; Dawson et al., 2017), age of a stimulus (Hall, Hogue, & Guo, 2011, 2014), body weight of actors in visual stimuli (Gervais et al., 2013; Holland &Haslam, 2013), and one's own body size (Glauert et al., 2010; Roefs et al., 2008) and satisfaction with one's own body (Blechert et al.,

2009; Cho & Lee, 2013; Cundall & Guo, 2017; Horndasch et al., 2012; Janelle et al., 2009; Jansen et al., 2005; Lykins et al., 2014; Tuschen-Caffier et al., 2015). There is clearly a substantial literature to suggest that women, in fact, do not attend equally to all aspects of a visual stimulus.

**Are gender differences in the visual processing of erotic stimuli reflected in neurological processing of visual stimuli?**

There is mounting evidence that there are subtle differences in processing sexual stimuli occurring at a neurological level. Sabatinelli, Flaisch, Bradley, Fitzsimmons, and Lang (2004) presented men and women with images of families, neutral and angry faces, physical threat, human injury, household objects, and erotic images of couples while visual cortical activity was examined via fMRI. They found that men exhibited greater activation to erotic couple than to family images, whereas activation did not differ for women, and men's activation to erotic couple images was greater than women's activation to couple images; there were no gender differences in activation to the other image categories. They hypothesized that the greater activation in men indicated a bias for visually processing erotic scenes as they have greater reproductive relevance for men than for women. Costa, Braun, and Birbaumer (2003) also found that when viewing images of nude men and nude women, the relationship between ratings of sexual attractiveness and potential amplitude as measured by MEG was larger in men than in women, mirroring the greater concordance between subjective and genital arousal found in men than in women. They hypothesized this finding to reflect men's greater emphasis on physical attractiveness when evaluating potential mates.

In the decade plus since these early studies were published, numerous other brain imaging studies have found differential patterns of activation in men and women's responses to

visual sexual stimuli. For example, Cazzato, Mele, and Urgesi (2014) found that men and women differ in hemispheric symmetry as measured by repetitive transcranial magnetic stimulation (rTMS) when making aesthetic judgments about virtual male and female bodies, concluding that aesthetic processing of male and female bodies is neurologically different in men and women. Cloutier, Heatherton, Whalen, and Kelley (2008) found that activation of areas of the brain involved in reward pathways, as measured by functional magnetic resonance imaging (fMRI), was greater for both men and women when viewing attractive opposite-sex faces than when viewing unattractive opposite-sex faces. However, there were gender differences in activation of the orbital frontal cortex specifically, an area that "has been implicated in reward-based, motivated social behavior" (Cloutier et al., 2008, p. 947), such that men's, but not women's, brain activation in this area was greater to opposite-sex stimuli rated as more attractive. They concluded that this may indicate that attractive opposite-sex stimuli are more rewarding for men than for women. Perhaps then, men are biologically predisposed to allocate greater visual attention toward the most attractive and sexually relevant stimuli, and indeed to spend significantly more time viewing their erotic targets than non-erotic targets. In contrast, women appear to derive less reward from viewing sexual stimuli and visual stimuli are less reproductively relevant, perhaps because mate value is generally tied less to attractiveness for women as it is for men. This may then allow room for a wider variety of factors to additionally influence women's visual attentional resources (such as social comparison or projective identification).

Overall, it appears that the most evidence-based explanation for women's visual attention patterns toward erotic stimuli is that they are, at least in part, a reflection of their greater sexual fluidity and the attendant arousal value of supposedly non-preferred erotic targets. Projective

identification with other women may be part of the sexual fluidity story. Social comparison may play a small role but more research would be needed to have confidence in this hypothesis. In any case, there are a number of limitations which may attenuate the interpretation of findings in this study.

## Limitations

Several limitations of the current research are notable. First, observed power was low for standard regression and MANOVA analyses. While the sample size was adequate to detect a medium effect using standard regression, a larger sample would have been needed to provide enough power to detect small effects. On the other hand, small effects may not be particularly germane to a powerful explanation for the diffuse visual attention patterns of women when viewing erotic stimuli. To improve power in MANOVA, approximately twice as many subjects would have been needed to find an overall effect.

Second, participants completed the self-report measures online, outside of the lab. The rationale for this was largely a matter of practicality, with limited space and time resources to have each participant in the lab for approximately an hour and a half while maintaining participant privacy. Having participants complete the measures outside of the lab also allowed participants to take as much time as needed to complete the measures, as well as to do so in their preferred setting, with the possibility that these two factors would encourage participants to be more thoughtful and honest in their responding to measures. However, this also introduced unknown variability into the completion of self-report measures. Several contextual factors, such as location, amount of privacy, and presence of external distractions, were not controlled for. Additionally, participants had the freedom to complete the self-report measures when convenient for them; while most participants completed them the same day, the number of days

between date of the eye-tracking session and the date of completion of self-report measures ranged from 0-26 days (mean = 1.4). It is possible that variable time between eye-tracking and completion of self-report measures introduced uninterpretable variability in the responses. For example, viewing images of attractive nude men and women may lead to temporary decreases in body esteem (e.g., Cattarin, Thompson, Thomas, & Williams, 2000; Patrick, Neighbors, & Knee, 2004; Posavac, Posavac, & Posavac, 1998; Tiggemann & McGill, 2004), increases in upward comparison (e.g., Patrick et al., 2004), or increases in self-reported sexual arousal.

Finally, several of the self-report measures used were newly created exploratory measures (i.e., the Object of Desire Self-Consciousness-Sexual Fantasy Questionnaire [ODSC-SFQ] and Erotic Self-Focus Experiences Questionnaire [ESFEX]), or may be poor proxies for measuring the construct of interest (i.e., Basic Empathy Scale – Adult). The ODSC-SFQ and ESFEX have each shown initial promise, with both having high internal consistency, appearing to be valid measures of object of desire self-consciousness (ODSC) and erotic self-focus (ESF) constructs, and demonstrating greater ODSC and ESF themes in women than in men (Bogaert et al., 2015; Fertel, 2015). However, these measures are relatively new, with each tapping into novel phenomena, making assessment of construct and convergent validity difficult. Finally, the BES-A is a measure of cognitive and affective components of empathy, namely the ability to feel, understand, and distance oneself from another's emotions. The *ability* to have empathy, though, is a different question than whether one is actively being empathic at any given point in time. Also, empathic/projective identification are not equivalent constructs to general empathy, yet there are no validated direct measures of empathic/ projective identification we are aware of.

## Future Directions

In addition to addressing some of the limitations of this study, there are several avenues for future research. First, this study examined two commonly utilized measures of visual attention – number of fixations and fixation duration on scene regions of interest – with seemingly little relationship between our self-report measures of interest and these two variables. However, several other measures of visual attention have also been examined in sexuality eye-tracking research. Recently, Dawson and colleages (2016, 2017) have examined the amount of time it takes participants to make their first fixation on a scene region and the number of first fixations on a scene region in addition to total number of fixations and fixation duration – the former being measures of initial, automatic attention and the latter being measures of subsequent, controlled attention. They found that women's visual attention differed between these two types of measures, with measures of initial attention being non-category-specific and measures of controlled attention being category-specific. Rieger and colleagues have also concluded that pupillometry is a valid measure of sexual attraction and orientation in men and women (Rieger & Savin-Williams, 2012). Perhaps erotic plasticity/sexual fluidity, social appearance comparison/objectification, erotic self-focus, and empathic identification would be differentially related to measures of initial attention or pupil dilation versus measures of controlled attention; future research should examine these relationships.

Second, future studies might also inquire more directly about participants' experience of viewing erotic stimuli, with particular focus on upward appearance-focused social comparisons and projective identification. Questions related to the constructs of interest in this study can be modeled after those asked in Ju and Johnson (2010) such as "To what extent did you compare any specific body part with the body parts of the woman you saw in the advertisements?" (p.

166) and in Bossio et al. (2014) in which they asked participants to rate the extent to which they endorsed the following: “I imagined myself as an observer of the activities in this film.” (p. 306). Furthermore, Descriptive Experience Sampling (DES; Heavey & Hurlburt, 2008; Hurlburt & Heavey, 2001) might be used while women view erotic stimuli to capture their inner experience while completing the viewing task, with responses later examined for themes related to the aforementioned constructs hypothesized to be related to visual attention patterns. This may reveal new constructs not previously thought to be related. In examining inner experiences of participants while reading of an erotic story collected by Lapping-Carr (2016), a theme of observational v. participatory stance appears to have emerged, suggesting that DES during viewing of erotic stimuli might be a fruitful avenue of exploration.

Lapping-Carr’s findings also suggest that DES may be particularly useful in further exploring projective identification. To our knowledge, the current study is the first to explore projective identification as it relates to objective measures of visual attention. Furthermore, with the exception of Janssen and colleagues (2003), research exploring the relationship between identification and sexual arousal has not examined identification directly, but rather inquired about the extent to which participants have viewed stimuli as an observer and/or a participant. While participant stance has been found to be related to identification with same-sex actors (e.g., Janssen et al., 2003), these do appear to be different constructs. In the current study, identification with the female actor was related to visual attention toward the female actor, while observational and participatory stances were unrelated to visual attention. DES may illuminate how these constructs differ and how they may differentially relate to visual attention and/or sexual arousal.

Lastly, although Rieger and colleagues (2015, 2016) have recently concurrently measured subjective sexual arousal, genital sexual arousal, and pupil dilation, no studies to date have examined visual attention via eye-tracking while simultaneously measuring genital arousal. In addition, no studies have explored changes in visual attention patterns across time, via time analysis. Dawson and colleagues (2016, 2017) have found evidence that women's initial visual attention patterns are different than their subsequent visual attention patterns. It might be worthwhile to simultaneously measure visual attention and genital arousal, and to examine the extent to which these two measures covary across time (perhaps using statistical techniques recommended by Pulverman et al., 2015).

APPENDIX A

MULTIDIMENSIONAL SCALE OF SEXUALITY

Instructions: The following questions refer to situations in which both partners willingly participated.

Please read all of the questions carefully and circle each statement either True (if you feel it applies to you) or False (if you do NOT feel that it applies to you). In regard to questions which refer to your current partner(s), if you are not currently in a relationship, please answer these questions based on your preferred choice of partner(s).

| | | |
|---|---|---|
| 1. | For the most part I am sexually attracted to members of my *same* sex, and to a lesser degree I am sexually attracted to members of the *opposite* sex. | T/F |
| 2. | In the past, I have felt in love with members of the *opposite* sex, but currently I feel in love with members of my *same* sex. | T/F |
| 3. | I have always been sexually active only with members of my *same* sex. | T/F |
| 4. | I have never been aroused by erotic material which features members of either my *same* or *opposite* sex. | T/F |
| 5. | I usually have sexual fantasies or dreams about members of the *opposite* sex, but occasionally I have sexual fantasies or dreams about members of the *same* sex. | T/F |
| 6. | I have always been attracted only to members of the *opposite* sex. | T/F |
| 7. | In general I feel in love with members of my *same* sex, but occasionally I feel in love with members of the *opposite* sex. | T/F |
| 8. | In the past I have engaged in sexual activity with members of the *opposite* sex, but currently I engage in sexual activity only with members of my *same* sex. | T/F |
| 9. | There are periods of time when I find erotic material which features members of my *same* sex more arousing, while at other periods of time I find erotic material which features members of the *opposite* sex more arousing. | T/F |
| 10. | I have always sexually fantasized or dreamed only about members of my *same* sex. | T/F |
| 11. | There are periods of time when I feel more sexually attracted to members of my *same* sex, while at other periods of time I feel more sexually attracted to members of the *opposite* sex. | T/F |
| 12. | There are periods of time when I feel more in love with members of my *same* sex, while at other periods of time I feel more in love with members of the *opposite* sex. | T/F |
| 13. | I have always been sexually active only with members of the *opposite* sex. | T/F |
| 14. | In the past I was aroused by erotic material which featured members of the *opposite* sex, but currently I am aroused only by erotic material which features members of my *same* sex. | T/F |
| 15. | I have always sexually fantasized or dreamed only about members of the *opposite* sex. | T/F |

16. In the past I was sexually attracted to members of my *same* sex, but currently I have an interest only in *opposite* sex partners. T/F
17. I currently feel equally in love with members of *both* sexes. T/F
18. Most of my current sexual activity involves members of the *opposite* sex, but occasionally I am sexually active with members of my *same* sex. T/F
19. I am generally aroused by erotic material which features members of the *opposite* sex, and to a lesser degree I am aroused by erotic material which features members of my *same* sex. T/F
20. There are periods of time when I sexually fantasize or dream mainly about members of my *same* sex, while at other periods of time I sexually fantasize or dream mainly about members of the *opposite* sex. T/F
21. For the most part I am attracted to members of the *opposite* sex, and to a lesser degree I am sexually attracted to members of my *same* sex. T/F
22. I have never felt in love with members of either my *same* or *opposite* sex. T/F
23. In the past I have engaged in sexual activity with members of my *same* sex, but currently I engage in sexual activity only with *opposite* sex partners. T/F
24. I have always been aroused only by erotic material which features members of the *opposite* sex. T/F
25. I have never sexually fantasized or dreamed about members of either my *same* or *opposite* sex. T/F
26. I have always been attracted only to members of my *same* sex. T/F
27. In the past I have felt in love with members of my *same* sex, but currently I only feel in love with members of the *opposite* sex. T/F
28. I engage in sexual activity with members of *one sex* for a period of months or years, followed by sexual activity with members of the *other sex* for the next few months or years. T/F
29. I am generally aroused by erotic material which features members of my *same* sex, and to a lesser degree I am aroused by erotic material which features members of the *opposite* sex. T/F
30. In the past I had sexual fantasies or dreams about members of my *same* sex, but currently I have fantasies or dreams only about members of the *opposite* sex. T/F
31. I am not sexually attracted to members of either my *same* or *opposite* sex. T/F
32. I have always felt in love with members of my *same* sex only. T/F
33. I engage in sexual activity with members of *both* sexes equally frequently, on a fairly regular basis. T/F
34. In the past I was aroused by erotic material which featured members of my same sex, but currently I am aroused only by erotic material which features members of the *opposite* sex. T/F
35. I currently have about equal numbers of sexual fantasies or dreams about members of my *same* and *opposite* sex. T/F
36. In the past I was sexually attracted to members of the *opposite* sex, but currently I have an interest only in *same* sex partners. T/F
37. In general I feel in love with members of the *opposite* sex, but occasionally I feel in love with members of my *same* sex. T/F

| | | |
|---|---|---|
| 38. | I have never engaged in sexual activity with members of my *same* or *opposite* sex. | T/F |
| 39. | I am currently equally aroused by erotic material which features members of my *same* sex, as well as erotic material which features members of the *opposite* sex. | T/F |
| 40. | In the past I had sexual fantasies or dreams about members of the *opposite* sex, but currently I have fantasies or dreams only about members of the *same* sex. | T/F |
| 41. | I currently feel equally sexually attracted to members of *both* sexes. | T/F |
| 42. | I have always felt in love with members of the *opposite* sex only. | T/F |
| 43. | Most of my current sexual activity involves members of my *same* sex, but occasionally I am sexually active with members of the *opposite* sex. | T/F |
| 44. | I have always been aroused only by erotic material which features members of my *same* sex. | T/F |
| 45. | I usually have sexual fantasies or dreams about members of the *same* sex, but occasionally I have sexual fantasies or dreams about members of the *opposite* sex. | T/F |

APPENDIX B

OBJECTIFIED BODY CONSCIOUSNESS SCALE

Instructions: Please choose the most appropriate response for the following items.

| Strongly disagree | | | Neither agree nor disagree | | | Strongly agree | Does not apply |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | I rarely think about how I look. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 2. | When I can't control my weight, I feel like something must be wrong with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 3. | I think it is more important that my clothes are comfortable than whether they look good on me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 4. | I think a person is pretty much stuck with the looks they are born with. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 5. | I feel ashamed of myself when I haven't made the effort to look my best. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 6. | A large part of being in shape is having that kind of body in the first place. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 7. | I think more about how my body feels than how my body looks. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 8. | I feel like I must be a bad person when I don't look as good as I could. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 9. | I rarely compare how I look with how other people look. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 10. | I think a person can look pretty much how they want to if they are willing to work at it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 11. | I would be ashamed for people to know what I really weigh. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 12. | I really don't think I have much control over how my body looks. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 13. | Even when I can't control my weight, I think I'm an okay person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 14. | During the day, I think about how I look many times. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 15. | I never worry that something is wrong with me when I am not exercising as much as I should. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 16. | I often worry about whether the clothes I am wearing make me look good. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 17. | When I'm not exercising enough, I question whether I am a good enough person. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 18. | I rarely worry about how I look to other people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 19. | I think a person's weight is mostly determined | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | by the genes they are born with. | | | | | | | | |
| 20. | I am more concerned with what my body can do than how it looks. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 21. | It doesn't matter how hard I try to change my weight, it's probably always going to be about the same. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 22. | When I'm not the size I think I should be, I feel ashamed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 23. | I can weigh what I'm supposed to when I try hard enough. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |
| 24. | The shape you are in depends mostly on your genes. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Na |

APPENDIX C

BODY ESTEEM SCALE

Instructions: On this page are listed a number of body parts and functions. Please read each item and indicate how you feel about this part or function of your own body using the following scale:

1 = Have strong negative feelings
2 = Have moderate negative feelings
3 = Have no feeling one way or the other
4 = Have moderate positive feelings
5 = Have strong positive feelings

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | Body scent | 1 | 2 | 3 | 4 | 5 |
| 2. | Appetite | 1 | 2 | 3 | 4 | 5 |
| 3. | Nose | 1 | 2 | 3 | 4 | 5 |
| 4. | Physical stamina | 1 | 2 | 3 | 4 | 5 |
| 5. | Reflexes | 1 | 2 | 3 | 4 | 5 |
| 6. | Lips | 1 | 2 | 3 | 4 | 5 |
| 7. | Muscular strength | 1 | 2 | 3 | 4 | 5 |
| 8. | Waist | 1 | 2 | 3 | 4 | 5 |
| 9. | Energy level | 1 | 2 | 3 | 4 | 5 |
| 10. | Thighs | 1 | 2 | 3 | 4 | 5 |
| 11. | Ears | 1 | 2 | 3 | 4 | 5 |
| 12. | Biceps | 1 | 2 | 3 | 4 | 5 |
| 13. | Chin | 1 | 2 | 3 | 4 | 5 |
| 14. | Body build | 1 | 2 | 3 | 4 | 5 |
| 15. | Physical coordination | 1 | 2 | 3 | 4 | 5 |
| 16. | Buttocks | 1 | 2 | 3 | 4 | 5 |
| 17. | Agility | 1 | 2 | 3 | 4 | 5 |
| 18. | Width of shoulders | 1 | 2 | 3 | 4 | 5 |
| 19. | Arms | 1 | 2 | 3 | 4 | 5 |
| 20. | Chest or breasts | 1 | 2 | 3 | 4 | 5 |
| 21. | Appearance of eyes | 1 | 2 | 3 | 4 | 5 |
| 22. | Cheeks/cheekbones | 1 | 2 | 3 | 4 | 5 |
| 23. | Hips | 1 | 2 | 3 | 4 | 5 |
| 24. | Legs | 1 | 2 | 3 | 4 | 5 |
| 25. | Figure or physique | 1 | 2 | 3 | 4 | 5 |
| 26. | Sex drive | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 27. | Feet | 1 | 2 | 3 | 4 | 5 |
| 28. | Sex organs | 1 | 2 | 3 | 4 | 5 |
| 29. | Appearance of stomach | 1 | 2 | 3 | 4 | 5 |
| 30. | Health | 1 | 2 | 3 | 4 | 5 |
| 31. | Sex activities | 1 | 2 | 3 | 4 | 5 |
| 32. | Body hair | 1 | 2 | 3 | 4 | 5 |
| 33. | Physical condition | 1 | 2 | 3 | 4 | 5 |
| 34. | Face | 1 | 2 | 3 | 4 | 5 |
| 35. | Weight | 1 | 2 | 3 | 4 | 5 |

APPENDIX D

UPWARD AND DOWNWARD APPEARANCE COMPARISON SCALES

Instructions: Please rate to what extent you agree or disagree with the following items.

| Strongly Disagree | Disagree | Neither Agree Nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | I compare myself to those who are better looking than me rather than those who are not. | 1 | 2 | 3 | 4 | 5 |
| 2. | I tend to compare my own physical attractiveness to that of magazine models. | 1 | 2 | 3 | 4 | 5 |
| 3. | I find myself thinking about whether my own appearance compares well with models and movie stars. | 1 | 2 | 3 | 4 | 5 |
| 4. | At the beach or athletic events (sports, gym, etc.) I wonder if my body is as attractive as the people I see there with very attractive bodies. | 1 | 2 | 3 | 4 | 5 |
| 5. | I tend to compare myself to people I think look better than me. | 1 | 2 | 3 | 4 | 5 |
| 6. | When I see a person with a great body, I tend to wonder how I ‘match up’ with them. | 1 | 2 | 3 | 4 | 5 |
| 7. | When I see good-looking people, I wonder how I compare to them. | 1 | 2 | 3 | 4 | 5 |
| 8. | At parties or other social events, I compare my physical appearance to the physical appearance of the very attractive people. | 1 | 2 | 3 | 4 | 5 |
| 9. | I find myself comparing my appearance with people who are better looking than me. | 1 | 2 | 3 | 4 | 5 |
| 10. | I compare my body to people who have a better body than me. | 1 | 2 | 3 | 4 | 5 |
| 11. | When I see a person who is physically unattractive I think about how my body compares to theirs. | 1 | 2 | 3 | 4 | 5 |
| 12. | I tend to compare my body to those who have below average bodies. | 1 | 2 | 3 | 4 | 5 |
| 13. | At the beach, gym, or sporting events I compare my body to those with less athletic bodies. | 1 | 2 | 3 | 4 | 5 |
| 14. | I compare myself to people less good looking than me. | 1 | 2 | 3 | 4 | 5 |
| 15. | I think about how attractive my body is compared to overweight people. | 1 | 2 | 3 | 4 | 5 |
| 16. | At parties I often compare my looks to the looks of unattractive people. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 17. | I often compare myself to those who are less physically attractive. | 1 | 2 | 3 | 4 | 5 |
| 18. | I tend to compare my physical appearance with people whose bodies are not as physically appealing. | 1 | 2 | 3 | 4 | 5 |

APPENDIX E

OBJECT OF DESIRE SELF-CONSCIOUSNESS – SENTENCE COMPLETION

Instructions: Imagine yourself as the main character in the following stories, and when you see underlined words in **bold**, choose the word or phrase that would best describe your feelings, actions, and behavior in the situation. **Circle** the word or phrase that best suits your decision. Note that these scenarios specify a partner of the opposite sex. If you are more sexually attracted to a partner of the same sex, please mentally substitute female terms and pronouns.

Scenario 1

There is a guy in one of my classes who I liked right away because he is so (**smart** OR **funny** OR **good looking** OR **friendly**) and I find it appealing that (**he seems to like me** OR **he's playing hard to get** OR **I have no idea how he feels about me**). If I had to guess, I'd say he (**likes my body** OR **likes my personality** OR **doesn't like me**). I'm really interested in him, so today I'm going to wear something that makes me look really (**sexy** OR **rich** OR **stylish**). I've been thinking about this guy all morning and now I'm feeling really (**sexy** OR **horny**).

Scenario 2

My partner has planned a special weekend getaway for just the two of us. We have a romantic candlelight dinner and linger over our drinks. The sexual tension is building for me because (**he is incredibly hot** OR **it is obvious he thinks I'm incredibly hot**). Before long, the two of us are in bed, and because I'm feeling really (**hot** OR **turned on**), I start (**taking off his clothes** OR **taking off my clothes**). I begin to get aroused by (**the sight of my partner's body** OR **the way my partner looks at my body**). As events progress, I'm becoming increasingly turned on by (**the desire for my partner** OR **the desire I am arousing in my partner**). My partner and I have exciting sex and this makes me feel really close to him. Afterwards, I feel satisfied and (**glad my partner still gets so turned on by me** OR **glad that I still get so turned by my partner** OR **glad we are still so compatible together**).

Scenario 3

My partner and I go to a party where there are several other couples and single friends we know. I know there will be some attractive men at the party so I decide to (**wear clothing that shows off my body** OR **wear clothing that makes me look successful and rich**). After having a few drinks, I begin (**to notice that attractive guys are checking me out** OR **to check out attractive guys**). I begin to become aroused by (**how people are responding to the way I look** OR **how good other people look**) and this makes me feel turned on because (**I know I am still desirable** OR **I am fantasizing about having sex with someone at the party**). When we leave the party I notice that I am feeling (**hot** OR **horny**). When we get home, I initiate sex. In the end, I'm glad we went to the party because (**it made me feel sexy and desired** OR **I got to see lots of attractive people**).

Scenario 4

My girlfriends and I go out to the bar for a night on the town. After probably a few drinks too many, I notice an attractive guy and (**start dancing in a sexy way to get his attention** OR **watch how sexy he looks when he dances**). I start to get really turned on by (**looking at his body** OR **the way he's looking at my body**). We continue to flirt all night and (**I make sure he gets a good look at my body** OR **I make sure I get a good look at his body**). We go back to

his place I start (**removing my clothes** OR **removing his clothes**) to turn him on. At this point I feel so (**sexy** OR **turned on)**. (**I tell him how good-looking he is** OR **He tells me how good-looking I am**) and we have lusty and exciting sex and afterwards I find all my clothes and stumble home. It was fun, but nothing more will ever come of it.

APPENDIX F

OBJECT OF DESIRE SELF-CONSCIOUSNESS – SEXUAL FANTASY QUESTIONNAIRE

Instructions: Most men and women have sexual fantasies. Using the following scale, please evaluate how sexually exciting each of the items would be to you in the context of a sexual fantasy. Circle the number that best represents your level of excitement in the space beside the item. Note that these scenarios specify a partner of the opposite sex. If you are more sexually attracted to a partner of the same sex, please mentally substitute female terms and pronouns.

| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|---|---|---|---|---|---|---|
| **Not at all Exciting** | | | **Somewhat Exciting** | | | **Extremely Exciting** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Having sex with a very attractive stranger. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. My partner telling me how good-looking and sexy I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. Having sex with two or more very attractive partners at the same time | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. Imagining that I observe myself or others having sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. Having casual sex with a person who I just met and who finds me irresistible. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I imagine that an older, experienced partner is attracted to me because of my youthful appearance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. Being forced to surrender to someone who is overcome with lust for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Dating an exotic dancer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. A special man is devoted to me and showers me with love and attention. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. Overpowering or forcing another to surrender because he is so irresistible. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. My partner tells me what he wants me to do to him during sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. Lusting after a hot guy who is teasing and arousing me with his body. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. Being passive and submissive to someone who wants my body. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. Being a promiscuous person who has many irresistible sexual partners. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. Exerting dominance and control over a partner who I am highly attracted to. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. Showing off my body to tease and arouse onlookers who lust after me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 17. Using force or humiliating a person who desires me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. Pleasuring many other people while having group sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. My partner showing me how much he desires my body. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. I sweep a man off his feet and teach him all about romance and sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. Having sex with a stranger who is very attracted to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. Being overpowered or forced to surrender because I am so irresistible. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. Dressing in sexy, transparent underwear for my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. Having sex with two or more partners, who are very attracted to me, at the same time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. Giving sexual pleasure to many people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. Talking dirty to my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. Revealing my body to an attractive stranger. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. Exerting dominance and control over a partner who is highly attracted to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. Teasing a man (or men) until I can no longer contain my sexual desire for him/them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. Being the centre of attention while having group sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. Being passive and submissive to someone whose body I want. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. Having sex with many men, all of them overcome with lust for my body. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. Being forced to surrender to someone while I'm overcome with lust for him. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. Being a promiscuous person who attracts the attention of many partners with my irresistibility. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. Undressing for my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. Using force or humiliating a person who I desire. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 37. Being an exotic dancer. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 38. Having sex in a different place like a car, hotel, beach, woods. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 39. Exerting dominance and control over a very desirable partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 40. I am devoted to a special man and shower him with love and devotion. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 41. Having casual sex with a person I just met and find irresistible. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 42. Receiving sexual pleasure from many people. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 43. My partner tells me what he wants to do to me during sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 44. I imagine that I am attracted to a sexual partner because of his greater age and experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 45. Men talk about how sexy and irresistible I am before forcing me to sexually pleasure them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 46. Showing my partner how much I desire his body. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 47. Having sex with many men, all of whom are very attractive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 48. Teasing a man (or men) until he is consumed with sexual desire for me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 49. Having an attractive stranger reveal his body to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 50. A man sweeps me off my feet and teaches me all about romance and sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 51. Having anal intercourse. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 52. Having sex with my current partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 53. Watching my partner undress. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 54. Feeling affection and emotional connection while having sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 55. Exerting dominance and control over a partner who finds me very desirable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 56. Having sex without making eye contact. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 57. Taking the initiative and dominant role while having sex. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 58. Telling my partner how good-looking and sexy he is. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 59. Reliving a previous sexual experience. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 60. Being forced to sexually pleasure attractive men. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 61. Imagining my partner in sexy underwear. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 62. Pretending that I am doing something wicked or forbidden. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

APPENDIX G

EROTIC SELF-FOCUS EXPERIENCES QUESTIONNAIRE

**Sexual Experiences and Perceptions Questionnaire**

This questionnaire is designed to assess different aspects of the sexuality of heterosexual men and women. Please answer as honestly as possible. All possible answers fall well within the range of how heterosexual men and women feel and respond.

Fantasies

The following questions refer to your heterosexual fantasies. For each item, please indicate the extent to which the statement is true to your experience. Please answer every question regardless of your gender.

I appear in my sexual fantasies.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I focus on what the woman is experiencing in the fantasy.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I focus on what the man is experiencing in the fantasy.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

In my fantasies, I focus on how the man looks.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

In my fantasies, I focus on how the woman looks.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I have fantasies with multiple men and one woman.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I have fantasies with multiple women and one man.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

In my fantasies, my gaze is on the woman.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

In my fantasies, my gaze is on the man.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I alternate gaze in my fantasies (sometimes my gaze is on the man and sometimes on the woman in the same fantasy).

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I fantasize about receiving sexual pleasure from another person or persons.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I fantasize about giving sexual pleasure to another person or persons.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

My fantasized sexual partner(s) is an identifiable person(s) (e.g. a current or ex-partner, a celebrity, a movie character, a co-worker, a specific desired partner)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

My partner(s) in my sexual fantasies is not an identifiable person(s) (e.g. they are a silhouette, an anonymous figure)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I fantasize from my point of view (looking through my own eyes)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I fantasize from my partner(s) point of view (looking through my partner(s) eyes)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

I fantasize from an observer's perspective, as if I am outside of my body watching myself having sex

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never or Seldom | | | Some of the time | | | Often |

Getting in the Mood for Sex

When you are getting ready for a date with someone you are attracted to or for an encounter with your partner that is likely to result in sex, to what extent do the following activities help get you in the mood for sex.

Grooming

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Looking at myself in the mirror naked

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Picking out attractive undergarments (briefs or panties)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Looking at myself in the mirror in my undergarments

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Applying lotions (body lotion or aftershave)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Brushing and arranging hair

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Applying a fragrance

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Choosing what to wear

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Looking at myself in the mirror when I am dressed and ready to go

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Please answer the following questions:

How important to my sexual desire and arousal is the extent to which I feel sexy and desirable?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

If I do not feel sexy or desirable at any given moment, to what extent does that interfere with my sexual arousal when having sex with someone who desires me?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

During sex, how much of a turn on is it for me to think of or imagine how I look as I am having sex?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

During sex, how focused am I on how I look versus on how my partner looks?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Very much focused on partner | | | Equally focused on self and partner | | | Very much focused on me |

During sex, how focused am I on my arousal versus my partner's arousal?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Very much focused on partner's arousal | | | Equally focused on my arousal and that of my partner | | | Very much focused on my arousal |

During sex, how focused am I on how I generally feel versus how my partner generally feels?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Very much focused on how my partner feels | | | Equally focused on how I feel and how my partner feels | | | Very much focused on how I feel |

During sex, how often do I touch my own body?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Never | | | Sometimes | | | Often |

How arousing do I find my own vocalizations during sex? (e.g., sounds I make when having sex)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

How arousing do I find my partner's vocalizations during sex? (e.g., sounds my partner makes when having sex)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

During sex, I focus my attention on myself in order to elevate or maintain my arousal.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

During sex I focus my attention on my partner in order to elevate or maintain my arousal.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

(*Question presented only to women*) Does the very thought of being a woman turn me on?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

(*Question presented only to men*) Does the very thought of being a man turn me on?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

How arousing do I find male sexual vocalizations? (e.g., sounds a man makes when having sex)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

How arousing do I find female sexual vocalizations? ( e.g., sounds a woman makes when having sex)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Would I want to have sex with me?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Definitely No | | | Don't know | | | Definitely Yes |

If I were watching myself having sex with an opposite sex partner in a mirror (or a video), how much of the time do I think I would be looking at myself versus my partner?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Looking mostly at partner | | | Looking equally at self and partner | | | Looking mostly at self |

How arousing do I think I would find a video of my partner masturbating?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

How arousing do I think I would find a video of myself masturbating?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

If I were to go to a strip club, how arousing would I find the following scenarios?

Women stripping

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Men stripping

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

Men and women stripping together

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

How arousing is the fantasy of stripping in front of many members of the opposite sex?

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Not at all | | | Some | | | Very much |

APPENDIX H

BASIC EMPATHY SCALE – ADULT

Instructions: Please rate to what extent you agree or disagree with the following items.

| Strongly Disagree | Disagree | Neither Agree Nor Disagree | Agree | Strongly Agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | My friends' emotions don't affect me much. | 1 | 2 | 3 | 4 | 5 |
| 2. | After being with a friend who is sad about something, I usually feel sad. | 1 | 2 | 3 | 4 | 5 |
| 3. | I can understand my friend's happiness when she/he does well at something. | 1 | 2 | 3 | 4 | 5 |
| 4. | I get frightened when I watch characters in a good scary movie. | 1 | 2 | 3 | 4 | 5 |
| 5. | I get caught up in other people's feelings easily. | 1 | 2 | 3 | 4 | 5 |
| 6. | I find it hard to know when my friends are frightened. | 1 | 2 | 3 | 4 | 5 |
| 7. | I don't become sad when I see other people crying. | 1 | 2 | 3 | 4 | 5 |
| 8. | Other people's feelings don't bother me at all. | 1 | 2 | 3 | 4 | 5 |
| 9. | When someone is feeling 'down' I can usually understand how they feel. | 1 | 2 | 3 | 4 | 5 |
| 10. | I can usually work out when my friends are scared. | 1 | 2 | 3 | 4 | 5 |
| 11. | I often become sad when watching sad things on TV or in films. | 1 | 2 | 3 | 4 | 5 |
| 12. | I can often understand how people are feeling even before they tell me. | 1 | 2 | 3 | 4 | 5 |
| 13. | Seeing a person who has been angered has no effect on my feelings. | 1 | 2 | 3 | 4 | 5 |
| 14. | I can usually work out when people are cheerful. | 1 | 2 | 3 | 4 | 5 |
| 15. | I tend to feel scared when I am with friends who are afraid. | 1 | 2 | 3 | 4 | 5 |
| 16. | I can usually realize quickly when a friend is angry. | 1 | 2 | 3 | 4 | 5 |
| 17. | I often get swept up in my friends' feelings. | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 18. | My friends’ unhappiness doesn’t make me feel anything. | 1 | 2 | 3 | 4 | 5 |
| 19. | I am not usually aware of my friends’ feelings. | 1 | 2 | 3 | 4 | 5 |
| 20. | I have trouble figuring out when my friends are happy. | 1 | 2 | 3 | 4 | 5 |

APPENDIX I

DEMOGRAPHIC QUESTIONNAIRE

Date: _____

Participant Code: _____

1. What is your age? _____

2. What is your ethnicity?
    a. Asian
    b. Black/African American
    c. White/Caucasian
    d. Hispanic/Latina
    e. Native American
    f. Pacific Islander
    g. Other: (please specify) _____

3. What is your primary language?
    a. English
    b. Spanish
    c. Other: (please specify) _____

4. What is your current religious affiliation?
    a. Catholic
    b. Christian
    c. Jewish
    d. Mormon
    e. Muslim
    f. None
    g. Other: (please specify) _____

5. What is the highest level of education you have completed?
    a. High school degree/GED
    b. Some college
    c. Associate's degree
    d. Bachelor's degree
    e. Some graduate school
    f. Master's degree
    g. Doctoral-level degree

6. What is your approximate annual household income?
    a. Up to $10,000
    b. $10,000-$20,000
    c. $20,000-$30,000
    d. $30,000-$40,000
    e. $40,000-$50,000
    f. $50,000-$60,000
    g. Over $60,000

7. Are you using a hormonal contraceptive (e.g., the pill, patch, ring)?
    a. Yes
    b. No

8. Do you have regular menstrual periods?
    a. Yes
    b. No

9. What was the date of the first day of your last period? (Feel free to check your calendar if you marked it down or, if not, give us an approximation)

    Day: _____ Month:_____

10. What is the average length of your menstrual cycle? That is, how many days typically pass between the first day of your period one month, and the first day of your period the next month? If you are unsure, give us an approximation.

    _____

11. What is your height? _____

12. What is your current weight? _____

13. Have you ever had sexual intercourse?
    a. Yes
    b. No

    If yes, at what age did you first have sexual intercourse? _____yrs

14. How many sexual partners have you had in your lifetime?
    a. 0
    b. 1-2
    c. 3-5
    d. 5-7
    e. 8-10
    f. More than 10

15. What is your current relationship status?
    a. Single, not dating
    b. Single, dating
    c. Committed relationship, not cohabiting
    d. Committed relationship, cohabiting
    e. Married
    f. Separated/divorced
    g. Widowed

16. In the past year, how often have you intentionally accessed visual material (e.g., magazines, videos, internet) of a sexual nature (e.g., pornography or erotica)?
    a. Every day
    b. A few times a week
    c. Once a week
    d. Once every two weeks
    e. Once a month
    f. Once every few months
    g. Once every 6 months
    h. Once a year
    i. Never

17. Which of the following best describes your feelings toward visual material of a sexual nature (e.g., pornography or erotica)?
    a. Very much like
    b. Like
    c. Somewhat like
    d. Undecided
    e. Somewhat dislike
    f. Dislike
    g. Very much dislike

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Dissertation Title: Same-Sex Focus in the Visual Attention of Heterosexual Women: An Investigation of Potential Explanations

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