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Visual attention to erotic stimuli in androphilic male-to-female transsexuals

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VISUAL ATTENTION TO EROTIC STIMULI IN ANDROPHILIC
MALE-TO-FEMALE TRANSSEXUALS

by

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A dissertation submitted in partial fulfillment of
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ABSTRACT

Visual Attention to Erotic Stimuli in Androphilic Male-to-Female Transsexuals

by

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The present study investigated sex differences in visual attention to erotic stimuli by comparing three groups of individuals: heterosexual men, heterosexual women, and androphilic MtF transsexuals. Twenty men, 20 women and 13 MtF transsexuals were shown 10 split-screen slides, each featuring one nude erotic photo of a man shown on half of the screen and one nude erotic photo of a woman shown on the other half of the screen. Eye movements were tracked as participants viewed the slides. All participants were heterosexual (Kinsey 0-1) relative to gender identity, thus erotic targets for natal men were nude women in the photos, and erotic targets for women and MtF transsexuals were nude men. With regard to erotic targets, men and MtF transsexuals differed marginally from each other in how long they looked at them ($p = .050$), but both groups looked longer at erotic targets than did women ($p < .001$, $p = .015$, respectively). With regard to non-erotic targets, women looked longer at them than did men ($p < .001$) or MtF transsexuals ($p < .001$), and men and MtF transsexuals did not differ in non-erotic target looking times ($p = .084$). Results replicated Lykins, Meana and Strauss (2008) in that heterosexual men evidenced a category-specific visual preference for their erotic targets whereas women did not. Moreover, androphilic MtF transsexuals, like men, were found to visually attend significantly more to their erotic targets (men) than to their non-

erotic targets (women), revealing a category-specific visual attention pattern to sexual stimuli. This finding suggests that cognitive processing in response to sexual stimuli, at least at the level of visual attention, may be rooted in natal sex. Results are discussed in terms of their implications for different theories of MtF transsexuality.

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Even after all this time

the sun never says to the earth,

"You owe me."

Look what happens with a love like that,

It lights the whole sky.

--Kabir

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CHAPTER 1

INTRODUCTION

An intense debate smolders in the study of the fundamental nature of male-to-female (MtF) transsexualism. The prevailing theory, developed by Ray Blanchard, posits two essential types of MtF transsexuals: homosexual and autogynephilic (Blanchard, 1989b; 2005). Homosexual transsexuals are sexually attracted to biological males and seek to become women so that their bodies are congruent with their female gender identity. In contrast, autogynephilic transsexuals are heterosexual males who become sexually aroused by the notion of being a woman and seek to become women to fulfill this erotic drive. There is substantial empirical and phenomenological support for this typology of MtF transsexualism, and the concept of autogynephilia currently appears in the Gender Identity Disorder (GID) description in the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV).

However, many clinicians and activists have argued that Blanchard's dichotomous classification scheme—particularly the theory of autogynephilia—is an inaccurate, rigid, and even cruel conceptualization of MtF transsexualism (Dreger, 2008). Many MtF transsexuals do not appreciate being characterized as autogynephilic as they feel it relegates a complex struggle with sexuality and gender identity to the status of an extreme and bizarre sexual fetish. To further complicate matters, many MtF transsexuals believe they could be denied sex reassignment surgery if they disclose their erotic motivations to become women; being a woman trapped in a man's body is widely believed to be the more "legitimate" reason for obtaining sex reassignment surgery rather

than wanting surgery because of sexual arousal to the thought of having a vagina (Bailey, 2003).

Beneath the emotion that drives much of the debate over autogynephilia lie a host of unanswered questions about its subtler characteristics. One key question is this: Is autogynephilia the core feature of a distinct type of transsexualism, or is it a form of experience that some transsexuals have only some of the time? To date, most empirical data on autogynephilia have been derived from questionnaires or narratives. For example, the most widely used question to ascertain autogynephilia reads, “Have you ever become sexually aroused while picturing yourself having a nude female body, or with certain features of the nude female form?” (Blanchard, 1989b). If a MtF transsexual endorses the item, she is thought to be autogynephilic; if not, she is considered homosexual (Bailey, 2003). Although quick, self-report items such as this have successfully captured broad differences in transsexual experience, the data derived are prone to methodological biases (i.e., social desirability, memory, and item-construction biases) and do not tell us much about the subtler characteristics of transsexualism.

One research method that has shown great promise in tapping information regarding sexual interest at a more reliable level than self-report is eye-tracking (Lykins, Meana, & Kambe, 2006; Lykins, Meana, & Strauss, 2008; Rupp & Wallen, 2007; 2008). Eye-tracking devices capture gaze patterns in response to visual stimuli by logging the number of fixations points (where the eye lands) and gaze duration at those fixation points (how long the eye remains there) at a rate so fast (250 cycles per second) that conscious interference is difficult. Because visual attention is known to have a significant impact on cognitive information processing (Henderson & Hollingworth, 1999) and is

frequently operational in sexual arousal (i.e., pornography), eye-tracking has emerged as a useful tool in the study of sexual information processing. Previous research exploring visual attention patterns in response to sexual stimuli have established that 1) eye-tracking can reliably capture differences in visual attention patterns in response to erotic and non-erotic stimuli (Lykins, Meana, & Kambe, 2006), and 2) eye-tracking can reliably capture differences between men and women in their visual attention patterns in response to erotic stimuli (Lykins, Meana, & Strauss, 2008).

The present study will use eye-tracking to explore the visual attention patterns of MtF transsexuals in response to erotic stimuli and compare that to the visual attention patterns of men and women. In simple terms, when shown erotic photos, do MtF transsexuals look at the same things men do, the same things women do, or do they exhibit an altogether different visual attention pattern? We further plan to investigate any differentiating features between the patterns which may be found within subgroups of MtF transsexuals (i.e., androphilic and autogynephilic). Although the present study will by no means settle the autogynephilia debate, we hope to shine a new ray of light into the arena and derive a finer-grained understanding of the nature of sexual interest in MtF transsexualism.

CHAPTER 2

LITERATURE REVIEW

What is Transsexualism?

Definition and Classification

Transsexualism is an abiding desire and active striving permanently to embody the opposite sex of one's birth. A male-to-female (MtF) transsexual is born a biological male but wishes to be and takes steps toward living full-time as a female; likewise, a female-to-male (FtM) transsexual is born a biological female but wishes to be and takes steps toward living as a full-time male. The term transsexual is applied specifically to persons who seek permanently to transform themselves, often including their genitalia, into the opposite sex by use of hormones and/or via sex reassignment surgery (SRS). Transsexual is a narrower term than transgender, which encompasses all persons who experience feelings of cross-gender identity, including those who do not live permanently or fully as the opposite sex. Thus transsexuals are transgendered persons who are so deeply convicted in their cross-gender identity that they are compelled to change their behaviors, appearance, and bodies to align with that identity (American Psychological Association, 2006).

There is debate as to whether or not transsexualism represents a form of psychopathology. Some transgender activists disagree with conceptualizing transsexualism as a clinical disorder, arguing that the psychological distress that is sometimes evident can be more easily attributed to social stigma and its consequence than to intrinsic pathology (Meyer-Bahlburg, 2009; Seil, 2001). Currently, within the field of clinical psychology, transsexualism is considered to be a diagnosable condition

characterized by gender dysphoria, or the subjective feeling of incongruence with one's birth sex (Fisk, 1974). The *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition—text revised, (DSM-IV-TR: American Psychiatric Association, 2000) refers to transsexualism as a Gender Identity Disorder (GID) and the *International Classification of Diseases*, tenth edition, (ICD-10: World Health Organization, 1992) simply uses the term Transsexualism. Both classification systems cite three requisite criteria for diagnosis: cross-gender identification, discomfort with natal sex, and desire to alter appearance, behavior, and body to match that of the opposite sex (Table 1).

There are also conflicting views regarding the frequency of co-occurring psychopathology with transsexualism/GID. Based on clinical evidence, Levine (2009) has suggested that most gender patients suffer from multiple forms of psychopathology in addition to gender dysphoria, and Lawrence (2008a) reviewed empirical evidence to conclude that Axis I disorders, substance abuse, and personality disorders do occur more frequently in persons with gender identity disorders than in the general population. However, other researchers have found that transsexualism/GID does not necessarily indicate the presence of co-morbid psychopathology. For example, Gómez-Gil, Vidal-Hagemijer, and Salamero (2008) examined MMPI-2 characteristics in 163 transsexuals formally diagnosed with GID and found no significant elevations in mean T scores on any scale, other than a moderate increase on the Mf scale. Moreover, this study found that transsexuals who were further along in the sex-reassignment process were found to have significantly lower T scores on several scales than those in earlier stages of the transition process, suggesting that becoming biologically congruent with psychological gender identity ameliorates psychological distress.

The Gómez-Gil et al. (2008) findings corroborate those from an earlier study conducted by Cole, O'Boyle, Emory, and Meyer (1997) in which 435 gender dysphoric patients were assessed for psychopathology via in-depth clinical interview. Fewer than 10% of the Cole et al. (1997) participants suffered any form of mental illness and, moreover, the MMPI was administered to 137 of the 435 study participants and all yielded psychopathology-free MMPI profiles. Both Gómez-Gil et al. (2008) and Cole et al. (1997) seem to indicate that transsexualism does not inherently feature psychopathology, and take the perspective that its inclusion in the DSM-IV-TR (APA, 2000) and ICD-10 (WHO, 1992) is the result of the psychological distress and functional impairment attributed to the underlying experience of gender incongruence rather than to transsexualism itself. Moreover, Gómez-Gil et al. (2008) also found that symptoms of psychological distress were lower among participants who were further along in the hormone therapy/sex reassignment process, which suggests that gender dysphoria may be the most accurate way to describe the "psychological disorder," and that transsexualism instead may be its "cure."

Prevalence

Prevalence estimates of transsexualism vary among sources. One reason for this variation is that some are based on counts of individuals who have undergone sex reassignment surgery, whereas other estimates are based on the number of individuals seeking any kind of help for GID (Olyslager & Conway, 2007). Both the American Psychological Association (2006) and the American Psychiatric Association (2000) estimate that 1 in 30,000 biological males and 1 in 100,000 biological females pursue

SRS, but these estimates are derived from epidemiological studies conducted in small European countries and may not generalize to the world population (APA, 2000).

The World Professional Association for Transgender Health's *Standards of Care for Gender Identity Disorders* (Meyer III et al., 2001) cites much higher transsexualism prevalence rates of 1 in 11,900 males and 1 in 30,400 females, but even these estimates are extrapolated from the number of individuals who sought treatment for GID from a single gender clinic in the Netherlands (Bakker, van Kesteren, Gooren, & Bezemer, 1993). A more recent study conducted in Belgium found a similar transsexualism prevalence rate of 1 in 12,900 males and 1 in 33,800 females; in this instance, however, the criteria for being considered transsexual was having had SRS (De Cuypere et al., 2007), thus suggesting an even higher prevalence rate when including those who had not undergone SRS. Along the same lines, American researcher Michael Bailey (2003) estimated a prevalence rate of less than 1 in 20,000 in the combined male and female population.

Lawrence (2008a) observed that the prevalence of transsexualism in both men and women appears to be increasing, but this may actually reflect an increase in the number of gender dysphoric persons seeking treatment, not necessarily an increase in the prevalence of the phenomenon itself. Regarding gender differences in prevalence, estimates consistently indicate that transsexualism is more common in men than in women, with a ratio of roughly three to one.

Cross-cultural Incidence

Although most prevalence estimates of transsexualism originate from Western cultures, the phenomenon has been documented in several countries around the world

including Thailand (Winter & Udomsak, 2002), Malaysia (Teh, 2001), Myanmar (Coleman, Colgan, & Gooren, 1992), Singapore (Tsoi, 1990), India (Mahalingam, 2003), China (Ruan & Bullough, 1988), and Iran (Barford, 2008). American Indian and Alaska Native cultures refer to transsexuals as two-spirit people, implying that both a male and a female spirit reside within (Balsam, Huang, Fieland, Simoni, & Walters, 2004).

In Thailand, there are an estimated 10,000 MtF transsexuals (Winter & Udomsak, 2002). Known as “kathoeys,” Thai transsexuals do experience prejudice and discrimination, but they have a relatively integrated place in Thai society, perhaps more so than in any other culture. One reason for this is that indigenous Thai culture acknowledges the existence of three sexes: male, female, and male-to-female (i.e., kathoeys). Similarly, in Myanmar, males exhibiting cross-gender behavior are accepted—and even respected—by mainstream society, largely because of strong animistic beliefs. Referred to as “acaalts,” these cross-gender men are seen to be directly related to the spirit gods and often serve as shamans and seers.

In Malaysia, as in Thailand, there are an estimated 10,000 male-to-female transsexuals, known locally as “mak nyahs” (Teh, 2001). However, unlike Thai kathoeys or the acaalt of Myanmar, Malay mak nyahs face significant discrimination due to the overarching Islamic prohibition against cross-gender expression and behavior. As a result of their Islamic beliefs, many mak nyahs forego SRS and earnestly attempt to stop cross-dressing altogether. However, the mak nyahs are a significant and recognized presence within Malay society. India also has a significant transsexual population, although prevalence estimates are elusive. Referred to as “hijira” or “aravanis,” many Indian

transsexuals lead a marginalized existence, but not always. For instance, a hijira in north India recently ran for and was elected to the state assembly (Mahalingam, 2003).

Perhaps the most surprising geo-political location of documented transsexualism is Iran, where the frequency of SRS is second only to Thailand (Barford, 2008). Because Islam strictly prohibits cross-gender expression and homosexual behavior, SRS is considered the only treatment for gender dysphoria. The Iranian government expresses complete dedication to this understanding of transsexualism by subsidizing SRS and name changes on birth certificates (Barford, 2008).

Etiology

Despite its well-documented presence across cultures and throughout history (Cole, Denny, Eyler, & Samon, 2000; Meyerowitz, 2002), the precise etiology of transsexualism remains a mystery (Carroll, 2000; Cohen-Kettenis & Gooren, 1999; Cole et al., 2000; McNaulty, Adams, & Dillon, 2001). Biologically-based investigations of the origin of transsexualism have focused on prenatal hormone exposure (Bradley & Zucker, 1997; Cohen-Kettenis & Gooren, 1999; Schneider, Pickel, & Stalla, 2005), structural differences in the brain (Kruijver et al. 2000; Zhou, Hofman, Gooren, & Swaab, 1995), and genetic factors (Bradley & Zucker, 1997; Coolidge, Thede, & Young, 2002). Environmental approaches have explored critical-period imprinting (Benjamin, 1966; Money, 1986), atypical psychosexual development (Meyer, 1982; Stoller, 1985), parental influences (Bradley & Zucker, 1997; Green, 1987), and cultural beliefs (Tucker & Keil, 2001). The present consensus among researchers is that the etiology of transsexualism likely involves an amalgam of biopsychosocial factors (Bradley & Zucker, 1997; Carroll, 2000; Coates, 1990; Cohen-Kettenis & Gooren, 1999; Cole et al., 2000). Furthermore, the

phenomenological diversity of the transsexual experience among transsexuals themselves suggests that there is probably substantial etiological diversity across individuals (Carroll 2000; Cole et al., 2000); that is, the exact etiological path may be unique to individual transsexuals, or to subgroups of transsexuals (see section entitled Blanchard's Typology of MtF Transsexualism).

Chief among biological theories of etiology is the prenatal sex hormone theory of transsexualism (Bradley & Zucker, 1997). In their review of the topic, Cohen-Kettenis and Gooren (1999) cited two hormonal mechanisms, one involving androgens and the other involving estrogens, that may be implicated in the development of transsexualism. First, animal studies have shown that either an excess or dearth of androgens during a critical phase of prenatal development can result in sexually anomalous brain development. Too much exposure to testosterone during a female's in utero development led to male sexual differentiation in the brain, whereas insufficient exposure to testosterone during a male's in utero development resulted in female brain differentiation. The result of these respective androgen effects appear to be that genetically XX organisms tend to exhibit male sexual behavior, whereas genetically XY organisms tend to exhibit female sexual behavior. However, the androgen effect may not necessarily generalize to human beings, at least to the degree that it results in transsexualism. For example, most women exposed to abnormally high levels of androgens while in utero (due to Congenital Adrenal Hyperplasia [CAH]) do not become transsexuals (Cohen-Kettenis & Gooren, 1999).

The second hormonal mechanism hypothesized to be involved in the development of transsexualism involves estrogen effects. When estrogen is injected into heterosexual

females, there is a rise in luteinizing hormone (LH). As this effect is not found in heterosexual men, the observed LH rise is thought to reliably indicate a female sex-differentiated brain. According to prenatal sex hormone theory, if MtF transsexuals have female brains as a result of low in utero androgens, they should also exhibit an LH rise when injected with estrogen. Results testing this hypothesis have been mixed, however, and thus the “positive estrogen feedback effect” (Bradley & Zucker, 1997) remains inconclusive (Cohen-Kettenis & Gooren, 1999).

Schneider, Pickel, and Stalla (2005) explored the prenatal androgen exposure hypothesis by comparing the second digit to fourth digit ratio among MtF transsexuals ($n = 63$), FtM transsexuals ($n = 43$), female controls ($n = 65$), and male controls ($n = 58$). The 2D to 4D ratio refers to the length of the index finger as compared to the length of the ring finger in a given individual. In general, men have shorter second digits than fourth digits, whereas women tend to have roughly equal length second and fourth digits. In addition to being considered a reliable sexually dimorphic trait, the 2D to 4D ratio has been linked to prenatal androgen exposure: lower 2D:4D is suggestive of higher prenatal androgen exposure (as in men) and higher 2D:4D is indicative of lower prenatal androgen exposure (as in women). The present study reasoned that if MtF transsexualism occurs (at least partially) as a result of low prenatal androgens, then MtFs should also exhibit significantly higher 2D:4D ratios—the opposite of what would be found in heterosexual men (with plenty of “normal” prenatal androgen exposure). Findings supported this hypothesis in that MtF 2D:4D ratios were higher than control males and similar to control females, lending some empirical evidence to prenatal hormonal influence as an etiological factor in MtF transsexualism.

Additional evidence supporting a biological basis of transsexualism comes from two studies that found differences in brain structures between transsexuals and non-transsexuals. Zhou, Hofman, Gooren, and Swaab (1995) examined the hypothalamus of six MtF transsexuals and found that the volume of the bed nucleus of the stria terminalis (BSTc), a brain area crucial to sexual behavior, were female-sized (smaller) rather than male-sized. The same research team later replicated the study, again finding the male BSTc to be roughly twice the size of the female BSTc, and the volume of the MtF transsexual BSTc to be in the female range (Kruijver et al., 2000). Both studies suggested that the smaller MtF transsexual BSTc likely resulted from abnormal prenatal sex hormone activity, specifically low prenatal androgen exposure, but also acknowledged that genetic factors could have influenced the structural anomaly. Collectively, these findings have come to be known as the “brain-sex theory of transsexualism” and are frequently cited as evidence that transsexualism is a biological trick of nature wherein a female-like brain ends up in a male body. However, in a critique of the brain-sex studies, Lawrence (2009) points to a fundamental flaw in the studies: the transsexuals whose brains were used in the investigations (n = 6) had all undergone hormone therapy, which had likely “feminized” the brain resulting in smaller BSTc volumes. Without controlling for hormone effects, it is impossible to conclude that MtF transsexualism is a result of an inherently female brain.

Finally, there has been some empirical evidence suggesting that genetics play a significant role in the etiology of transsexualism. Bradley and Zucker (1997) reviewed the literature on Gender Identity Disorder (GID) in children and adolescents and distilled four main findings on genetic links to GID: 1) there appears to be a strong heritable

component to homosexuality (and GID/transsexualism are often conceptualized as extreme forms of homosexuality), 2) gender-dysphoric boys tend to have more brothers than sisters (i.e., elevated number of same-sex older siblings), 3) gender-dysphoric boys tend to be the youngest sibling in larger families (i.e., birth order effects), and 4) genetically-driven temperamental/constitutional factors including high inhibition and stress reactivity, high arousal, and marked sensitivity are associated with the development of GID in boys. In line with these findings, Coolidge, Thede, and Young (2002) found that 2.3% of their sample of 314 child and adolescent twins met DSM-IV criteria for GID, which was a higher than expected prevalence rate. Among Coolidge et al.'s sample of GID children, genetics accounted for 62% of the GID variance, strongly suggesting that heritability may be a central determining etiological factor.

One of the original environmental perspectives on the etiology of transsexualism encompassed a biological component as well. Medical doctors and gender specialists Harry Benjamin (1966) and John Money (1986) each conceptualized the development of transsexualism as resulting from an imprinting process. Much like animals encode a deep and lasting impression of their mother during an early critical period of development, both Benjamin and Money believed that transsexuals mis-encode an impression of their mothers such that they grow up to confuse their biological sex with their mother's female identity. Though the imprinting process was thought to be environmentally contingent, it could only occur within a strict biologically determined window of time, usually before the age of three, hence rendering the theory part environmental, part biological.

Psychodynamic theorists Jon Meyer (1982) and Robert Stoller (1985) proposed more purely environmental theories of etiology by attributing transsexualism to atypical

pathways of psychosexual development. Meyer (1982) asserted that transsexualism occurred in children born to mothers who were essentially personality disordered (with significant “character pathology,” p. 409), who used their children as intrapsychic objects to mitigate their own unresolved conflicts relative to gender. Because of the mother’s pathological utilization of the child in this way, separation-individuation was a conflictual and defensive process preventing the child’s ego structure from rooting in a single gender identity. Meyer suggested that transsexualism could develop as a result of dealing with this complex and confusing developmental situation. Stoller (1985) asserted that transsexualism resulted from deep enmeshment (called “blissful symbiosis”) with a depressed and sexually confused mother such that the child formed an intrapsychic identification with the female. He also posited that a distant father-son relationship intensified the disturbance in what he called “core gender identity.”

Modern psychodynamic theorist Susan Coates (1990) proposed a multi-factorial etiological model of transsexualism including genetic, hormonal, and temperamental factors along with psychodynamic parental influences. In her research program on boyhood GID, Coates and her team investigated factors in the mother-son dyad that might influence the etiology of GID. Of the 80 mothers studied, all evidenced characteristics of trait psychopathology and half endorsed depression. Twice as many of the mothers of GID boys expressed fear and devaluation of men as compared to mothers of controls, half of the mothers of GID boys spontaneously reported trauma histories whereas control mothers did not, and all mothers of GID boys engaged in parenting practices that were interpreted to inhibit the boys’ development of autonomy. In a subset of the larger sample of mothers of boys with GID ($n = 16$), Marantz and Coates (1991)

found that 53% met diagnostic criteria for Borderline Personality Disorder, which suggests a relationship between maternal psychopathology (particularly narcissistic disturbance) and childhood GID. Furthering Stoller's proposition that disordered mother-son enmeshment lies at the heart of GID development, Coates' work suggests a markedly non-blissful symbiosis between mother and son as an etiological explanation for GID.

Also exploring parental influences on gender and sexual development, Green (1987) conducted a 15-year longitudinal study exploring sexual identity development in "feminine boys." Three parental behaviors (of both mother and father) were consistently found among parents of feminine boys: 1) desiring to have a girl during pregnancy, 2) seeing the newborn son as a beautiful infant, and 3) spending less family shared-time during the early years. Green also found that mothers of feminine boys tended to have a positive reaction to early cross-gender behavior and did not discourage feminine behavior in their sons, whereas fathers of feminine boys did not react negatively to their sons' early cross-gender behavior and did not encourage masculine behavior in their feminine boys. Green's findings supported the notion that GID is a social learning phenomenon: parental attitudes and behaviors appear to have an impact on a child's sexual identity development.

Finally, cultural beliefs may also impact the etiology of transsexualism. In a single case study of a boy from Thailand, Tucker and Keil (2001) uncovered a potentially powerful cultural link to the boy's cross-gender behavior. Specifically, the boy's parents were convinced that he was a reincarnation of his grandmother, a belief that was completely congruent with their religious-cultural worldview, but they never spoke to the boy about this and in fact discouraged his cross-gender behavior. Despite this, from a

very young age, the boy claimed to be his grandmother and exhibited feminine behaviors (i.e., sitting to urinate, dressing in women's clothing). The authors of the study speculated that the boy's behavior was a result of his parents' silent conviction of his rebirth and their ensuing unconscious behaviors toward him. The implication here is that even subtle parental factors can have an impact on the etiology of transsexualism.

Summary

In essence, transsexualism is characterized by three core phenomena: identification with the opposite sex, rejection of the natal sex, and the desire to live permanently as the opposite sex. Transsexuals often seek to change their physical characteristics to match their desired sex by use of hormones and/or sex-reassignment surgery. As it stands, transsexualism is considered a diagnosable psychopathology and research is split as to whether or not transsexualism is accompanied by higher rates of other forms of psychopathology than are found in the general population. Despite the lack of clarity on this issue, there is a movement within the psychiatric community to depathologize transsexualism. Though its exact etiology remains unknown, there is evidence that both biological and environmental factors play a role in the development of transsexualism.

The transsexual phenomenon has been documented in several countries across the world with estimated prevalence ranges from 1:30,000 to 1:11,900 males and 1:100,000 to 1:30,400 females. Estimates indicate that transsexualism occurs roughly three times as frequently in men as it does in women. Because of this gender ratio, the vast majority of research and theory to date has focused on male-to-female transsexuals (MtF). The present study will also focus on MtF transsexuals. Specifically, this study seeks to explore a theory of MtF transsexual typology which classifies MtF transsexuals into two

groups based on sexual orientation. The following sections of this literature review describe the development of this typology, the ensuing controversy, the unanswered questions, and, finally, the rationale for how the present study might shed light on the validity of the proposed typology and competing theories.

Blanchard's MtF Transsexual Typology

Introduction

Since the turn of the twentieth century, gender researchers have proposed a number of typologies in an effort to categorize the recognized diversity in transsexual presentations. However, these typologies were primarily based on clinical impressions and were influenced by prevailing theoretical orientations of the time. Ray Blanchard was the first researcher to establish and describe a comprehensive typology of MtF transsexualism based on empirical data (Blanchard, 1985; 1988; 1989b). Blanchard's typology, although considered controversial by some members of the transsexual community (see Dreger, 2008), currently is considered the gold standard among researchers and clinicians working with MtF transsexuals. In fact, the evidential underpinnings of the typology were so powerful that Blanchard's work necessitated revision to the DSM gender dysphoria diagnoses.

Briefly, Blanchard's typology divides MtF transsexuals into two primary groups based on erotic orientation: homosexual (androphilic) and autogynephilic. Homosexual transsexuals are exclusively erotically attracted to men and are very effeminate prior to SRS both physically and in terms of their interests. If one were to speak of homosexuality on a continuum, one might say they are very homosexual. In contrast, autogynephilic

transsexuals—including heterosexual, bisexual, and analloerotic (not attracted to others) transsexuals—are powerfully erotically attracted to *the thought or image of being a woman*. This form of transsexualism is akin to an extreme and unusual type of fetishism in which the object of fixation is not concrete but instead is the *idea* of being a woman. Blanchard coined the term *autogynephilia*, or “love of oneself as a woman,” to describe this autoerotic phenomenon which he found among all MtF nonhomosexual transsexuals. Furthermore, Blanchard empirically demonstrated autogynephilia to be the core characteristic distinguishing MtF homosexual transsexualism from MtF nonhomosexual transsexualism, which suggests that there are two fundamentally distinct disorders with possibly orthogonal etiologies.

Early History and Development

Blanchard developed his MtF transsexual typology across a series of three main studies (1985; 1988; 1989b), originally inspired by an earlier investigation conducted by his mentor, Kurt Freund (Freund, Steiner, & Chan, 1982). Freund et al., (1982) had used basic self-report questionnaire data to explore a hypothesis proposing two primary types of transsexuals. He found that his sample of transsexuals could be dichotomously classified into homosexual and heterosexual types based on their propensity (or lack thereof) for fetishistic cross-dressing. Specifically, heterosexual transsexuals strongly endorsed fetishistic cross-dressing whereas homosexual transsexuals did not. Freund et al. (1982) further speculated that the fetishistic behavior endorsed by heterosexual transsexuals might not be limited to dressing in women’s clothing, but might be triggered by any fetish object or activity (i.e., shaving legs) that induced the feeling of being a woman. He introduced the broader term *cross-gender fetishism* to describe this possible

phenomenon. The study was foundational to Blanchard's work for two reasons: 1) it established empirical support for a two-group typology of transsexualism and 2) it provided evidence that fetishistic cross-dressing was a reliable behavioral differentiator of the two types of transsexualism.

Blanchard's review of the existing literature on transsexual typology yielded four possible MtF transsexual subtypes: homosexual (attracted to men), heterosexual (attracted to women), bisexual (attracted to both women and men), and asexual (not attracted to women or men) (Blanchard, 1985). In concert with Freund et al.'s (1982) suggestion of only two types of transsexuals (homosexual and heterosexual), Blanchard suspected that the asexual and bisexual types identified in the clinical literature were probably subtypes of heterosexual transsexualism. He suspected that the three nonhomosexual types of transsexuals (heterosexual, bisexual and asexual) shared a single core trait: cross-gender fetishism, as defined by Freund. If this was accurate, bisexual and asexual transsexuals would likely endorse a history of cross-gender fetishism on par with that of heterosexual transsexuals, and significantly greater than that of homosexual transsexuals. Blanchard tested this hypothesis on 163 transsexual study participants who presented to The Clarke Institute of Psychiatry's Research Section of Behavioral Sexology. Using cluster analysis, Blanchard divided subjects into four groups, homosexual (n = 100), heterosexual (n = 16), bisexual (n = 35), and asexual (n = 12), and compared the groups on their endorsement of sexual arousal to cross-dressing. The hypothesis was confirmed, leading Blanchard to conclude that heterosexual, bisexual, and asexual transsexualism were likely variations on a singular phenomenon: cross-gender fetishism (operationalized in this study via endorsement of transvestic fetishism). This

explained the gap between a century of clinical reports identifying four types of transsexuals and the Freund et al. (1982) finding of only two essential types.

Blanchard's second study of MtF transsexual typology (1988) investigated two new variables across the four subtypes. He predicted that homosexual transsexuals would differ significantly from heterosexual, bisexual, and asexual transsexuals on age of first clinical presentation and degree of childhood femininity, and that the three groups of nonhomosexual transsexuals would show no significant between-group differences on these variables. Sixty-four transsexuals, again drawn from the Clarke Institute subject pool, responded to self-administered questionnaires. The sample was divided into four groups (homosexual, heterosexual, bisexual, and asexual) of 16 participants each, and each participant was deemed a clear-cut representative of their particular transsexual type. As predicted, the three nonhomosexual groups evidenced similar ages of first presentation and degrees of childhood femininity. As a combined group, they reported being significantly less feminine during childhood and older at onset of transsexual urges than did the homosexual group. These results provided further evidence for two distinct types of transsexuals and for Blanchard's hypothesis that bisexual and asexual transsexualism are subtypes of heterosexual transsexualism.

It was Blanchard's third investigation into the typology of MtF transsexualism (1989b), however, that cemented his notion of a fundamentally dichotomous typology and directly tested his new concept of "autogynephilia." Here, Blanchard directly hypothesized that all transsexual males who are not homosexual are instead autogynephilic, or sexually aroused by the idea of being a woman (a refinement of Freund's idea of cross-gender fetishism). To test this prediction, Blanchard developed a

15-item Core Autogynephilia Scale to assess “a subject’s propensity to be sexually aroused by the fantasy of being a woman” (p. 616) and administered the measure to 212 transsexual males drawn from the Clarke Institute database. As predicted, there was a significant difference between the two main groups: homosexual transsexuals (n = 117) did not endorse autogynephilia, whereas the heterosexual (n = 19), bisexual (n = 58), and asexual (n = 18) transsexuals did. The concept of autogynephilia had been validated: it appeared to be the underlying connective factor among all forms of MtF transsexual nonhomosexual gender dysphoria. This new understanding made it possible to more quickly distinguish the two types of MtF transsexuals.

In a paper nearly contemporary with the publication of his third study, Blanchard (1989a) formally proposed his typology of MtF transsexualism, including a thorough review of the development of the concept of autogynephilia. Many writers had developed etiological theories and typologies of transsexualism based on clinical observation and experience, but in this report Blanchard particularly emphasized the works of Magnus Hirschfeld (1918) and Kurt Freund (1982) as the direct precursors to the recognition of autogynephilia. Hirschfeld (1918) had proposed a five-type classification scheme of transsexuals, the main four of which were homosexual, heterosexual, bisexual, and analloerotic (no erotic attraction to other persons of either sex.) However, two subgroups comprised Hirschfeld’s analloerotic type: 1) asexuals, described as experiencing no sexual arousal to anyone or anything, and 2) automonosexuals, described as sexually aroused by the idea of themselves as the opposite sex. Hirschfeld’s documentation and description of automonosexuals revealed awareness of the same phenomenon Blanchard noted, which is why Blanchard selected Hirschfeld’s typology as the starting point for his

own typological research. Similarly, Kurt Freund's speculation of a broader "cross-gender fetishism" as the sine qua non of nonhomosexual transsexualism rather than simple erotic cross-dressing served as another major catalyst in Blanchard's thinking about the underlying erotic orientation of nonhomosexual transsexuals (Blanchard, 2005).

Blanchard's three early studies on MtF transsexual typology (1985; 1988; 1989b) accomplished several significant feats. First, these studies provided empirical evidence to support a reliable two-type classification scheme differentiating homosexual transsexualism from autogynephilic transsexualism. Second, by demonstrating bisexual and asexual transsexuals to be subtypes of a "parent" heterosexual transsexual type, Blanchard resolved the conflict among the myriad of clinical typologies and research evidence regarding the number of transsexual subtypes. Third, Blanchard's early work identified and empirically established autogynephilia as the core and underlying distinguishing factor in the two major forms of transsexualism. The discovery of autogynephilia was revolutionary in that it effectively shifted the focus from transsexual behavior to transsexual experience itself. It prompted the long overdue realization that it wasn't how the fetish object made you feel that mattered, but *whom* the fetish object made you *feel like* that was driving a whole class of transsexual behavior. Finally, Blanchard's elucidation of autogynephilia also led to the very valuable clarification of the historically confusing terminology used to describe transsexual phenomena.

Expansion and Refinement

By 1990, Blanchard had outlined an elegant classification scheme to describe the varieties of transsexualism based on empirical research (1985; 1988; 1989b). He had identified two distinct manifestations of gender dysphoria in men, both of which could

lead to transsexual expression but each driven by completely different erotic motivations. Blanchard understood homosexual gender dysphoria always to be accompanied by potent androphilia, or erotic attraction toward men. Homosexual transsexuals, therefore, were individuals who experienced extreme dissatisfaction with their biological sex, wanted to live permanently as women, and were exclusively sexually attracted to males. Prior to Blanchard's work, all other nonhomosexual gender dysphorics were thought to comprise a heterogeneous group comprised of heterosexual, bisexual, and asexual individuals. Blanchard, however, established that the fundamental underlying factor common to all nonhomosexual gender dysphorics was autogynephilia, or erotic orientation toward the idea of oneself as a woman. Like homosexual transsexuals, autogynephilic transsexuals were extremely dissatisfied with their natal sex and desired to live permanently as members of the opposite sex, but unlike their homosexual counterparts, autogynephilics were not a homogenous group in terms of sexual orientation; they could be sexually attracted to women, women and men, or neither to women or men, but the defining feature of their anomalous sexuality was a powerful erotic attraction to idea of themselves as women (Blanchard, 1989a).

Blanchard's early work established that homosexual and autogynephilic transsexuals could reliably be identified on the basis of underlying erotic orientation (1989a), and that the two types differed on other variables as well, specifically age of first clinical presentation and degree of childhood femininity (1988). Blanchard's early work also had implications regarding the accuracy of the DSM diagnostic criteria for Gender Identity Disorder and Transvestism (Blanchard & Clemmensen, 1988). Embedded within the then-current DSM-III-R criteria for GID and Transvestism was the implicit assumption

that gender dysphoria and fetishistic arousal were mutually exclusive phenomena. That is, GID criteria did not acknowledge the possibility of co-occurring fetishistic arousal and, conversely, Transvestism criteria did not account for the possibility of co-occurring gender dysphoria. As a result, patients presenting with both gender dysphoria and fetishistic arousal were routinely diagnosed with Gender Identity Disorder, Not Otherwise Specified, a vague and non-descriptive assignment. Blanchard and Clemmensen (1988) explored the co-occurrence of gender dysphoria and fetishistic cross dressing in a sample of 193 male heterosexual gender dysphorics and found that a significant number reported feeling sexually aroused by cross-dressing. As a result, the authors argued for a revision of both GID and Transvestism criteria that would allow for the possibility of both phenomena to co-occur, a change that eventually took place in the updated DSM-IV (APA, 2000).

Blanchard's subsequent work on MtF transsexual typology proceeded along three concurrent lines of inquiry specifically regarding autogynephilia. First, Blanchard explored and developed an etiological theory of autogynephilia, which proposed it to be the result of *erotic target location errors* (1991; Freund & Blanchard, 1993). Second, Blanchard further observed the phenomenology of autogynephilic expression to derive and explicate four subtypes: physiologic, behavioral, anatomic, and transvestic (1991; 1993a; 1993b; 1993c). And third, Blanchard developed and tested the hypothesis that autogynephilia is a misdirected heterosexual impulse that competes with normative heterosexuality (1992).

Blanchard's etiological theory of autogynephilia as an erotic target location error was an elaboration of Bancroft's earlier proposition that paraphilias might develop as a result

of certain anomalous nervous system characteristics that play a role in sexual learning (Blanchard, 1991). Blanchard extended this idea to surmise that autogynephilia could be a result of a developmental nervous system malfunction in which an otherwise normal heterosexual imprinting mechanism was misdirected, causing erotic imprinting on the wrong objects. Developmental variations in this process would explain the spectrum of autogynephilia. For instance, during a developmentally sensitive period, if the nervous system caused a male heterosexual erotic impulse toward a woman's genitals to be misdirected toward the woman's panties instead, a panty fetish might ensue. In a more extreme scenario, if that same impulse was misdirected toward one's own genitals, the result could be an erotic wish for one's own genitals to embody a vulva. Blanchard named this possible phenomenon "erotic target location error" because a defect in the nervous system triggers an erotic impulse to land on the wrong target during a sensitive developmental window causing imprinting to occur (Blanchard, 1991). Freund and Blanchard (1993) went on to suggest erotic target location error to be the mechanism of action underlying pedophilia as well as transsexualism.

In addition to developing an etiological theory of autogynephilia, Blanchard identified and described a typology of autogynephilia based on reviews of more than a century of clinical evidence, along with his own observations (1991). He identified four types of autogynephiles: physiologic, behavioral, anatomic, and transvestic. He noted that, as with other paraphilias, these types were likely to co-exist or overlap within an individual. Physiologic autogynephiles are erotically aroused (often masturbating to orgasm) by the idea of being able to perform (or the attempt to, through the use of props) female physiological functions such as menstruating, lactating, or giving birth. In a

slightly different vein, behavioral autogynephiles' sexual fantasies are characterized by performing stereotypical female activities such as cleaning house, knitting, or going to the hairdresser. One common behavioral autogynephilic fantasy (or activity) is sexual intercourse with a biological male. Blanchard has speculated on several occasions that this phenomenon explains bisexuality in autogynephilic transsexuals; they have sex with males to feel like females, not because they are erotically attracted to the male physique (1989a; 1990; 1991). Anatomic autogynephilia represents the most extreme end of the autogynephilic spectrum as, in this case, individuals are erotically aroused by the idea of embodying the female body itself. Anatomic autogynephiles fantasize about having a vagina and breasts, or typically female physical characteristics such as hairless legs and soft skin. Finally, transvestic autogynephilics are those individuals who become sexually aroused by cross-dressing. This concept has appeared in the clinical literature since at least the time of Magnus Hirschfeld, but it was often used loosely to describe a broad range of cross-gender fetishistic activity. One of Blanchard's terminological contributions was to re-assign the term transvestism to refer to one specific expression of autogynephilia: fetishistic cross-dressing. Blanchard described transvestism as the most ubiquitous form of autogynephilia, usually co-occurring with each of the three aforementioned types of autogynephilia (1991).

In a short series of studies (1993a; 1993b), Blanchard took a closer look at the types of autogynephilia and explored how they might vary in terms of their correlation to gender dysphoria. First, Blanchard (1993b) hypothesized that anatomic autogynephiles (men sexually aroused by the idea of having a woman's body) would experience more gender dysphoria than solely transvestic autogynephiles (men sexually aroused by the

idea of dressing in women's clothing). Through the Clarke Institute's database, Blanchard collected a sample of 238 autogynephilic males and grouped them based on their answer to the following question, "Which of the following pictures of yourself has been most strongly associated with sexual arousal?" Ninety-four subjects responded, "as a nude female," 67 subjects responded, "as a female dressed only in underwear," and 77 answered, "as a fully clothed female." Results indicated that the anatomic autogynephiles (represented by the Nude group) were significantly more gender dysphoric than the transvestic autogynephiles (the Underwear and Clothed groups).

In an extension of the Nude-Underwear-Clothed study, Blanchard (1993a) further hypothesized and confirmed that the vulva is the aspect of the nude self-image most strongly correlated with gender dysphoria. Contemporaneously, Blanchard also introduced the concept of partial autogynephilia (1993c), a subtype of anatomic autogynephilia in which individuals are sexually aroused by images of themselves embodying a combination of male and female sexual anatomy. Often referred to as she-males, the partial autogynephilic has a "quasihermaphroditic" (p. 73) presentation. Blanchard points out, however, that much like transsexuals, she-males can be either homosexual or autogynephilic, an important distinction to understand for clinical purposes.

Finally, a third direction in Blanchard's research investigated autogynephilia in relation to heterosexuality. In his etiological theory, Blanchard proposed autogynephilia to result from an anomalous heterosexual impulse in which the impulse gets misdirected, perhaps due to a malfunction in the nervous system, during a critical developmental phase (1991). In one of his first studies on autogynephilia (1989b), Blanchard established

that autogynephilia co-occurs with heterosexuality; in contrast to homosexual gender dysphorics, heterosexual gender dysphorics overwhelmingly endorsed autogynephilia. He further proposed that autogynephilia not only co-occurs with heterosexuality but that it actually competes with it (1992). Comparing level of heterosexual interest with level of autogynephilia in a sample of 427 autogynephilic males, Blanchard found that the highest levels of autogynephilia were found at intermediate levels of heterosexuality, thus suggesting that autogynephilia competes with normal heterosexuality. These findings support Blanchard's explanation for the heterogeneity of autogynephiles' sexual orientations. Early in his research into transsexual typology, Blanchard (1985) had suggested that although the three nonhomosexual transsexual subtypes may share the same root of cross-gender fetishism, their developmental pathways are likely distinct. For example, he proposed an asexual transsexual's "latent" heterosexuality has simply become eclipsed by his cross-gender fetishism (i.e., autogynephilia), rendering him seemingly uninterested in sex with other persons at all. Along a similar line of thinking, bisexual transsexuals are heterosexuals whose behavioral autogynephilia is so pronounced that it influences their sexual behavior. Bisexual transsexuals are not homosexually attracted to other men but instead use them as cross-gender fetish objects. By having intercourse with men, bisexual transsexuals *feel like* women being sexually penetrated by a man.

Summary

Blanchard's early research of MtF transsexuals found two distinct groups within the population. The first group was exclusively sexually attracted to men and wished to become women because they had always felt like women on the inside. Blanchard called

these individuals homosexual transsexuals, referring to their sexual orientation based on their natal sex. The second group was comprised of heterosexual, bisexual, and asexual men who all reported experiencing sexual arousal to the idea of being a woman. These men engaged in cross-dressing and cross-gender fantasy to fulfill their erotic urges. Blanchard called these individuals autogynephilic transsexuals, referring to their sexual orientation toward the idea of being a woman. He proposed that autogynephilic transsexualism occurred due to an erotic target location error in which autogynephiles mistakenly located their heterosexual erotic targets (i.e., women) within themselves.

Blanchard's work clearly identified, described, and classified transsexual phenomena in a way that no prior researcher or theorist had been able to do. Furthermore, his typology was based on several empirical studies of transsexual experience and behavior, not only on clinical observation. His findings impacted the DSM-IV GID diagnostic criteria such that the narrative description of the diagnosis speaks to the phenomenon of autogynephilia, and his two-group typology will likely be made even more explicit in the upcoming DSM-V (Meyer-Bhalburg, 2009). Blanchard's theory, however, has also caused controversy among researchers who study transsexualism as well as in the greater transgender community. Its impact is discussed next.

The Impact of Blanchard's Transsexualism Typology

Introduction

Blanchard's proposed typology of MtF transsexualism based on sexual orientation revolutionized the understanding and study of transsexualism within the field of psychology. The typology has since been supported both empirically (Smith, Goozen,

Kuiper, & Cohen-Kettenis, 2005) as well as phenomenologically (Bailey, 2003; Lawrence, 1999b, 1999c). It has been cited in the Gender Identity Disorder section of the DSM-IV-TR (2000), in human sexuality textbooks (Kelly, 2005; LeVay & Valente, 2006; Rowland & Incrocci, 2008), and in both popular and scientific reviews of transsexualism (Bailey 2003; Bailey & Tria, 2007; Cohen-Kettenis & Gooren, 1999; Lawrence 2004). Additionally, Blanchard's typology has demonstrated significant theoretical utility by serving as a springboard for ongoing transsexualism research (Chivers, Reiger, Latty & Bailey, 2004; Green, 2000; Green & Young, 2001; Lawrence 2003; Lawrence, Latty, Chivers, & Bailey, 2005; Veale, Clarke, & Lomax, 2008).

Blanchard's conceptualization of MtF transsexualism has also sparked heated debate—even rage—among some who disagree with the typology (Dreger, 2008). This debate exploded after the publication of Michael Bailey's *The Man Who Would Be Queen* (2003), part of which was devoted to explicating and popularizing Blanchard's typology. Although there is no empirical counter-evidence for Blanchard's typology to date, some transsexuals have argued that Blanchard's two-group typology is too narrow, not allowing for variations in transsexuals' individual lived experiences, and that the typology's basis in sexual orientation, specifically the conceptualization of autogynephilia as a paraphilia, feels both inaccurate and insulting. Despite the force of the backlash against Blanchard's typology (particularly as it was presented in Bailey's book), the debate itself has been ultimately constructive to the scientific enterprise by pushing the transsexualism inquiry into deeper and more nuanced territory (Bailey & Tria, 2007; Blanchard, 2008; Lawrence 2006, 2007a, 2008b).

Support

There is strong empirical support for Blanchard's typology of MtF transsexualism. Smith, Goozen, Kuiper, and Cohen-Kettenis (2005) investigated the validity of subdividing transsexuals on the basis of sexual orientation and found the dichotomous classification scheme to be both theoretically and clinically meaningful. In this study, 187 transsexuals were placed into one of two groups based on self-reported sexual orientation. As per Blanchard's typology, subjects who endorsed erotic attraction exclusively to members of the same biological sex were considered homosexual (n = 113) whereas subjects with asexual, heterosexual, or bisexual erotic orientations comprised the nonhomosexual group (n = 74). As predicted, homosexual transsexuals were found to engage in more early childhood cross-gender behavior, feature more physical characteristics naturally congruent with that of the opposite sex, and had applied for SRS an average of 8 years prior to their nonhomosexual counterparts. Moreover, nonhomosexual transsexuals experienced more sexual arousal to cross dressing during adolescence and reported more heterosexual marriages than homosexual transsexuals, thus replicating several of Blanchard's findings in differences between the two groups. Although Smith et al. (2005) did not find significant differences in height, weight, or BMI between homosexual and nonhomosexual groups as did Blanchard, Dickey, and Jones (1995), the overall findings of Smith et al. provided very strong empirical support for Blanchard's typology.

A body of phenomenological support for Blanchard's typology can be found in Anne Lawrence's collection of 59 narratives about autogynephilia (1998, 1999b, 1999c). Lawrence is a clinical psychologist (Ph.D.) and physician (M.D.) specializing in the

research and treatment of transsexualism. She is also a fully transitioned MtF transsexual who self-identifies as autogynephilic in erotic orientation and a strong advocate of Blanchard's typology. Lawrence's voice is particularly powerful to the discussion of autogynephilia because her views derive from rigorous research, ongoing clinical work, and her own lived experience as an MtF transsexual (see www.annelawrence.com for a comprehensive list of all publications).

The purpose of Lawrence's narrative project was informally to explore whether transsexuals from a non-clinical population could relate to Blanchard's typology of transsexualism, particularly the concept of autogynephilia. Lawrence wrote and posted online an article summarizing Blanchard's theory and solicited anonymous written reactions to the theory from MtF transsexuals. She collected over 100 narratives, 59 of which she deemed authentic and analyzed for content. Nearly all participants reported feelings and experiences consistent with autogynephilia. Furthermore, participants voiced several common themes in reaction to finding out about autogynephilia: 1) surprise and relief that others also experienced autogynephilia, 2) having questioned their autogynephilic arousal as a transsexual experience, 3) fear of sharing autogynephilic feelings with counselors and health providers, 4) needing autogynephilic stimuli for sexual arousal, and 5) experience of autogynephilia even after transition (1999b; 1999c). Although the study design traded experimental control (i.e., sample representativeness and data verification) for participants' expressive freedom (i.e., anonymity), the narratives clearly supported autogynephilia as an actual experienced phenomenon among some members of the greater non-clinical transsexual population.

Another phenomenological example of Blanchard's theory is found in Michael Bailey's book, *The Man Who Would Be Queen* [TMWWBQ; (2003)]. Bailey used a case-study approach to explore and explain the differences between homosexual and autogynephilic (or non-homosexual) transsexuals. He described "Terese," a homosexual MtF transsexual, as wanting to be a girl since early childhood. Terese cross-dressed in girls' clothes, played little-girl games, and had girls as his best friends. During adolescence, Terese was unequivocally erotically attracted to boys and experimented with gay sex, but found it unsatisfying. Terese was most satisfied when dressed in drag and attracting heterosexual males. After a difficult adolescence, Terese decided to pursue hormone therapy and SRS to achieve a body that was congruent with his inner feminine identity. Post surgery, Terese began to thrive: her appearance was that of an attractive female, her personality shifted from depressed to vivacious, and she engaged in several satisfying relationship experiences with heterosexual males. Bailey asserted that Terese's life story exemplified the main characteristics of homosexual transsexualism: early onset of gender dysphoria and feminine behavior, categorical homosexual erotic orientation, early transition from MtF resulting in an easily passable female appearance.

In contrast to Terese, Bailey described "Cher," an autogynephilic (non-homosexual) transsexual. Cher did not show any cross-gender behavior during childhood, but began cross-dressing during puberty, an activity accompanied by strong sexual arousal and always ending in masturbation. Cher went through periods of adolescence and adulthood fighting the urge to cross-dress out of shame, but always ended up succumbing to the erotic urge. Cher's first sexual encounter with another person occurred at age 33, but it was unsatisfying. After several sexual encounters with men, during which he fantasized

being a woman being penetrated, Cher finally underwent SRS at age 40. Overall, Cher appeared to be happier living as a woman, but struggled to find the right relationship and continued to achieve sexual satisfaction by masturbating to her now female reflection in the mirror. According to Bailey, key features of Cher's life experience parallel Blanchard's description of autogynephilic transsexualism. These include late onset of cross-dressing (relative to homosexual transsexualism), sexual arousal to the idea of being a woman (i.e., autogynephilia), late transition from MtF (again, relative to homosexual transsexuals), yet, in the end, appearing as a man trying to look like a woman, rather than looking like an actual woman. Although Bailey described only two cases in depth, this work provided clear illustrations of the two forms of transsexualism proposed by Blanchard's typology.

Blanchard's work on autogynephilia was recognized in the latest revision of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (APA, 2000) in the narrative description of Gender Identity Disorder (GID):

Adult males who are sexually attracted to females, to both males and females, or to neither sex usually report a history of erotic arousal associated with the thought or image of oneself as a woman (termed *autogynephilia*). In most cases, the individual would qualify, at least in his past, for a diagnosis of Transvestic Fetishism. In others, however, the individual's favorite fantasy emphasizes feminine attributes other than clothing. Some men, for example, masturbate while picturing themselves as nude women, focusing on their imagined breasts and vulvas; others masturbate while picturing themselves engaged in some stereotypically feminine activity such as knitting. (pp. 578-579)

Although the DSM-IV-TR does not enable diagnosticians to specify homosexual versus autogynephilic GID diagnoses, the inclusion of autogynephilia as a possible feature of GID represents an evolution in diagnostic sophistication as a result of Blanchard's work on transsexual typology.

Similarly, Blanchard's typology of transsexualism and theory of autogynephilia have appeared in several human sexuality textbooks (Kelly, 2005; LeVay & Valente, 2006; Rowland & Incrocci, 2008), which is further evidence of its respected status among peers and impact on the field. For example, Blanchard's classification scheme is presented as the primary working transsexual typology in the Gender Identity Disorders chapter of the *Handbook of Sexual and Gender Identity Disorders* (Rowland & Incrocci, 2008). The handbook describes respective characteristics of homosexual and nonhomosexual transsexual subtypes as well as discusses autogynephilia as the primary sexual orientation of the non-homosexual subtype.

Several prominent researchers (Bailey, 2003; Bailey & Triea, 2007; Cohen-Kettenis & Gooren, 1999; Lawrence, 2004) have propagated Blanchard's typology in their writings on transsexualism. In their review of the etiology, diagnosis and treatment of transsexualism, Cohen-Kettenis and Gooren (1999) discussed the validity and potential utility of Blanchard's transsexual classification scheme in transsexualism research. The authors cited a number of studies exploring psychopathology in transsexuals, but all yielding conflicting results. They asserted that this pattern of results was likely due to researchers' assuming transsexuals to be a homogeneous population and treating them as a single group. As an antidote to this, Cohen-Kettenis and Gooren strongly supported utilization of Blanchard's two-group typology. They suggested that psychopathology may

differ between homosexual and autogynephilic transsexuals and this heretofore unnoticed difference is what accounts for the historically ambiguous results in psychopathology studies with this population.

Additionally, Bailey (2003) devoted one-third of *TMWWBQ* to explaining Blanchard's typology and illuminating differences between homosexual and autogynephilic transsexuals using case examples. Lawrence (2004) reviewed the concept of autogynephilia and explored its potential contributions to the research and treatment of transsexualism. Bailey and Tria (2007) reviewed Blanchard's typology and explained how it challenges the predominant cultural narrative about transsexuals—that they are women trapped in men's bodies—by revealing that a subset of transsexuals are motivated by the desire to become women (i.e., autogynephilia) rather than by the belief that they are indeed women already.

Perhaps the most significant measures of acceptance of Blanchard's typology, however, are the subsequent empirical studies that have utilized it as their theoretical starting point. There are four such areas of investigation: 1) sexual arousal, 2) sexual orientation, 3) birth order and finger length effects, and 4) post operative issues. First, a study exploring sex differences in sexual arousal patterns also investigated the genital and subjective arousal patterns of homosexual and autogynephilic MtF transsexuals (Chivers, Rieger, Latty, & Bailey, 2004). Like natal men, both groups of transsexuals showed category-specific response patterns to sexual stimuli; that is, all transsexuals, regardless of sexual orientation, responded genitally and subjectively to pornography depicting the sex they were attracted to but not to stimuli depicting the sex they did not orient toward. This pattern contrasted to that found in natal females, who aroused equally to stimuli of

their preferred and non-preferred sexual partners. An extension of this study (Lawrence, Latty, Chivers, & Bailey, 2005) more closely examined differences in arousal patterns between the two groups of transsexuals and found that homosexual transsexuals produced significantly lower correlations between genital and subjective arousal in response to the visual erotic stimuli than the autogynephilic transsexuals. Given that natal females produced lower genital-subjective arousal correlations than men (Chivers et al., 2004), one possible interpretation for these findings is that homosexual transsexuals produce arousal patterns that are decidedly “more female” than their autogynephilic counterparts.

A second line of research utilizing Blanchard’s typology has explored sexual orientation in homosexual and autogynephilic transsexuals. Chivers and Bailey (2000) investigated sexual orientation in a sample of 39 Female-to-Male transsexuals and found that Blanchard’s typology may be a useful distinction among FtM transsexuals. For example, homosexual FtMs endorsed more early gender dysphoria, were more attracted to feminine women, were more sexually active, experienced more desire for SRS, and were more aroused by pornography than nonhomosexual FtMs, thus suggesting a bright line distinction between homosexual and possibly “autoandrophilic” FtM transsexuals.

In a recent study investigating the validity of Blanchard’s sexual orientation typology, Veale, Clark, and Lomax (2008) administered online questionnaires to a sample of 234 MtF transsexuals and 134 biological females to explore possible differences in aspects of sexuality within and between the two groups. Results supported Blanchard’s typology in that transsexuals classified as autogynephilic endorsed more aspects of sexuality associated with autogynephilia than their nonhomosexual counterparts. Both groups of transsexuals endorsed more autogynephilia than biological women. Two findings,

however, were inconsistent with Blanchard's typology: the autogynephilic transsexuals in this sample 1) scored higher on Attraction to Males than their homosexual counterparts and 2) did not report any instances of asexuality. Investigators concluded that although Blanchard's typology appears to apply to the majority of MtF transsexuals it may not account for some diversity in the population.

A third area of investigation making use of Blanchard's transsexual typology examined differences in biological markers among groups of transsexuals. Richard Green (2000) investigated birth order and ratio of brothers to sisters in transsexuals and found that homosexual MtF transsexuals, like homosexual males, "...have a later than expected birth order and more older brothers than other subgroups of male-to-female transsexuals" (p. 789). This finding supports the hypothesis that variations in fetal hormones may be responsible for differences in psychosexual development, as fetal hormonal exposure is thought to shift across a mother's multiple pregnancies. The differences in the fetal hormonal environment that occur in later pregnancies across a birth order may contribute to the development of transsexualism—particularly homosexual transsexualism. In a related investigation of hand preference in transsexuals, Green and Young (2001) found a greater frequency of nonright-handedness in transsexuals than in controls, but no significant differences in hand preference between homosexual and nonhomosexual transsexuals. The authors thus proposed that transsexualism may be linked to atypicality in central nervous system organization.

Finally, Lawrence has explored aspects of SRS outcomes as they relate to the sexual orientation of transsexuals. She found that transsexual typology did not correlate with post-operative SRS satisfaction but that instead final physical appearance was the most

important determinant of surgery satisfaction (2003). Another finding was that autogynephilic behavior and fantasy decreased after SRS (2005).

Resistance

Blanchard's studies on transsexual typology did not engender much resistance until the publication of Michael Bailey's book, *The Man Who Would Be Queen (TMWWBQ, 2003)*, a section of which advanced Blanchard's theory of autogynephilia. Bailey's approach to illuminating Blanchard's theory was at times raw and graphic, and found by many in the transsexual community to be narrow-minded and deeply offensive. The reaction to Bailey's exposition of autogynephilia in particular, was swift, severe, and ugly. Bailey and his family were publically humiliated and terrorized, and his critics leveled accusations against him that nearly cost him his academic position at Northwestern University. Ray Blanchard, too, was thoroughly criticized and demeaned, cast as a cold researcher/academician in the business of "entomologizing" transsexuals. Researcher and clinician Anne Lawrence was also implicated in the backlash to the Bailey book; as a self-proclaimed autogynephilic MtF transsexual, she was portrayed as a traitor to the transsexual community, deluded in her thinking and pandering to powerful patriarchal scientists. In essence, Bailey, Blanchard, and Lawrence were deemed by their harshest critics a trio worthy of professional and personal crucifixion (see Dreger 2008 for a full exposition of events surrounding the publication of *TMWWBQ*). An unfortunate side effect of the scandal was that empirical research and academic discourse on MtF transsexualism temporarily halted as many sex researchers felt it was too risky an area to pursue.

In 2008, Alice Dreger published a scholarly history of the Bailey book controversy in the *Archives of Sexual Behavior*. Dreger's work provided a painstakingly thorough review of the controversial events leading up to *TMWWBQ*'s publication and the backlash that followed, and attempted to clarify what Bailey actually said in his book versus what had been interpreted by his critics. Although Dreger has been criticized for her particular approach to documenting the Bailey book controversy (Barres, 2008; Bettcher, 2008; Caretto, 2008; Clarkson, 2008; Gagnon, 2008; Lane, 2008; Mathy, 2008; McClosky, 2008; Serano, 2008; Windsor, 2008), her work did serve to re-open an academic dialogue on MtF transsexualism and the concept of autogynephilia (Adler, 2008; Bancroft, 2008; Blanchard, 2008; Lane, 2008, Lawrence 2008; Meana, 2008; Moser, 2008; Nichols, 2008; Wyndzen, 2008).

The section of Bailey's book, *TMWWBQ*, devoted to transsexualism was based on Blanchard's empirically-based typology, which categorized MtF transsexuals into one of two categories: homosexual or autogynephilic. To review, homosexual transsexuals show early childhood feminine behavior, exclusive sexual attraction to males, early pursuit of SRS, low erotic arousal to cross-dressing, and more authenticity in female appearance. Autogynephilic transsexuals, on the other hand, do not show early childhood feminine behavior but instead begin cross-dressing during adolescence, experience erotic arousal to cross-dressing, are primarily heterosexual but with an additional autoerotic drive, tend to transition at later ages, and have more trouble passing as women. In a series of empirical studies, Blanchard (1985, 1988, 1989a) found sexual orientation to be the most reliable distinguishing characteristic between the two groups of transsexuals and therefore proposed a dichotomous typology based on this difference. Bailey's book

presented Blanchard's theory and used (sometimes graphic) case examples to illustrate each type of transsexual. As Dreger (2008) detailed in her history, critics took massive offense to Bailey's presentation and, by association, to Blanchard's theory.

As a result of Dreger's history, several prominent researchers, clinicians, and activists thoughtfully commented on the issues raised in and by Bailey's book (see *Archives of Sexual Behavior*, Vol 37, 2008 for 24 published comments to Dreger). One of these commentators, Riki Lane (2008), succinctly summarized the two chief issues raised in reaction to Bailey's book: 1) "the dichotomous division of transwomen into two *essential types*, homosexual and autogynephilic" and, 2) "Bailey's sensationalist, sexualized, and deeply pathologizing portrayal of trans people" (p. 454). That is, the main problems critics voiced were with Blanchard's theory itself and/or Bailey's manner of illustrating Blanchard's theory. Although the latter (Bailey's manner of presentation) is an important issue (the way scientific research is presented can be just as important as the findings themselves), the former (critiques and reactions to Blanchard's typology) is of direct relevance to the present project and thus will be reviewed here.

The present issue in question is the validity of Blanchard's typology of MtF transsexualism. Is a typology that dichotomously classifies MtF transsexuals as either homosexual or autogynephilic accurate? Certainly Blanchard has provided significant empirical support for the validity of the typology, but several researchers have presented different views. Based on 44 years of clinical work with transsexual clients, Bancroft (2008) views autogynephilia as a "transitional phase" that many transsexuals experience early on in their transitional process, rather than as the distinguishing characteristic of a distinct "type" of transsexual. This view is echoed by sociologists and transgender

researchers Dave Ekins and Richard King (2001; 2006) who conceptualize transsexualism as a fluid, ongoing process of “gender migration” rather than as a static condition. Although Ekins and King agree that autogynephilia exists, they regard it as a transitory phenomenon which occurs in some individuals at various times of migration (2006). Adding to this chorus is physician, psychotherapist, and sex researcher, Charles Moser (2008), who endorses autogynephilia as a transsexual phenomenon but not as a valid basis of categorization. Moser does not believe that autogynephilia is a sexual orientation, nor that it is the primary motivating factor driving SRS in a particular group of transsexuals.

Another group of critics argue that Blanchard’s two-group typology of transsexuals is simply too narrow. Margaret Nichols (2008), a psychotherapist who has worked with transgender clients for over 25 years, is one of these critics. Based on her clinical work, she conceptualizes MtF transsexuals along a “transgender continuum” and asserts that, “If one...simply listens to trans people, one hears not only the ‘feminine essence’ and the ‘autogynephilic’ narrative, but a dizzying array of histories...such an array of gender variances renders a simplistic taxonomy like Blanchard’s not so much wrong as irrelevant (p. 477).” Lane (2008) cites several prominent sex researchers asserting that there are likely more than just two types of transsexuals. Similarly, psychologist and MtF transsexual Madeline Wyndzen (2008) argues that autogynephilia and feminine essence are not the only two documented “types” of transsexual experience; she cites others’ and her own personal experience as alternative types of experiences (see www.genderpsychology.org for Wyndzen’s autobiography). She also asserts that although sexual orientation is probably an important factor to consider in understanding

the varieties of transsexualism, it is not the central factor underlying differences among subgroups as Blanchard proposes.

“Feminine essence narrative” is a phrase developed by Dreger (2008) to describe the popular belief that MtF transsexuals experience themselves as women trapped in men’s bodies. According to this view, the remedy for biology’s gender “mistake” is for these natal males to physically transform into the women they identify with inside. The feminine essence narrative speaks to an experience of transsexualism hinging on gender identity, not on erotic motivation. For decades, clinicians and the public at large have endorsed the feminine essence narrative (see Blanchard, 2008; Dreger, 2008). Conversely and controversially, Blanchard’s theory of autogynephilia, or erotic love of oneself as a woman, cites lust as the motivating factor in some transsexuals. Autogynephilia challenges the ubiquity of the feminine essence narrative by revealing a subset of MtF transsexuals who do not experience themselves as women trapped in men’s bodies, but instead as men so erotically attracted to women that they want to embody the women they love. Critics such as Nichols (2008), Lane (2008), and Wyndzen (2008) do not disagree that autogynephilia may motivate some transsexuals, and that the feminine essence narrative may motivate others, but they also assert that there are likely many other “types” of transsexuals than just these two.

Wyndzen (2008) also suggests that sexuality and gender identity may get conflated in studies of transsexualism, leading to less-than-accurate findings regarding “types” of transsexuals. Meana (2008) further proposes that “Sexual drive and identity do not have to be mutually exclusive (p. 470).” She argues that autogynephilia itself may impact feminine identity development. What begins as the erotic drive of autogynephilia might

mellow over time and give way to a sense of female identity—an identity built upon a collection of autogynephilically-driven experiences. If this is true, then Blanchard’s theory of autogynephilia is not at all at odds with the feminine essence narrative, they are simply two interacting processes.

Jonathan Adler (2008) would agree with Meana. In his paper analyzing the Bailey book controversy and the backlash against Blanchard’s theory, Adler illustrates two ways of understanding the world—paradigmatic and narrative. The paradigmatic view is achieved via the scientific method whereas the narrative view is one comprised of personal life stories leading to a sense of identity. Adler states, “...the goal of paradigmatic arguments is to generalize, to speak to trends in the population, while the goal of narratives is to explain how one’s life is unique (p. 424).” In keeping with this framework, Blanchard’s dichotomous typology represents a paradigmatic worldview, one that describes two distinct trends in the population. Critics who railed against Blanchard’s typology (and Bailey’s portrayal of it) were fighting for the narrative worldview, one that is based on personal lived experiences, or identity. Since the paradigmatic/scientific cannot be reduced to the narrative/identity or vice versa, the fundamental error in the Bailey controversy (and Dreger’s reporting of it) was to pit the paradigmatic against the narrative, as if they were the same modes of thought. Instead, Adler argues, the resolution lies in the co-existence of both the paradigmatic and the narrative and peace will come when both camps recognize the legitimate existence of the other as a different epistemologic perspective.

Similar to Adler, Douglas Schrock and Lori Reed (2006) speak to the importance of distinguishing essentialist and social constructionist approaches in studying

transsexualism. Schrock and Reed characterize Blanchard's approach as essentialist, concerned with using empirical methods to categorize transsexuals, and contrasted this with their own social constructionist approach of exploring how transsexuals use personal narratives to create identity. In their study of transsexuals' sexual stories, Schrock and Reed demonstrate that identity development is an ongoing and crucial process for transsexuals, one that is influenced by past and present personal experiences as well as by cultural discourses. With these findings in mind, it appears that both personal experiences of and cultural discourse about autogynephilia impact identity construction among transsexuals. This view supports the notion that both essentialist and constructionist perspectives co-exist and interact, but that these perspectives are not direct competitors for a single-winner-only truth prize. In his review of the Blanchard/Bailey theory, Walter Bockting (2005) argues for an integrated biopsychosocial approach to understanding transsexualism rather than an essentialist view only.

Another area of dispute regarding Blanchard's theory of autogynephilia revolves around what is known as the "brain-sex" theory of transsexualism. The "brain-sex" theory is based on a study conducted by Zhou, Hofman, Gooren, and Swaab (1995) in which the volume of the BSTc of the hypothalamus, a sexually dimorphic structure in the brain, was found to be "female-sized" in a sample of six post-mortem transsexuals. Because the sample was comprised both of homosexual and autogynephilic transsexuals, these findings suggest that MtF transsexuals, regardless of sexual orientation, may have female brain structures. Kruijver et al. (2000) conducted a follow up study to Zhou et al. (1995), this time investigating neuron number in the BSTc of the same six transsexuals, and again found female-like neuron numbers in the structure.

Together, these two studies comprise the sum of the evidence underlying the “brain-sex” theory of transsexualism—essentially that MtF transsexualism is a neurological intersex condition (Lawrence, 2009, p. 1) in which female brains are trapped in male bodies, a theory that dovetails perfectly with the feminine essence narrative. After careful review of these two studies, however, Lawrence (2007) found three methodological problems with the Zhou/Kruijver findings: 1) the sample was small and may have been unrepresentative of the population, 2) upon review of the participants’ demographic information, it appears that the sample was comprised of all nonhomosexual MtF transsexuals, not of both homosexual and nonhomosexual transsexuals as previously thought, 3) all six participants had been utilizing feminizing hormones, which likely shrunk the volume and neuron number the BSTc to “female-sized.” Thus, this biological “evidence” for the feminine essence/brain-sex theory as a singular etiological explanation for transsexualism is inconclusive at best (Bailey & Triea, 2007).

Evolution

The controversy in response to *TMWWBQ*, though painful, ultimately served to push the dialogue on MtF transsexualism into more nuanced territory. In his most recent paper on MtF transsexualism (Bailey & Triea, 2007), Bailey states that autogynephilia “...may be conceived of as inner-directed sexuality (p. 523),” a decidedly different way to describe the phenomenon than he presented in prior publications. Although Bailey maintains that Blanchard’s typology is empirically superior to other theories on MtF transsexualism (i.e., the feminine essence/brain-sex theory), and that autogynephilia is still best conceptualized as a paraphilia, he also asserts that individuals’ histories and narratives are vitally important to a thorough understanding of transsexualism.

Furthermore, Bailey explains how denial and rejection of autogynephilia can be harmful to all transsexuals by deterring research, ignoring the need for type-specific clinical interventions, and by imposing a fear-induced silence on those who may experience autogynephilia but are too afraid to speak out. Blanchard (2005) has also clarified his views regarding autogynephilia. As Meana (2008) points out, “Blanchard himself distinguishes between the empirically validated phenomenon of autogynephilia and, as yet untested, theoretical statements involving autogynephilia (p. 470).” It is inspiring that both Bailey and Blanchard continue to refine the autogynephilia dialogue in spite of all the hostility they have faced in the wake of the controversy.

Anne Lawrence also continues her work exploring MtF transsexualism and autogynephilia. Although ultimately she may have lost the most in the controversy (see Dreger p. 417), currently she leads the pack in terms of advancing radical and subtle new theories of autogynephilia. One example of this is her explication of similarities between apotemnophilia, arousal to the thought or idea of being an amputee, and autogynephilia, arousal to the thought or idea of being a woman. Just as there are degrees of autogynephilia ranging from cross-dressing to sex-reassignment surgery, there also are degrees of apotemnophilia ranging from pretending to be an amputee to undergoing radical surgery to become an amputee. Lawrence points out that both apotemnophilics and autogynephilics experience 1) extreme dissatisfaction with their bodies, 2) sexual arousal to the idea of becoming the body they desire, 3) sexual attraction to other persons who already have the desired body-type, and 4) other paraphilic interests. She further asserts that apotemnophilia and autogynephilia may share the same etiology: erotic target

location error, a neurodevelopmentally triggered mistake in identifying and cathecting to an erotic target (Lawrence, 2006).

A second theory recently proposed by Lawrence (2007) conceptualizes autogynephilia as an expression of romantic love, returning to Blanchard's original description, "*love of oneself as a woman.*" She asserts that autogynephilia is often too narrowly interpreted as an erotic or lust-driven phenomenon only, when in fact it is much more like a multidimensional love including affection, attachment, admiration, idealization, passion, and longing for union with that which is beloved. Lawrence argues that the controversy over autogynephilia is a result of a misconceptualization of the phenomenon, rather than disagreement with the existence of the phenomenon. In addition to creating goodwill, a more dimensional understanding of autogynephilia helps explain personal experiences and clinical observations of transsexualism that have been heretofore uncategorizable.

Summary

Despite the fact that Blanchard's typology of MtF transsexualism has received empirical and phenomenological support from other research programs, it continues to elicit heated debate among many gender researchers. That autogynephilia exists as a phenomenon in some MtF transsexuals appears to be clear and agreed upon, but whether the experience of autogynephilia is a reliable indicator of a particular type of transsexual, one that is categorically distinct from a second type (i.e., homosexual transsexual), is not yet clear.

CHAPTER 3

AIMS OF THE PRESENT STUDY

The aim of this study was to explore Blanchard's theory of transsexualism and its counterpoint, the Feminine Essence Narrative, from a new angle. It was a preliminary attempt to investigate the "femaleness" or "maleness" of MtF transsexuals by comparing them to natal, heterosexual men and women in terms of visual attention to erotic stimuli. What follows is an explanation of the study rationale in three parts: 1) a comparison of Blanchard's theory to the Feminine Essence Narrative, 2) a discussion of eye-tracking methodology as applied to the study of gender differences, and 3) possible study findings and their theoretical implications.

Discussion of Competing Theories

Clarifying a long history of attempts to classify MtF transsexuals, Blanchard proposed a dichotomous typology based on sexual orientation. Homosexual MtF transsexuals were grouped based on androphilia, or exclusive sexual attraction to men. Non-homosexual MtF transsexuals (bisexual, asexual, and heterosexual) were grouped based on their common experience of autogynephilia, or sexual arousal to the thought or image of themselves as women. When grouped according to these two sexual orientations, additional differential characteristics between the two groups emerged (e.g., gendered behavior in childhood, age of transition, ability to "pass," marital history, gendered occupational history.)

Blanchard discussed potential etiologies of MtF transsexualism in two ways. First, he proposed that during a critical period of neural development, a subset of primarily

heterosexual males become predisposed to mistakenly locate their “natural” erotic target (women) in themselves (instead of in natal women.) Autogynephilia, or love of oneself as a woman, then expresses during adolescent sexual development and eventually leads this subset of heterosexual males to become transsexuals. Blanchard referred to this hypothesized etiological explanation as “erotic target location error” (Freund & Blanchard, 1993; Lawrence, 2006.) Second, Blanchard theorized about potential brain differences in homosexual and non-homosexual MtF transsexuals, suggesting that the former group’s neuroanatomy may share similarities with natal women, whereas the latter’s may be structurally different in another way (2008). Although Blanchard has not explicitly discussed an etiological theory of homosexual MtF transsexualism, Bailey (2003), whose work supports Blanchard’s typology, discussed the etiology of homosexual MtF transsexualism as a variation in male homosexuality. Based on Richard Green’s longitudinal study on feminine boys (Green, 1987), Bailey argued that although many feminine boys develop into homosexual men, a smaller subset of these boys develop into homosexual transsexuals and it remains unclear exactly how or why this developmental difference occurs.

Thus, it appears that Blanchard is open to the consideration of homosexual MtF transsexuals as sharing characteristics with women whereas Bailey considers them to be extremely homosexual men. On the other hand, both appear to consider autogynephilia a misdirected variant of male heterosexuality resulting from erotic target location error. Within this framework, autogynephilic MtF transsexuals are more similar to heterosexual males than to heterosexual females in terms of erotic orientation, despite their gender identification as women. Much like the erotic drive in heterosexual males to pursue

female sexual partners, the erotic drive in autogynephilic MtF transsexuals to become women stems from a fundamentally heterosexual erotic attraction to the female form. In fact, the autogynephilic erotic drive may be a much stronger variant of “normal” heterosexual erotic drive, as it causes some males go to extreme measures to conquer their erotic targets (i.e., via sex reassignment surgery). Autogynephilia may thus be a radical form of male heterosexuality.

In contrast to Blanchard’s typology, the Feminine Essence Narrative maintains that all MtF transsexuals are essentially women trapped in men’s bodies regardless of any identified differences among subgroups. Ironically, the Feminine Essence Narrative posits that MtF transsexualism is driven by gender identity, not erotic orientation, and that MtF transsexuals are essentially female identities trapped in male bodies (Blanchard, 2008; Dreger, 2007). If this is true and the underlying drive in MtF transsexualism is the need to make one’s biologically male body congruent with one’s true female gender identity, it is reasonable to suppose that both homosexual and autogynephilic MtF transsexuals are more similar to heterosexual women than to heterosexual males. Although it has not been empirically tested to date, the Feminine Essence Narrative is the most commonly cited counter-point to Blanchard’s typology.

Another alternative view to Blanchard’s typology conceptualizes transsexualism as an ongoing process of “gender migration” and autogynephilia as a transitory experience for some transsexuals along the way (Ekins & King, 2001). From a developmental perspective, it is possible that the trajectory of MtF transsexualism might involve early stages of autogynephilic drive leading to a series of lived experiences which eventually begin to inform gender identity itself (Meana, 2008). From this perspective, it is possible

that neither homosexual MtF transsexuals nor autogynephiles resemble heterosexual male or heterosexual female sexuality at all. Perhaps what actually characterizes transsexual sexuality is the interplay between erotic drive and identity rather than solely one or the other.

Eye-tracking Methodology

Overview

Although used extensively to investigate reading (Raynor, 1998), scene perception (Henderson & Hollingworth, 1999) and in developmental research (Karatekin, 2007; Feng, 2011), the study of visual attention via eye-tracking is a relatively new way to approach sexuality research. In contrast to self-report data, eye-tracking captures empirical information on visual attention and interest but in a manner that is mostly out of reach of conscious control or manipulation. This is because eye-tracking measures variables of interest (i.e., what is being looked at, how many times it is being looked at, and how long it is being looked at), in hundredths of a second (roughly 250 Hz/cycles per second), thus subverting some higher order cognitive processing that could lead to social desirability effects. (These effects are of particular concern to transsexualism research as participants are often motivated to answer in specific ways to secure clinical approval for sex reassignment surgery.) Additionally, eye-tracking bypasses written and spoken language in favor of capturing how the eyes “take in” an image, rendering the method less subject to biases introduced by language. Its central limitation, particularly relative to sexuality research, is that eye-tracking does not inform us as to higher order processing and we are left to interpret the meaning of visual attention; although variables such as

number of fixations and fixation duration are understood to represent degree of visual interest (Henderson & Hollingworth 1999; Raynor, 1998), eye-tracking data alone does not explain why the visual interest is occurring.

As Applied to the Study of Gender Differences

Eye-tracking methodology has been empirically validated in the exploration of sex differences in the visual processing of erotic stimuli (Lykins, Meana, & Strauss, 2008). Lykins, Meana, and Kambe (2006) conducted the first study of this kind when they used eye-tracking to investigate viewing patterns of men and women in response to erotic stimuli. Specifically, these researchers presented each participant (20 heterosexual men and 20 heterosexual women) with five erotic and five non-erotic photos depicting a member of the sex opposite from that of the participant. While viewing each photo, the eye-tracker captured data on each participant's visual attention. Results indicated that both men and women visually preferred erotic to non-erotic photos (evidenced more fixations and longer gaze durations), and that both men and women visually attended more to the bodies in the erotic photos than to other scene regions (i.e., faces or context). This study established that eye-tracking can indeed capture differences in visual attention to erotic stimuli versus non-erotic stimuli.

Rupp and Wallen (2008) reviewed the extant literature on gender differences in response to visual sexual stimuli and concluded that men and women appear to respond differently to visual erotic stimuli. This finding is consistent with what has been found using eye-tracking to explore sex differences in visual attention to sexual stimuli (Lykins, Meana, & Strauss, 2008; Rupp & Wallen, 2007). Lykins, Meana, and Strauss (2008) used eye-tracking to explore whether or not men and women have different visual attention

patterns when exposed to the same erotic stimuli. Twenty heterosexual men and 20 heterosexual women were exposed to five erotic and five non-erotic photos while their eye movements were tracked. This time, the erotic photos depicted heterosexual couples engaged in sexual foreplay whereas the non-erotic photos showed heterosexual couples engaged in non-erotic activities. Because all participants viewed the same ten photos, comparisons across gender could be made regarding visual attention. Results indicated that men visually attended significantly more to the women than to the men in the photos, but that women looked an approximately equal amount of time at men and at women, regardless of erotic content.

Rupp and Wallen (2007) used eye-tracking to explore sex differences, as well as the possible influence of oral contraceptives on visual attention to erotic stimuli. Participants were 15 heterosexual men, 15 heterosexual women on contraceptives, and 15 heterosexual women not on contraceptives. Each participant's eye movements were tracked while viewing a series of 72 photos depicting heterosexual couples engaged in sex acts. Findings indicated that males preferentially looked at female faces, women taking oral contraceptives spent more time looking at female bodies, and normal cycling women looked more at the genitals of both sexes than at any other scene regions.

Although the Rupp and Wallen (2007) findings do not directly correspond to the Lykins, Meana, and Strauss (2008) findings, both studies provide strong evidence that eye-tracking is an effective methodology for exploring sex (and hormonal) differences in visual attention to erotic stimuli. Furthermore, both studies point toward categorical sex specificity in men (as evidenced in preferential visual attention to depicted women) and

more fluidity in women (as evidenced in visual attention patterns reflecting interest in both sexes).

Aims

The broad aim of the present study was thus to explore visual attention in MtF transsexuals, particularly as it compares to that of heterosexual men and heterosexual women. The two questions of interest are: 1) Do MtF transsexuals resemble men or women in terms of their focus on erotic targets? 2) Do these comparisons depend on whether the MtF transsexual can be classified as homosexual or autogynephilic?

In light of the strengths of eye-tracking methodology, including its ability 1) to subvert many methodological problems associated with self-report data, and 2) to reliably capture differences in visual attention patterns in response to sexual stimuli, the present study employed eye-tracking to explore the visual attention patterns of MtF transsexuals. Assuming that we would replicate the sex difference found in the Lykins, Meana, and Strauss (2008) study, we explored the following possibilities:

- 1) Homosexual (androphilic) MtF transsexuals will evidence visual attention patterns similar to those of heterosexual women (as the Feminine Essence Theory would predict).
- 2) Homosexual (androphilic) MtF transsexuals will evidence visual attention patterns similar to those of men (as Blanchard's typology would predict).
- 3) Homosexual (androphilic) MtF transsexuals will evidence visual attention patterns that differ from those of men or of women.

- 4) Autogynephilic transsexuals will evidence visual attention patterns similar to those of heterosexual women (as the Feminine Essence Theory would predict).
- 5) Autogynephilic transsexuals will evidence visual attention patterns similar to those of men (as Blanchard's typology would predict).
- 6) Autogynephilic transsexuals will evidence visual attention patterns that differ from those of men or of women.

Our ability to test all of these propositions depended on our ability to recruit a sufficient number of participants that could be reliably characterized as homosexual MtF transsexuals and as autogynephilic MtF transsexuals. As will be detailed in the methods section, we were unable to recruit a sufficient number of MtF transsexuals that could be both reliably and conservatively categorized as autogynephilic. We thus elected to test only the hypotheses relating to homosexual MtF transsexuals in addition to further exploring sex differences in visual attention.

CHAPTER 4

METHOD

Participants

Study participants belonged to one of three groups: heterosexual natal men, heterosexual natal women, and androphilic MtF transsexuals (i.e., sexually attracted to men). Natal men and women were recruited via advertisement on the university Experimetrix website and word-of-mouth referrals. MtF transsexual participants were recruited by verbal announcement at a local transgender support group, advertisement flyers, and word-of-mouth referrals. Interested individuals were scheduled for an appointment with the student investigator. Natal men and women attended appointments at Dr. Marta Meana's Health and Sexuality Lab at the University of Nevada, Las Vegas and MtF transsexuals attended appointments at a centrally-located community mental health clinic in Las Vegas (where the transgender support group was run), in a comparable lab set-up to that at the university. Participants recruited through Experimetrix received 1 research credit for participation and those recruited through other means were offered a payment of \$15 to defray travel costs.

All participants were required to be over 21 years-old and had normal or corrected-to-normal vision (i.e., normal vision with contacts or glasses). Sexual orientation was a core inclusion/exclusion criterion. Only heterosexual men and heterosexual women participants were invited to participate, however, MtF transsexual participants of any sexual orientation were invited to participate. The Kinsey Heterosexual-Homosexual Rating Scale (see Appendices A and B) was used to determine sexual orientation in all participants.

A total of 74 individuals participated in the study, yielding a final sample of 53 participants who met inclusion criteria, produced valid eye-tracking data, and could be reliably grouped based on self-reported sexual orientation. Of the 22 self-identified natal men who participated, one was excluded for endorsing a bisexual orientation and a second was excluded after shifting in his chair during the eye-tracking portion of the protocol, resulting in significantly skewed data. Similarly, 24 self-identified natal women participated but two were excluded for endorsing bisexuality, a third for moving during eye-tracking, and a fourth after reporting nystagmus (a condition in which the eyes make rapid, involuntary movements, often resulting in reduced visual acuity). Finally, 28 self-identified MtF transsexuals participated in the study. Three participants were excluded after self-identifying as transvestites, one after self-identifying as a man, two due to technical errors during eye-tracking, one after shifting significantly during eye-tracking, and one due to medical problems inhibiting the eyes from opening completely (thus preventing accurate capture of eye-tracking data). Of the 19 remaining MtF transsexual participants, seven were excluded as they could not be conservatively grouped according to sexual orientation. Due to the complexity of sexual orientation in MtF transsexuals, self-report data was used in conjunction with the Kinsey Scale to confirm sexual orientation. Seven of the remaining 19 MtF transsexual participants scored other than 0 or 1 on the Kinsey Scale (thus endorsing gradations of bisexuality or heterosexuality) and/or verbally reported being asexual, bisexual or ambivalent regarding preferred erotic targets/sexual partners. Although one solution (for which there would have been support in the extant literature) would have been to consider these seven participants a distinct group (resulting in a comparison among four groups: heterosexual men, heterosexual

women, homosexual MtF transsexuals and non-homosexual MtF transsexuals) a conservative decision was made to only include participants who clearly anchored on a singular sexual orientation. Thus the 13 MtF transsexual participants who self-identified as unambiguously and exclusively attracted to men comprised the final group for analysis.

Socio-demographic characteristics of the final sample ($n = 53$) are presented in Table 2. Analyses revealed significant group differences among the three participant groups on age ($F(2, 50) = 9.099, p < .001$), ethnic identity ($\chi^2 = 18.641 (10, n = 53), p = .05$), religious affiliation ($\chi^2 = 20.226 (10, n = 53), p = .03$), and level of education ($\chi^2 = 37.582 (14, n = 53), p = .001$), but not level of income ($F(2, 47) = .407, p = .69$). Natal men and natal women were of similar ages ranging from 25-49 and MtF transsexuals were significantly older with an age range from 32-57. There was also significantly more ethnic diversity in the transsexual group than the other two groups: 77% reported an ethnicity other than White as compared to 30% of natal men and 25% of natal women who did so. A significantly greater proportion of MtF transsexuals (92%) than of natal men (35%) or natal women (55%) reported a religious affiliation. Nearly all of the natal men and natal women reported having some college education (95% of each group) and only 39% of MtF transsexuals reported any college experience; this is not surprising considering our university-based recruitment strategy for the natal men and women. There were no differences in income among groups; however, this may not reflect real-world differences in socio-economic status among men, women, and MtF transsexuals as the present comparison was between two groups of students and one group of non-students.

Measures

Two types of instruments were utilized in the present study: 1) eye-tracking, to ascertain total fixation duration and number of fixations, two frequently used dependent measures of visual attention and interest, and 2) self-report measures, to gather information on participant sociodemographics, sexual orientation, gender identity, surgery history, hormone use, sexual lifestyle choices, and experience of autogynephilia. Each measure is described below.

Total Fixation Duration

Eye-tracking methodology (see apparatus and procedure sections for technical details) was utilized to measure total fixation duration. Total fixation duration is a measure of time understood to indicate interest, stemming from the logic that we look at what we are interested in longer than at what we are less (or not at all) interested in. We captured each participant's total fixation duration (in milliseconds) per scene region (four: male face, male body, female face, female body), per slide (a total of ten slides). These data were then averaged across slides per participant, yielding a mean total fixation duration per scene region for each participant. Total fixation duration is a reliable measure that has been used frequently in scene perception and eye-tracking research (Henderson & Hollingworth, 1999; Raynor, 1995).

Number of Fixations

Number of fixations is a raw count of gaze points, also measured by eye-tracking. This measure also speaks to visual interest, but number of fixation specifically demonstrates degree of attentional capture an aspect of stimuli draws, the logic here being the more times we look at an aspect or region, the greater the indication that it has

secured our attention. We captured number of fixations per scene region (four: male face, male body, female face, female body), per slide (ten). Number of fixations is a reliable measure that has been used frequently in scene perception and eye-tracking research (Henderson & Hollingsworth, 1999; Raynor, 1995).

Post-experimental Questionnaires

Post-experimental questionnaires (Appendices A and B) adapted from Lykins (2004) were administered to all participants to gather information on age, ethnicity, religious affiliation, level of education, and socioeconomic status. There were two versions of post experimental questionnaires; a briefer 12-item version (Appendix A) administered to natal men and natal women, and a longer 19-item version (Appendix B) including questions for MtF participants on gender identity, hormone use and surgery history.

Kinsey Heterosexual-Homosexual Rating Scale

The Kinsey Heterosexual-Homosexual Rating Scale (Kinsey, Pomeroy, & Martin, 1948) was included in both versions of the post experimental questionnaire to assess sexual orientation (see Appendices A and B). The seven-point scale represents a continuum of sexual orientation ranging from 0, indicating exclusive heterosexuality, to 6, indicating exclusive homosexuality. All points between 0 and 6 (i.e., 1-5) represent varying levels of co-occurring heterosexuality and homosexuality. The scale has been used to establish sexual orientation in prior research comparing men, women, and MtF transsexuals on arousal to sexual stimuli (Lawrence, Latty, Chivers, & Bailey, 2005). Per convention, scores of 0 and 1 are considered indicative of categorical heterosexuality and were thus considered acceptable for inclusion in the present study.

Core Autogynephilia Scale

The Core Autogynephilia Scale (CAS; Blanchard, 1989b; see Appendix C) was used to assess autogynephilia in MtF transsexuals. The eight-item scale taps the core feature of autogynephilic experience: sexual arousal to the notion of being (a physiologically congruent) woman. Each item can be answered as endorsing autogynephilic experience (one point) or denying the experience (zero points), yielding total scores ranging from zero (no autogynephilia) to eight (significant autogynephilia). Blanchard found an average score of five on the CAS among autogynephilic participants and cited an internal reliability coefficient of .95, as did Veale, Clarke, and Lomax (2008) in a subsequent study. CAS internal consistency in the present sample was .93 although an insufficient number of participants endorsed autogynephilic experience to constitute one of the study groups.

Autogynephilia Semi-structured Interview

This verbal interview was based on questions from Michael Bailey's informal Test of Autogynephilia (Bailey, 2003; see Appendix D) and was administered to MtF transsexual participants. Bailey's interview was designed to aid the novice researcher in the differential identification of autogynephilic and homosexual transsexuals (Lawrence, 1999a). The measure has not been tested empirically, although a scoring system was developed in which 24 yes/no items are assigned numerical weight, ranging from +10 to -9. Scores are tallied continuously throughout the interview until criteria for either autogynephilic (+10) or homosexual (-10) transsexualism is met. The modified 20-item interview utilized here was used to straightforwardly assess for autogynephilia, marital

history, age of onset, gender identity and sexual orientation; the proposed scoring system was not utilized.

Stimuli

Ten split-screen slides, each featuring one nude erotic photo of a man shown on half of the screen and one nude erotic photo of a woman shown on the other half of the screen, comprised the visual stimuli. The 20 images were obtained from the Playboy and Falcon Studios websites and were selected such that photos of men and women were matched per slide for level of genital exposure, body position of models, and overall image size. Images were subsequently arranged onto 10 slides in a counterbalanced fashion (i.e., Slide A: nude man on left, nude woman on right; Slide B: nude man on top, nude woman on bottom; Slide C: nude man on right, nude woman on left; Slide D: nude man on bottom, nude woman on top). The ten slides were then ordered in five randomized slideshow sets.

Within a slideshow, each of the 10 slides was presented for 15 seconds apiece, interspersed with a standardized calibration slide that consists of a small white square in the center of a black screen. The calibration slide appeared nine times, once in between each of the 10 erotic slides, for five seconds each time. Total viewing time for a complete slideshow was 195 seconds (3.25 minutes), and total viewing time of erotic images was 150 seconds (2.5 minutes).

Apparatus

The stimulus slides were displayed to participants on a True Color monitor using a Radon VE ATI Graphics card operating at a refresh rate of 85 Hz. The resolution of each image was 1024 X 786 pixels X 256 colors. Eye movements were captured and recorded using an ASL Eye Track 6000 series Eye Start system, which consists of lightweight head-mounted optical sensors attached to an adjustable chinrest that is both comfortable and stable. The Eye Start system uses infra-red (940nm) video-based technology to sample eye positions at 250 Hz (Hz = cycles per second) using the corneal reflection method, which tracks two points of reference on the eye at each sample (the center of the pupil and the corneal reflection) rather than tracking the pupil alone. Although viewing is binocular, only the position of the left eye is tracked. The accompanying ASL GazeTracker software automatically orchestrates stimulus presentation and eye tracking throughout the protocol, and then also facilitates post-protocol analysis and visualization of data.

Procedure

Each participation session began with a brief description of study procedures and an opportunity for participants to ask questions. Participants read and signed the informed consent and were provided with a copy for their records. All participants were told they could freely elect to terminate the protocol at any time for any reason, without explanation, penalty or loss of compensation. MtF transsexual participants were additionally informed that their participation would in no way impact services they receive from the community counseling center and that all personal information collected

during the study would not be shared with any center staff. All participants were informed that both eye-tracking and questionnaire/interview data would be numerically coded, not directly linked to any identifying information and stored in a locked facility.

Next, participants were oriented to the eye-tracking headgear, which was securely mounted on one end of a six-foot long by two-and-a-half-foot wide table. The headgear consisted of an adjustable frame structure with a padded bar at forehead level, an adjustable chinrest, and two adjustable soft rubber rings. Participants were invited to sit at the headgear end of the table, and to place their chin on the chinrest and forehead against the upper bar. The frame and chinrest were then adjusted according to each participant's height and comfort. Most participants elected to lean slightly forward and place their arms on the table in front of them, to create additional stability. Finally, the rubber rings were rolled inward at the temples to gently secure a participant's head in place. Participants were asked to remain as still as possible for the duration of the eye-tracking.

Comfortably situated in the headgear, participants were instructed to look at the computer screen directly in front of them, at the opposite end of the table. A tic-tac-toe-like nine-dot matrix (white dots on a grey background) was displayed and participants were asked to look from one dot to the next for the purposes of calibrating the eye-tracking software to accurately capture each participant's unique point-of-gaze coordinates. This process was repeated at least once, but sometimes more than once to ensure calibration was to an average error in gaze position of 0.5° .

Once calibrated, participants were informed that they would be shown a slideshow on the computer monitor in front of them. They were instructed to look at each picture naturally and, when a calibration slide appeared, to gaze at the white square in the center

of the slide until a new slide of images appeared for natural viewing. Participants were informed that the slideshow would last only a few minutes and to remain as still as possible until the end of the slideshow. Photo-booth-like curtains were pulled around the participant set-up, providing viewing privacy.

After the eye-tracking protocol, participants completed the appropriate paper-and-pencil post-experimental questionnaire. MtF transsexuals also completed a brief short verbally administered interview. Upon protocol completion, all participants were debriefed as to the purpose of the study, provided with written debriefing information and offered an opportunity to ask questions. Participants were invited to contact the experimenter at any time with further questions, and were thanked and compensated for participation.

Data Analyses

Descriptive analyses were computed for participant background variables. Three-way mixed design ANOVA's were conducted for the two dependent measures, total fixation duration and number of fixations. The three factors were participant group (heterosexual men, heterosexual women, androphilic MtF transsexuals), target (erotic, non-erotic) and scene region (face, body).

CHAPTER 5

RESULTS

Overview

Data were collected and analyzed for two dependent measures: 1) total fixation duration and 2) number of fixations. Data indicate that total fixation duration and number of fixations are significantly positively correlated across all scene regions (all p 's < .001). First, descriptive and questionnaire data on the MtF sample are presented, followed by covariation results and decisions. Finally, in the main results section, the results of analyses of variance for each dependent measure are presented.

Descriptive Data on MtF Transsexuals

Each of the 13 MtF transsexual participants reported that they were born biological men but now identified and lived full-time as women. There was variation among participants regarding use of hormones, sex reassignment surgery, and cosmetic procedures (Table 3). Seven participants were taking hormones at the time of the study, two had undergone complete sex reassignment surgery (breasts and genitals), five had undergone top surgery (breasts only), and five had undergone various feminizing cosmetic procedures. Three participants had not engaged in any form of medical (hormones or surgery) or cosmetic feminization procedures.

All 13 MtF transsexual participants endorsed exclusive or nearly exclusive sexual attraction for men via the Kinsey scale (scores of 0 or 1), and verbalized a sexual preference for men during the interview. Three of the 13 transsexual participants (23%) endorsed high levels of autogynephilia whereas 10 (77%) endorsed low or no

autogynephilia as assessed from the administration of the Core Autogynephilia Scale (Appendix C). All transsexual participants were asked the following two questions: 1) Were you over the age of 40 when you began living full time as a woman? 2) Were you under the age of 25 when you began living full time as a woman? Six participants (46%) indicated that they were under age 25, four (31%) indicated that they were between the ages of 25 and 40, and three (23%) reported that they were over 40 years old when they began living full time as a woman. Seven participants (54%) stated that they had never been married (to a natal woman), five (38%) reported that they either had been or were currently married (to a natal woman), and one participant (8%) reported having children out of wedlock (Table 4).

Covariation Issues for the Entire Sample

Although we did find group (men, women, and transsexuals) differences in age, ethnicity, education, and religion (see Method section), there are no theoretical reasons to believe that these sociodemographic variables would be related to the dependent measures (total fixation duration, total number of fixations) in this study. Analyses were nonetheless conducted using age as a covariate but there was no appreciable difference in the results of interest. It was impossible to determine reliably the role of ethnicity, education, and religion given the categorical nature of these variables, the widely uneven number of individuals in each category, and our relatively small sample. Thus, for both theoretical and empirical reasons, the analyses presented here did not control for sociodemographic variable covariation.

There are, however, theoretical reasons to suspect that the use of feminizing hormones among MtF transsexual participants might affect the dependent measures in this study. To explore this, analyses were run comparing MtF transsexual participants currently using hormones ($n = 7$) to those not currently using hormones ($n = 6$) on total fixation duration and number of fixations. However, results of two 2 (Group: hormones, no hormones) x 2 (Target: erotic, non-erotic) x 2 (Region: face, body) mixed model repeated measures ANOVA's indicated that there was no main effect for Group and no significant Group by Target or Group by Region interactions on either dependent measure.

Main Analyses

Utilizing the SPSS 19 program, results were analyzed in two 3 (Group: heterosexual men, heterosexual women, homosexual MtF transsexuals) x 2 (Target: erotic, non-erotic) x 2 (Region: face, body) mixed model repeated measures ANOVAs, one for each dependent variable (total fixation duration and number of fixations). The three-level between-subjects factor was Group, whereas Target and Region were the two two-level within-subjects factors, respectively. It is important to keep in mind that the erotic target for our sample of heterosexual men was the women in the image, for heterosexual women, it was the man in the image, and for the androphilic MtF transsexuals it was also the man in the image. Results will be presented first for total fixation duration followed by number of fixations.

Total Fixation Duration

Table 5 displays means and standard deviations (SDs) of total fixation durations (in milliseconds, rounded to two decimal places) for men, women and MtF transsexuals by target (erotic and non-erotic) and region (face and bodies). ANOVA results for total fixation duration appear in Table 6. Significant main effects were found for Target and Region. There were two significant two-way interactions and one significant three-way interaction, which were analyzed using simple main effects.

There were significant main effects for Target ($F(1, 50) = 169.00, p < .001$) and Region ($F(1, 50) = 199.13, p < .001$), such that erotic targets were looked at longer than non-erotic targets and bodies were looked at longer than faces across groups. There was no significant main effect for Group ($F(2, 50) = .73, p = .485$).

There was a significant two-way interaction between Group and Target: $F(2, 50) = 22.62, p < .001$, partial eta-squared = .475. Men, women, and MtF transsexuals all looked at erotic targets longer than at non-erotic targets ($p < .001, p = .014$ and $p < .001$, respectively), however, there were significant differences among groups in the extent to which they did so (see Figure 1). Simple effects analyses were thus conducted.

With regard to erotic targets, men and MtF transsexuals differed marginally from each other in how long they looked at them ($p = .050$), but both groups looked longer at erotic targets than did women ($p < .001, p = .015$, respectively). With regard to non-erotic targets, women looked longer at them than did men ($p < .001$) or MtF transsexuals ($p < .001$), whereas men and MtF transsexuals did not differ in non-erotic target looking times ($p = .084$).

There was also a significant two-way interaction between Target and Region, $F(1, 50) = 66.59, p < .001$, partial eta-squared = .571 (see Figure 2). Simple effects analyses were conducted. Bodies were looked at longer than were faces in erotic targets ($p < .001$) and in non-erotic targets ($p < .001$). Additionally, both faces ($p < .001$) and bodies ($p < .001$) were looked at longer in erotic targets than in non-erotic targets.

There was a significant three-way interaction among Group, Target and Region: $F(2, 50) = 14.15, p < .001$, partial eta-squared = .361. Simple effects analyses were conducted. Men looked longer than did women at faces of erotic targets ($p = .026$; see Figure 3), whereas women looked longer than did men at faces of non-erotic targets ($p < .001$; see Figure 4; see Figure 5 for an additional representation). Both men and MtF transsexuals looked longer than did women at bodies of erotic targets ($p < .001$ and $p = .01$, respectively; see Figure 3), whereas women looked longer at bodies of non-erotic targets than did men ($p < .001$) or MtF transsexuals ($p < .001$) (see Figure 6 for an additional representation).

Number of Fixations

Table 7 displays means and SDs of number of fixations for men, women, and MtF transsexuals by target (erotic and non-erotic) and region (faces, bodies). ANOVA results for number of fixations appear in Table 8. Similar to results for total fixation duration, significant main effects were found for Target ($F(1, 50) = 169.08, p < .001$) and Region ($F(1, 50) = 513.25, p < .001$) on number of fixations, such that erotic targets were fixated on more frequently than were non-erotic targets and bodies were fixated on more frequently than were faces. Again, there were two significant two-way interactions and one significant three-way interaction.

There was a significant Group by Target interaction: $F(2, 50) = 19.65, p < .001$, partial eta-squared = .440 (see Figure 7). Men, women, and MtF transsexuals all fixated on erotic targets more often than on non-erotic targets ($p < .001, p = .002$ and $p < .001$, respectively), however, there were group differences in the extent to which they did so. Simple effects analyses were thus conducted.

With regard to erotic targets, men and MtF transsexuals did not differ from each other in how often they fixated on them ($p = .154$), but both groups fixated on erotic targets more frequently than did women ($p < .001, p = .027$, respectively). With regard to non-erotic targets, women fixated on them more often than did men ($p < .001$) or MtF transsexuals ($p < .001$), whereas men and MtF transsexuals did not differ in non-erotic target fixation frequency ($p = .073$).

There was also a significant two-way interaction between Target and Region, $F(1, 50) = 120.15, p < .001$, partial eta-squared = .706 (see Figure 8). Simple effect analyses indicated bodies were fixated on more often than were faces in both erotic targets ($p < .001$) and non-erotic targets ($p < .001$). Additionally, both faces ($p < .001$) and bodies ($p < .001$) were fixated on more often in erotic targets than in non-erotic targets.

A significant three-way interaction was found among Group, Target, and Region: $F(2, 50) = 16.81, p < .001$, partial eta-squared = .402. Simple effects analyses were conducted. Women fixated more often than did men and MtF transsexuals on faces of non-erotic targets ($p < .001, p = .002$, respectively) (see Figures 10 and 11). Both men and MtF transsexuals fixated more frequently than did women on bodies of erotic targets ($p < .001$ and $p = .022$, respectively) (see Figures 9 and 12), whereas women fixated

more often on bodies of non-erotic targets than did men ($p < .001$) or MtF transsexuals ($p < .001$) (see Figures 10 and 12).

CHAPTER 6

DISCUSSION

The aim of this study was to compare visual attention patterns among heterosexual natal men, heterosexual natal women and MtF transsexuals in response to explicit erotic photographic stimuli of nude men and nude women. Although the original intention was to recruit primarily autogynephilic MtF transsexuals for comparison with natal men and women, recruitment efforts resulted in one group of clearly identifiable homosexual/androphilic MtF transsexuals and a mixed group of MtF transsexuals that defied identification by sexual orientation. Analyses were thus limited to comparisons among heterosexual natal men, heterosexual natal women, and androphilic MtF transsexuals.

All three groups showed preferential visual attention, both in gaze frequency and duration, for their erotic targets as compared to their non-erotic targets; heterosexual men attended more to nude women, whereas heterosexual women and androphilic MtF transsexuals attended more to nude men. All three groups attended significantly more to bodies than to faces. Moreover, all three groups looked longer and more frequently at the bodies of their erotic targets (i.e., men looked at the bodies of nude women most, whereas women and MtF transsexuals looked at the bodies of nude males most) as compared to any other scene region.

However, there were also substantial viewing pattern differences among the three groups. Although men, women, and androphilic transsexuals looked at their erotic targets more frequently and for substantially longer than at their non-erotic targets, women looked at their non-erotic targets significantly more often and for longer durations than

did men or androphilic MtF transsexuals. In other words, men and MtF transsexuals showed a clear preference for looking at their erotic targets and much less interest in their non-erotic targets, whereas women showed considerable interest in their non-erotic targets. Moreover, both men and androphilic MtF transsexuals showed specific visual preference for the bodies of erotic targets as compared to any other scene region (i.e., faces or non-erotic target bodies). Although women also visually preferred the bodies of their erotic targets, that preference was not nearly as pronounced as it was in men or in androphilic MtF transsexuals. Women also attended to non-erotic target bodies significantly more than either men or MtF transsexuals. These results produced two broad findings relative to the study hypotheses: 1) natal heterosexual men and natal heterosexual women produced significantly different visual attention patterns in response to erotic stimuli, 2) androphilic MtF transsexuals produced visual attention patterns to erotic stimuli very similar to that of natal heterosexual men, and significantly different from that of natal heterosexual women. A discussion of each of these findings and associated potential explanations follows.

Visual Attention Differences Between Men and Women

Differential viewing patterns between men and women have emerged across a number of studies examining visual attention to sexual stimuli, although direct comparisons of results are often complicated by methodological differences (e.g., dependent measures, type of stimuli, presentation of stimuli, look zone delineation). In their foundational study on visual attention to sexual stimuli, Lykins, Meana, and Strauss (2008) tracked gaze patterns in response to erotic photos of heterosexual couples engaged

in various forms of sexual foreplay. They discovered that heterosexual men ($n = 20$) looked significantly more at opposite sex figures than at same sex figures but that there was no difference in heterosexual women's ($n = 20$) visual attention to opposite and same sex figures, yielding results similar to those of the current study. The difference between the Lykins et al. (2008) results and ours is a question of degree. Both studies showed a more diffuse visual attention pattern in women than in men, with women looking significantly longer than men at non-erotic targets. In our study, however, women did look significantly longer at their erotic targets than at their non-erotic targets. The difference in results between the two studies may relate to the nature of the visual stimuli used. Sexually explicit (i.e., genital exposing) side-by-side photos of nude men and women were utilized in the current study, whereas partially-clothed heterosexual couples engaged in foreplay comprised the sexual stimuli in Lykins et al. (2008). It has been suggested that women's visual attention becomes increasingly focused on erotic targets (as opposed to non-erotic targets) as a function of the explicitness of sexual stimuli (Tsujiura et al., 2009). This could account for the slightly stronger erotic target-focused visual attention pattern evidenced by women in the current study, as compared to Lykins et al. (2008). Another possibility is that viewing intertwined couples facilitates a more even distribution of fixations across targets as the male and female scene regions are directly adjacent to one another. In contrast, viewing two separate side-by-side images of individuals creates more of a forced-choice paradigm in which the viewer is "pressured" to visually favor one image because the images are further apart. Both sets of findings, however, show a strong tendency in men to look at their erotic targets, whereas women tend to divide their visual attention more equally between erotic and non-erotic targets.

Rupp and Wallen (2007) also found differences in visual attention to sexual stimuli when comparing men (n = 15), normal cycling women (n = 15), and women using oral contraceptives (n = 15). Their aim was to ascertain how gender differences and hormonal variations might impact viewing patterns in response to sexual stimuli. Visual stimuli were explicit sexual photos depicting heterosexual couples engaged in oral sex or intercourse and there were six delineated lookzones (instead of four in the current study): female face, female body, male face, male body, genitals, and context. Because the photos featured coupled sexual interaction, the genital lookzone included both male and female genitals together. The context lookzone was comprised of background scene, clothing, and any other non-human aspects of the images.

All participants in the Rupp and Wallen (2007) study generally preferred looking at genital and female lookzones, but the three groups differed from one another in their viewing preferences for other lookzones. For instance, men were significantly biased toward the female face lookzone and away from male face and body lookzones, similar to the results of our study which found men to prefer looking at women and appear disinterested in looking at men. Rupp and Wallen (2007) also found that both groups of women differed from one another in their looking preferences. Specifically, normal cycling women (i.e., not on oral contraceptives) preferred viewing the genital lookzone more than any other lookzone, whereas women taking oral contraceptives preferred looking at the context lookzone more than any other lookzone. These differences suggest that visual attention to sexual stimuli may also vary as a function of hormonal influences. As our study did not take hormonal variations into account, comparisons on this factor

are not possible. Importantly, though, Rupp and Wallen (2007) found overall sex differences much in line with ours.

Likewise, Tsujimura et al. (2009) tracked gaze time in heterosexual Japanese men ($n = 11$) and women ($n = 11$) exposed to two different erotic videos. In response to the first video depicting a nude heterosexual couple kissing, men looked longer at the opposite sex actor than did women, whereas women looked longer at the same sex actor than men did. This finding is similar to the sex differences in viewing preferences found in Lykins et al. (2008) and in our study. The second video shown was more explicit, depicting nude heterosexual intercourse. In contrast to the first video, there were no significant differences found between men's and women's visual attention patterns. This is further evidence that the explicitness of sexual stimuli may mitigate sex differences in visual attention for erotic and non-erotic targets.

Finally, there is also evidence of sex differences in viewing patterns to supposedly non-sexual stimuli. For instance, Lykins, Meana and Strauss (2008) tracked gaze patterns in response to clothed heterosexual couples engaged in non-sexual daily activities (e.g., cooking together) and found that men visually preferred the opposite sex whereas women looked at both sexes evenly, just as they had in response to the sexual stimuli. This is not to say that clothed men and women are not imbued with a certain level of eroticism. Further afield, Alexander and Charles (2009) presented images of male and female faces, gender-linked toys (e.g., vehicles vs. dolls), and renderings of gender-linked play styles (e.g., rough and tumble play vs. pat-a-cake) and tracked viewing patterns in men ($n = 39$) and women ($n = 44$.) Men showed a significant visual preference for female faces over male faces, whereas women looked at both male and female faces with interest, similar to

findings discussed above. In response to images of gender-linked toys, women and men evidenced gender congruent preferences: women preferred looking at toys associated with girls and men preferred looking at toys associated with boys. However, in response to gender-linked play styles, men visually preferred images of rough-and-tumble play, whereas women were visually interested in all forms of play, similar to their diffuse attention pattern to faces. These sex differences in viewing patterns suggest that men and women may also differ in how they view stimuli linked to gender-roles, possibly linked to phenotypic-based preferences. Moreover, although these findings are less associated with adult sexuality and more linked to gender roles, a similar differential viewing pattern in response to same sex and opposite sex figures among men and women was replicated in this context also.

In sum, the sex-focused eye-tracking literature supports the finding that men and women evidence differential visual attention patterns in response to visual sexual stimuli. Moreover, most findings to date strongly suggests that heterosexual men show a strong preferential tendency to look at women instead of at men, whereas heterosexual women are far more diffuse in their visual attention patterns and are drawn to look at both women and men. Although there is evidence suggesting that these sex-based patterns are more complex and less straightforward when hormonal variations are taken into account (Rupp & Wallen 2007), the broad sex effect appears to be reliable.

Arousal-based Explanations for Sex Differences

Category-specificity. One explanation for this pattern of findings is that sex differences in visual attention to sexual stimuli may reflect sex differences in arousal patterns to sexual stimuli. For example, Chivers, Rieger, Latty and Bailey (2004)

investigated sex differences in arousal to visual sexual stimuli by showing erotic films depicting heterosexual (female-male) and homosexual (male-male and female-female) sexual activity (oral sex and intercourse) to men and women. Participants used a lever to continuously self-report their degree of subjective arousal to the film content while genital arousal was concurrently assessed in terms of genital vasocongestion. Men reported high subjective arousal and evidenced significant genital arousal in response to films depicting their preferred sexual objects and low subjective and genital arousal to non-preferred sexual objects. In contrast, women's subjective arousal reports did not consistently match their levels of genital arousal; in fact, 37% produced a weaker genital response to their self-reported sexual preference than to their non-preferred sexual targets. A subsequent investigation (Chivers & Bailey, 2005) replicated these findings and additionally found that women produced mild increases in genital arousal to a film depicting copulating Bonobo chimps (a non-preferred arousal target), whereas men did not. In both studies, men's pattern of sexual arousal was observed to be category specific (i.e., men aroused to their stated sexual preference), with high concordance between subjective and genital arousal. Women, however, exhibited a non-specific, or flexible, pattern of genital sexual arousal that often did not reflect their self-reported sexual preferences.

The current study found similar category specificity in men's visual attention to sexual stimuli in that men who reported being exclusively sexually attracted to women looked at depicted nude women nearly all of the time and looked at depicted nude men minimally. Likewise, there appeared to be category non-specificity in women's visual attention patterns. Women who reported exclusive sexual attraction to men preferred

looking at depicted nude men, but also showed substantial visual interest in depicted nude women, which was not their self-reported sexual target. The similarity in findings relative to sex differences in category specificity in arousal and visual attention suggests that arousal is one possible explanation for the current study findings. That would mean that men looked at women because they found them arousing, and that women looked at both men and women because, despite the fact that they claim to be aroused only by men, they were actually aroused by both men and women (i.e., low concordance between subjective and genital arousal in women) and therefore looked at both.

Female Erotic Plasticity. Further support for an arousal-based explanation for sex differences in visual attention to sexual stimuli can be found in evidence of sexual plasticity being greater in women than in men. Baumeister (2000) reviewed a large body of literature that he interpreted as demonstrating that female sexuality is more malleable than male sexuality, which appears to be narrowly focused and relatively unchanging across time and situations. Baumeister further proposed an evolutionary explanation of this sex difference. He hypothesized that female erotic plasticity might have evolved in response to a combination of three adaptive pressures. First, women are less physically strong than men and therefore have evolved to be flexible in many arenas, including sexuality, to survive and thrive in a male-dominated world. Second, as sexual gatekeepers, women's sexuality is fundamentally characterized by change. A no turns to a yes as women select mates. If this capacity for change is inherent in female sexuality, it probably generalizes to other forms of sexual flexibility in women. Third, because the female sex drive is inherently less hardy than that of men, it is more easily shaped, influenced and changed, by either internal or external factors. In other words, if sex is not

as important, preferences are not as strongly encoded. Baumeister's explanations for female sexual plasticity are not as solidly supported by data as the existence of female plasticity itself (e.g., research has shown a positive relationship between plasticity and high sex drive in women, [Lippa, 2006, 2007]). Explanations aside, the results of our study may constitute further support for female erotic plasticity, as women produced significantly more malleable visual attention patterns than did men. Perhaps women's evolved sexual plasticity extends to the level of visual attention.

Evidence for female sexual plasticity has also been discussed by Diamond (2003, 2005, 2008), who followed three groups of sexual minority women (lesbian, bisexual and unlabeled) across ten years to explore their identities, attractions and behaviors. Results revealed considerable fluidity in female sexual behavior across the three groups. Diamond concluded that sexuality in sexual minority women is best understood dimensionally rather than categorically (i.e., women can move fluidly between same-sex and opposite-sex relationships based on a number of factors, and do not fit neatly into stable sexual orientation categories) and suggested that this fluidity may generalize to female sexuality in general (Diamond, 2008). Diamond's findings on female sexual fluidity also align with the diffuse eye-tracking patterns found in our sample of heterosexual women. If female sexuality is fluid and based on dimensional factors, then it would make sense that heterosexual women would view both erotic targets and non-erotic targets with some level of arousal-based interest.

Identification. A different arousal-based explanation for sex differences in visual attention patterns is that female identification with the depicted sexualized women is responsible for women's more even pattern visual attention. Whereas men may look

directly at their depicted erotic targets (nude women), focusing on who they would like to have sex with, women may instead look for who they can identify with, imagining themselves as the woman depicted thus triggering arousal. In their investigation of how men and women respond to sexual films, Janssen, Carpenter and Graham (2003) found that the only variable impacting female sexual arousal was imagining themselves as the actress participating in the depicted sexual activity. Whereas men's arousal process appeared to involve objectification of their erotic target, women's arousal process was most impacted by their identification (subjectification) with the actresses in the erotic films. Although our protocol did not depict women engaged in partnered sexual activity, it remains possible that women's higher identification with nude women in erotic poses drew their visual attention for this reason. However, this explanation breaks down somewhat when you consider as Chivers, Seto and Blanchard (2007) do that women also robustly responded to sexual stimuli without an object of identification (e.g., Bonobo mating.)

Social Learning Explanation for Sex Differences

Although arousal-based explanations for the present study findings are compelling, it is also possible that differential arousal patterns in men and women can be explained by social learning forces. Social comparison theory (Festinger, 1954) posited that human beings compare themselves to others for the dual purposes of self-evaluation and self-improvement. With respect to body image, Myers and Crowther (2009) investigated the relationship between social comparison and body dissatisfaction via meta-analysis and found women to be far more impacted by this relationship than men. Because of the strength of this relationship and the significantly greater pressure on women to achieve a

beauty-ideal, women's urge for social comparison may win out over arousal when viewing images of nude men and women. They may simply be more interested in comparing their bodies to those of the depicted women than in looking at their sexual targets, nude men, particularly if feeling beautiful/thin/idealized is a prerequisite to feeling sexual at all.

Homo-erotic Anxiety Explanation for Sex Differences

Inversely, it is possible that homoerotic anxiety accounted for men's reticence to view images of nude males, thus resulting in men's categorical visual preference for nude women in the current study. Nevid (1983) showed homosexual erotic films to self-identified heterosexual participants ($n = 133$) and found that, overall, males responded more negatively to homoerotic stimuli than did women. Earlier work by Mosher and O'Grady (1979) found that male participants ($n = 215$) reported feeling substantial disgust, anger, shame, and guilt when watching male-on-male homosexual erotic films. In an experimental paradigm providing a visual choice, it seems reasonable that men would avoid looking at depicted nude males and focus almost exclusively on depicted nude females, if in fact the male images have negative affect potential.

Summary

Though each of these explanations may partially account for the results of the current study, the strongest appears to be the category-specificity hypothesis (Chivers et al., 2004), backed up by theories of female sexual plasticity (Baumeister, 2000; Diamond, 2008.) The relationship between visual attention and sexual arousal, however, is not yet completely understood or empirically established. Although there is evidence that visual attention can lead to sexual arousal (e.g., pervasive research use of visual sexual stimuli

to elicit arousal, pornography utilization rates), we do not know if visual attention to erotic stimuli is *indicative of* sexual arousal in and of itself. That is, when a participant preferentially attends to a particular region of visual sexual stimuli, it does not necessarily mean they are aroused by what they are looking at. It has been established that both men and women look more frequently and for longer durations at sexual stimuli as compared to non-sexual stimuli, which links visual attention and sexual interest (Lykins, Meana & Kambe; 2006). However, without simultaneous measures of sexual arousal, it can only be securely asserted that visual attention indicates interest. Concurrent measurement of genital arousal, subjective arousal, and visual attention in response to sexual stimuli would help clarify the link between arousal and visual attention. As to other explanations for the sex difference in visual attention (e.g., identification social comparison in women; homoerotic anxiety in men), protocols designed to directly test those theoretical explanations are needed.

Visual Attention Differences Among MtF Transsexuals, Men, and Women

As predicted based on extant research, heterosexual natal men and heterosexual natal women produced distinctive visual attention patterns when viewing sexual stimuli. The novel question ultimately posed in the current study, then, was would androphilic MtF transsexuals produce visual attention patterns similar to men, similar to women, or different from both? This sample of androphilic MtF transsexual participants produced visual attention patterns similar to that of men and significantly dissimilar to that of women. That is, androphilic MtF transsexuals looked more frequently and for longer durations at their erotic targets (nude men) as compared to their non-erotic targets (nude

women). Essentially, they emulated a male-like pattern of visual attention to erotic stimuli despite their female gender identification.

There are no other eye-tracking studies to date investigating visual attention to sexual stimuli in MtF transsexuals with which to directly compare these findings. However, Lawrence, Latty, Chivers and Bailey (2005) investigated subjective and genital arousal to sexual stimuli using a continuous response lever and vaginal photoplethysmography, respectively, in a sample of post-operative MtF transsexuals ($n = 11$) and natal women ($n = 72$). MtF transsexuals produced a male-like category-specific visual preference for their erotic targets, whereas natal women produced non-category specificity in their arousal patterns. Five androphilic MtF transsexual participants displayed greater subjective and genital arousal to depicted men, and six non-androphilic MtF participants categorically aroused to depicted women; however, androphilic transsexuals and women produced lower subjective-genital arousal concordance than did non-androphilic transsexuals. The yet-untested link between sexual arousal and visual attention precludes a direct comparison between Lawrence et al. (2005) and the current study, yet the results of both tell a similar story.

First, they show that MtF transsexuals behave with category specific attraction to erotic targets, and relative disinterest in non-erotic targets, when exposed to visual sexual stimuli. Second, concordance between self-reported sexual attraction and sexual response was somewhat unclear among MtF transsexuals in both studies, albeit in quite different ways. The current study excluded 7 MtF transsexuals because of discrepancies in self-reported sexual orientation and statements about preferred sexual partners, whereas Lawrence et al. (2005) found statistical differences in androphilic transsexuals' subjective

and genital forms of arousal. Nonetheless, the common uncertainty relative to self-reported subjective arousal suggests that the issue is complex and research is needed to understand self-reported sexual arousal in MtF transsexuals.

Even though the androphilic MtF transsexuals in the current study produced visual attention patterns significantly like men and unlike women, it is worth noting that their patterns were slightly less category-specific than men's. That is, they looked slightly less than men at their erotic targets (nude men) and slightly more than men at their non-erotic targets (nude women). Although the difference was minimal and the interpretation of non-significant differences is questionable, one possible explanation for the slight mitigation in category-specificity in the transsexual group is an aggregate effect of social, hormonal, behavioral, and identity-based "feminization" on visual attention to erotic stimuli. One way to explore this would be to track eye movements in stratified age groups of androphilic MtF transsexuals. If this aggregate effect of feminization does impact visual attention, there would likely be less category specificity in older groups (i.e., among those who have been feminized for longer periods of time, enough to effect cognitive processes at the level of visual attention). The current study did, however, explore potential differences between transsexual participants who were using feminizing hormones and those who were not, as per Rupp and Wallen's (2007) indication of hormonal variations in visual attention to sexual stimuli. Although results of the comparison between hormone and no-hormone transsexual groups here did not yield differences in visual attention patterns, additional research is warranted as feminizing hormones may produce an effect in larger samples.

Explanations for MtF Visual Attention Patterns

Category-specificity of sexual arousal in MtF transsexuals as an extension of category specificity in natal men provides a strong and plausible arousal-based explanation for the current study findings of category-specific visual attention patterns in MtF transsexuals (Chivers et al., 2004; Lawrence et al., 2008). Despite having some merit in understanding women's visual attention patterns (i.e., women were drawn to imagine themselves as the depicted woman, thus showed visual attention to women), the identification hypothesis is not a suitable alternate arousal-based explanation for androphilic MtF transsexuals. If androphilic MtF transsexuals were prone to arousal via identification with the depicted woman, a pattern of visual interest in the depicted women would have emerged, which it did not. Because androphilic MtF transsexuals identify as women, there would be no reason for them to be sexually interested in imagining themselves as the depicted man.

In terms of non-arousal-based explanations for androphilic MtF visual attention patterns, social comparison theory (Festinger, 1954) might predict that this group would look at depicted women to self-evaluate and to strategize self-improvement. That androphilic MtF transsexuals did not look at depicted women was somewhat surprising as one might expect MtF transsexuals to be even more motivated than natal women to compare their bodies to images of sexually idealized women. Social comparison theory may be more operative among autogynephilic MtF transsexuals, as this subgroup is definitionally characterized as preoccupied with the female physical form. In studying social comparison in autogynephiles, it would be challenging to tease apart arousal to the female form, identification with the female form and social comparison with the female form. In androphilic MtF transsexuals, however, the situation appears to be less complex

because the sexual orientation is exclusively toward men and the visual interest was almost exclusively in men.

Finally, homoerotic anxiety is an unlikely explanation for androphilic MtF transsexual visual attention patterns as this is not a commonly documented phenomenon in women, as it is in men. Androphilic MtF transsexuals identify as women and for homoerotic anxiety to account for the lack of visual interest in depicted women would suggest that the urge not to look at women accounted for the substantial looking at men. Lawrence et al. (2005) has established that MtF transsexuals become substantially more sexually aroused to their erotic targets than to their non-erotic targets; for homoerotic anxiety to account for the current study findings, it would have to supersede arousal as a driving force, which is unlikely.

Although the androphilic MtF transsexuals produced slightly less polarized visual attention patterns than men, that difference was not statistically significant at any level. Results clearly show a strong similarity in visual attention patterns of androphilic MtF transsexuals and men and a significant difference between those of androphilic MtF transsexuals and women. Category-specific visual attention to erotic targets (nude men) found here in androphilic MtF transsexuals is very likely a cognitive extension of the category-specificity of sexual arousal identified by Lawrence et al. (2005). The implication of this is that androphilic MtF transsexuals are more like men in their visual processing of sexual stimuli: they tend to look exclusively at the individual to whom they are sexually attracted, a pattern markedly unlike that of women.

Implications of these findings with respect to the three theories of transsexualism presented earlier are discussed next: 1) Blanchard's typology of transsexualism, 2) the

Feminine Essence Narrative, and 3) Ekins and King's conceptualization of transsexualism as "gender migration."

Theoretical Implications

Blanchard's Typology

One of the core purposes of this study was to explore Blanchard's typology of transsexualism by comparing visual attention patterns to erotic stimuli among men, women, and MtF transsexuals. In an ideal design, both androphilic and autogynephilic MtF transsexuals would have been compared to natal men and women, testing the prediction that both groups of transsexuals would produce male-like category specific visual attention patterns, the former (androphilic) focused on men and the latter (autogynephilic) focused on women, per Blanchard's original conceptualization. In the present study, however, we collected eye-tracking data only from a group of androphilic MtF transsexuals and compared this with men's and women's data.

Blanchard (1989) originally characterized androphilic MtF transsexuals as the more feminine of the two MtF transsexual groups, noting that they experience early onset of feminine behaviors and interests, exhibit life-long exclusive sexual attraction toward men, appear more naturally feminine in physical structure and movement, pursue hormone therapy and SRS at earlier ages, more naturally "pass" as women, and pursue work in traditionally feminine fields. In later work, Blanchard (2008) stated that he suspected androphilic MtF transsexuals to have sexually dimorphic brain structures shifted in the female direction. He posited that this might account for the observed feminine characteristics, a finding that was recently confirmed via fMRI research

(Rametti et al., 2011; Savic & Arver, 2011). However, Blanchard retained allegiance to a typology of transsexualism based on sexual orientation, which would predict androphilic MtF transsexuals—who likely feature some female-like brain characteristics—to exhibit categorical sexual attraction to males. Lawrence et al. (2005) confirmed this in finding that the androphilic subset of their MtF transsexual group evidenced category-specific sexual arousal to men.

The current study findings can be interpreted as additional support for category-specificity to sexual stimuli in androphilic MtF transsexuals, extending it to the level of visual attention. Blanchard’s typology is thus supported by the current study findings, although visual attention to sexual stimuli does not appear to be influenced by the presence of female-like brain characteristics. If this were the case, androphilic MtF transsexuals would not have produced significantly male-like visual attention patterns in response to sexual stimuli. Moreover, the current study findings can also be seen to support the conceptualization of androphilic MtF transsexuals as “a subset of homosexual males” (Bailey & Tricia, 2007; p.524). In other words, androphilic MtF transsexuals may represent a particular variation of natal male sexuality, characterized by extreme expressions of homosexuality.

A question often asked relative to Blanchard’s typology is: Is it valid and/or useful to categorize MtF transsexuals based on sexual orientation? Although it is not possible to determine the validity of the typology based solely on eye-tracking data (and particularly without data on visual attention patterns in both transsexual groups), the recruitment experience did yield insight into the applied utility of the typology, at least for research purposes. Four lines of inquiry were used in the current study to try to ascertain either

androphilic or autogynephilic sexual orientation in our MtF transsexual participants: 1) the Kinsey sexual orientation scale, 2) the Core Autogynephilia scale, 3) preferred sexual partner questions, and 4) age of onset questions. Despite this multi-pronged effort, participant responses were so mixed that it was difficult to reliably operationalize the typology in a manner that would allow for confident grouping of MtF transsexual participants based on sexual orientation. Surprisingly, responses to the Core Autogynephilia Scale were particularly mixed and not clearly congruent with self-reported sexual orientation, preferred sexual partner, or age of onset, as would be theoretically expected. Therefore the decision was made to anchor on Kinsey scale scores so that we could, at least, confidently typify our sample in terms of sexual orientation. Unfortunately, this strategy excluded one-third of MtF transsexual participants from the data analyses because they could not be reliably grouped.

This experience does not suggest that Blanchard's typology is inaccurate; instead, factors including social-desirability, differences in identity development, long standing suspicion toward scientific research on sexuality, and identity politics all likely play a role in obscuring accurate self-report regarding sexual preferences and history. Although Blanchard's typology may do an excellent job of describing two distinct groups within the MtF transsexual population, this brief experience indicates that more work needs to be done in terms of developing a measure that can be used to reliably group MtF's so that research can progress in this area.

Feminine Essence Narrative

The theory most often cited as a counter-point to Blanchard's typology of transsexualism is known as the Feminine Essence Narrative. Broadly, the Feminine

Essence Narrative asserts that all MtF transsexuals are fundamentally “women trapped in men’s bodies.” Ironically, it was Blanchard (2008) who articulated the tenets of the theory such that it might be investigated empirically: 1) MtF transsexuals are women in men’s bodies, 2) there is only one type of woman so there is only one type of transsexual, 3) differences among MtF transsexuals are superficial as compared to the underlying unity of transsexualism, 4) MtF transsexuals do not have any characteristics that either men or women do not possess.

The current study findings that androphilic MtF transsexuals produced visual attention patterns most like men and unlike women contradicts the Feminine Essence Narrative’s assertion that MtF transsexuals are women trapped in men’s bodies; if this were true there would be a female-like visual attention pattern in androphilic MtF transsexuals. Moreover, of the two groups of transsexuals, the androphilic group would have the greatest possibility of producing a female-like gaze pattern in response to erotic stimuli, as they feature more feminine characteristics and now have been shown to have some female-shifted sexually dimorphic brain characteristics. That this sample of androphilic MtF transsexuals produced strong male-like category-specific visual attention patterns reduces the probability that the Feminine Essence Narrative applies to any type of MtF transsexual. If it does not apply to the most feminine transsexual group, to whom might it apply?

Though the current study results are at odds with the Feminine Essence Narrative, the discrepancy illuminates an important distinction between functioning (vis-a-vis visual attention) and subjective experience (feeling one is essentially a woman). Just because a person feels in every way a woman does not mean that person’s cognition (or physiology,

for that matter) operates the way a woman's would. Thus, it is possible both to experience oneself as a woman and to produce visual attention patterns like a man. Moreover, that this group of MtF transsexual participants experienced themselves as women *and* simultaneously exhibited a form of cognitive processing (visual attention) in the manner of natal men may help explain the distress inherent in gender dysphoria. It might indeed be very difficult to feel like a woman but to function like a man. However, the solution to this difficulty is not to ignore the functional aspect of existence and base reality on subjective experience alone.

The Feminine Essence Narrative may be best conceptualized as a subjective experience that some MtF transsexuals experience, but the bulk of data, including the current study findings, show that it is not a satisfactory theoretical explanation of MtF transsexualism. Instead, it appears that MtF transsexualism is best explained by a combination of biopsychosocial factors and the fact that members of this group will exhibit a mixture of male-typical and female-typical characteristics (Lawrence, Latty, Chivers, & Bailey 2005; Blanchard, 2008).

Gender Migration?

In addition to Blanchard's typology and the Feminine Essence Narrative, a third theoretical perspective on transsexualism was proposed by Ekins and King (2001; 2006). This broad framework is not at odds with Blanchard's typology or with the Feminine Essence Narrative, as it conceptualizes transsexualism as an ongoing process in which sex, gender identity and social experiences continually interact to shape transsexual experience. Ekins and King (2006) also discuss transsexualism in terms of "gender migration" to convey the process of moving from one gender to another and utilize the

umbrella term “transgendering” to refer to all processes involving experiences outside the gender binary. Thus, transgendering can include Blanchard’s concept of autogynephilia, although it does not espouse a fixed typology of transsexualism hinging on androphilic and autogynephilic sexual orientations. The framework also encompasses the Feminine Essence Narrative as one of many possible transsexual identity experiences, but does not propose that this experience lies at the heart of all transsexual experience.

From this perspective, the current study findings would be interpreted to suggest that while MtF transsexuals who are experiencing androphilia at a given time in their “transgendering” process look at nude men and do not look at nude women, this may change. Because transsexualism is a process of gender migration shaped by social forces, the same group of MtF transsexuals may not evidence the same visual attention patterns to erotic stimuli over time. This might be a plausible interpretation of the current study findings if all of our participants happened to be at approximately the same stage of gender migration and if there were no other evidence for the stability of androphilic transsexualism; however, research has established its longitudinal existence (see Bailey, 2003).

Limitations

The present study could have been improved in a number of ways. First, a larger sample of androphilic MtF transsexuals would have provided additional stability and power to our findings; however, small sample sizes are common in research (especially non-self-report) involving MtF transsexuals due to low population prevalence and recruitment challenges. There are also a large number of data points per subject and eye-

tracking research typically involves samples this size, not to mention that our effect sizes were large. Second, adding autogynephilic MtF transsexuals as a fourth group would have provided valuable insight into Blanchard's typology. Without data from this group we could not directly "test" the two-group model via eye-tracking, nor explore how autogynephilia and androphilia might be differentially associated with visual attention patterns to erotic stimuli. Third, it would be useful to empirically establish whether or not our visual sexual stimuli were subjectively arousing. In light of the popular pornography sources (Playboy and Falcon Studios) from which the stimuli emanated, it seems reasonable to assume that the stimuli were at the very least sexually interesting, if not arousing, to participants. Fourth, we do not yet have a clear understanding of the exact relationship between visual attention and sexual arousal, which means that conclusions about visual attention to sexual stimuli could refer either to visual interest alone or to sexual interest. It would be useful to better understand this relationship so that eye-tracking data in response to sexual stimuli can be interpreted in a more nuanced and definitive manner.

Future Research

It is recommended that future studies compare visual attention patterns to sexual stimuli among additional groups, for instance: heterosexual men, gay men, heterosexual women, lesbians, androphilic MtF transsexuals, and autogynephilic MtF transsexuals. Comparative data from these groups would facilitate a thorough investigation of Blanchard's typology as well as the vicissitudes of category-specificity at the level of visual attention. Additionally, comparisons among pre-operative and post-operative

transsexual groups would be useful, as well as transsexual groups differentiated by hormone use, as these groups may vary significantly from one another. Along these lines, substantial improvements to grouping MtF transsexuals are recommended. Development of a thorough measure with content and construct validity designed to reliably ascertain core sexual orientation, age of onset, autogynephilia, androphilia, and gender identity development would facilitate research with this population.

Utilizing measures of subjective and physiological arousal concurrently with eye-tracking methodology is strongly recommended to help clarify the relationship between visual attention and sexual arousal. Although the continuous response lever is frequently used as a measure of subjective arousal, another approach would be to use experience sampling or think aloud approaches to gather data on subjective experience (which may or may not include arousal). By priming the lever use with an instruction to indicate level of arousal, it is not possible to know what participants might experience “unprimed” while attending to erotic stimuli. Stream-of-consciousness and phenomenological approaches may yield surprising and novel results. For instance, relative to the identification hypothesis, a think aloud protocol would be very useful in ascertaining whether or not women do become aroused by imagining themselves as the depicted nude women, or if they are involved in body-comparisons. The drawbacks to these approaches are that they are time consuming and, as they yield narrative data, are subject to the pitfalls of qualitative analysis. To explore the relative utility of these methods in sexual stimuli studies, a simple two-group design could compare data derived from the arousal lever to that derived through think-aloud or experience sampling.

Another area of recommended research is detailed exploration of different types of sexual stimuli for eye-tracking (and other measures). Still photographs vs. movie clips, sexually explicit vs. sexually suggestive images, concurrent auditory stimuli vs. silence, side-by-side visual presentations vs. interacting couples/groups may each have different effects on different groups of individuals. There is scattered evidence for the differential effects of different stimuli, making it difficult to make accurate cross-study comparisons. Additionally, some standardization of lookzone delineation, selection of visual attention dependent measures, slide presentation time and data analysis would enable collaboration among eye-tracking labs focused on human sexuality research.

TABLE 1

<i>Diagnostic Criteria for Gender Identity Disorder and Transsexualism</i>	
DSM-IV, 302.85 Gender Identity Disorder	
A.	A strong and persistent cross-gender identification (not merely a desire for any perceived cultural advantages of being the other sex). In children, the disturbance is manifested by four (or more) of the following: <ol style="list-style-type: none"> (1) Repeatedly stated desire to be, or insistence that he or she is, the other sex (2) In boys, preference for cross-dressing or simulating female attire; in girls, insistence on wearing only stereotypical masculine clothing (3) Strong and persistent preferences for cross-sex roles in make-believe play or persistent fantasies of being the other sex (4) Intense desire to participate in the stereotypical games and pastimes of the other sex (5) Strong preference for playmates of the other sex. In adolescents and adults, the disturbance is manifested by symptoms such as a stated desire to be the other sex, frequent passing as the other sex, desire to live or be treated as the other sex, or the conviction that he or she has the typical feelings and reactions of the other sex.
B.	Persistent discomfort with his or her sex or sense of inappropriateness in the gender role of that sex. In children, the disturbance is manifested by any of the following: in boys, assertion that his penis or testes are disgusting or will disappear or assertion that it would be better not to have a penis, or aversion toward rough-and-tumble play and rejection of male stereotypical toys, games, and activities; in girls, rejection of urinating in a sitting position, assertion that she has or will grow a penis, or assertion that she does not want to grow breasts or menstruate, or marked aversion toward normative feminine clothing. In adolescents and adults, the disturbance is manifested by symptoms such as preoccupation with getting rid of primary and secondary sex characteristics (e.g., request for hormones, surgery, or other procedures to physically alter sexual characteristics to simulate the other sex) or belief that he or she was born the wrong sex.
C.	The disturbance is not concurrent with a physical intersex condition.
D.	The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
<i>Note.</i> From Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision, by the American Psychiatric Association, 2000, Washington, DC: Author. Copyright 2000 American Psychiatric Association.	
ICD-10, F64.0 Transsexualism	
A desire to live and be accepted as a member of the opposite sex, usually accompanied by a sense of discomfort with, or inappropriateness of, one's anatomic sex and a wish to have hormonal treatment and surgery to make one's body as congruent as possible with the preferred sex.	
<i>Diagnostic guidelines:</i> For this diagnosis to be made, the transsexual identity should have been present persistently for at least 2 years, and must not be a symptom of another mental disorder, such as schizophrenia, or associated with any intersex, genetic, or sex chromosome abnormality.	
<i>Note.</i> From International Statistical Classification of Diseases and Related Health Problems, tenth revision, by World Health Organization, 1992, Geneva, Switzerland: Author. Copyright 1992 World Health Organization.	

TABLE 2

Participant Sociodemographic Characteristics

	Women (n = 20)	Men (n = 20)	MtF Transsexuals (n = 13)
	n (%)	n (%)	n (%)
Age			
21-30	13 (65)	9 (45)	0 (0)
31-40	6 (30)	8 (40)	8 (61.5)
41-50	1 (5)	3 (15)	4 (30.8)
51-60	0 (0)	0 (0)	1 (7.7)
Ethnicity			
White	15 (75)	14 (70)	3 (23.1)
Black	1 (5)	0 (0)	2 (15.4)
Asian	1 (5)	4 (20)	1 (7.7)
Hispanic	1 (5)	2 (10)	5 (38.5)
Native American	1 (5)	0 (0)	1 (7.7)
Mixed	1 (5)	0 (0)	1 (7.7)
Religion			
Christian	8 (40)	5 (25)	8 (61.5)
Jewish	0 (0)	1 (5)	0 (0)
Muslim	0 (0)	1 (5)	0 (0)
Buddhist	1 (5)	0 (0)	0 (0)
Spiritual	2 (10)	0 (0)	4 (30.8)
Agnostic/Atheist	9 (45)	13 (65)	1 (7.7)
Education			
Middle school	0 (0)	0 (0)	1 (7.7)
Some high school	0 (0)	0 (0)	3 (23.1)
High school diploma	1 (5)	1 (5)	4 (30.8)
Some college	0 (0)	8 (40)	3 (23.1)
College degree	4 (20)	4 (20)	2 (15.4)
Some graduate school	3 (15)	2 (10)	0 (0)
Masters degree	9 (45)	3 (15)	0 (0)
Doctoral degree	3 (15)	2 (10)	0 (0)
Income			
0-19,000	11 (55)	7 (35)	2 (15.4)
20,000-39,000	1 (5)	3 (15)	4 (30.8)
40,000-59,000	2 (10)	2 (10)	1 (7.7)
60,000-79,000	2 (10)	1 (5)	0 (0)
80,000-99,000	0 (0)	3 (15)	0 (0)
100,000+	4 (20)	4 (20)	1 (7.7)

TABLE 3

Hormone Use, Sex Reassignment Surgery (SRS) and Cosmetic Procedures in MtF Transsexual Participants

Participant	Hormones	Surgery	Cosmetic procedures
1	No	No	No
2	No	No	No
3	Yes	No	No; future
4	No	No	No
5	No	Yes; breasts	Yes; facial feminization
6	No	No	No
7	Yes	No	No
8	Yes	Yes; breasts and genitals	Yes; silicone injections
9	Yes	Yes; breasts	No
10	Yes	Yes; breasts	Yes; laser hair removal; Botox
11	No	Yes; breasts	Yes; nose, gluteus; laser
12	Yes	Yes; breasts	Yes; silicone injection; hips, gluteus, face
13	Yes	Yes; breasts and genitals	No

TABLE 4

Sexual Orientation, Autogynephilia, Age of Onset and Marriage History in MtF Transsexual Participants

Participant	Kinsey ¹	Stated erotic target ²	CAS ³	Age of onset ²	Marriage history ²
1	0	men only	0	under 25	never
2	0	men	8	34	never
3	0	prefer men	2	under 25	married
4	1	men; "men more"	0	between 25 and 36	never
5	1	men	4	over 40	married
6	0	prefer men	7	37	married
7	0	men	8	right around 40	married
8	0	men	0	17	never
9	0	men	0	hormones at 13	-- ⁴
10	0	men	4	22	never
11	0	men only	0	30	never but has kids
12	1	men	0	under 25	never
13	0	men	4	over 40	married now

¹Kinsey scores obtained via written self-report; scores of 0 and 1 indicated exclusive or nearly exclusive attraction to men. ²Stated erotic target, age of onset, and marriage history (to a natal woman) obtained during verbal semi-structured interview. ³Core Autogynephilia Scale (Blanchard, 1998) scores obtained via written self-report. Total scores range from zero (no autogynephilia) to eight (significant autogynephilia). Blanchard found an average score of five on the CAS among autogynephilic participants. ⁴Missing data, participant declined to answer.

TABLE 5

Means and SDs for Women, Men and MtF Transsexuals: Total Fixation Duration (ms) as a Function of Target and Region

Target by region	Women (n = 20)		Men (n = 20)		MtF transsexuals (n = 13)		All participants (n = 53)	
	M	SD	M	SD	M	SD	M	SD
Erotic								
Face	2082.96	544.10	2659.28	937.82	2277.15	878.84	2348.07	820.55
Body	4068.49	1103.45	6780.11	2045.20	5709.70	2228.29	5494.30	2132.71
Both	3075.73	642.71	4719.69	2465.07	3993.42	1118.94	3921.19	1231.42
Non-erotic								
Face	1308.95	450.91	489.24	391.82	761.66	468.82	865.38	560.26
Body	2889.75	1060.98	876.16	765.20	1370.42	838.23	1757.24	1271.49
Both	2099.35	643.19	682.70	1132.91	1066.04	621.00	1311.31	873.65
Both								
Face	1695.96	285.67	1574.26	919.54	1519.40	1088.59	1606.73	850.40
Body	3479.12	720.67	3828.13	1682.90	3540.06	1931.88	3625.77	1660.91
Both	2587.54	314.89	2701.19	972.91	2529.73	898.10	2616.25	834.72

TABLE 6

Analysis of Variance on Total Fixation Duration for 3-way Interaction (Group x Target x Region)

Source	<i>df</i>	<i>F</i>	<i>Partial eta-squared</i>	<i>p</i>
<i>Between subjects</i>				
Group (G)	2	<1	.028	ns
G within-group error	50	(70.40)		
<i>Within subjects</i>				
Target (T)	1	169.00	.772	.000***
Region (R)	1	199.13	.799	.000***
G x T	2	22.62	.475	.000***
T x R	1	66.59	.571	.000***
G x R	2	1.06	.041	.353*
G x T x R	2	14.15	.361	.000***
T within-group error	50	(210.89)		
R within-group error	50	(104.16)		
T x R within-group error	50	(102.87)		

Note. Values in parentheses represent mean square errors. * $p < .05$. ** $p < .01$. *** $p < .001$.

FIGURE 1

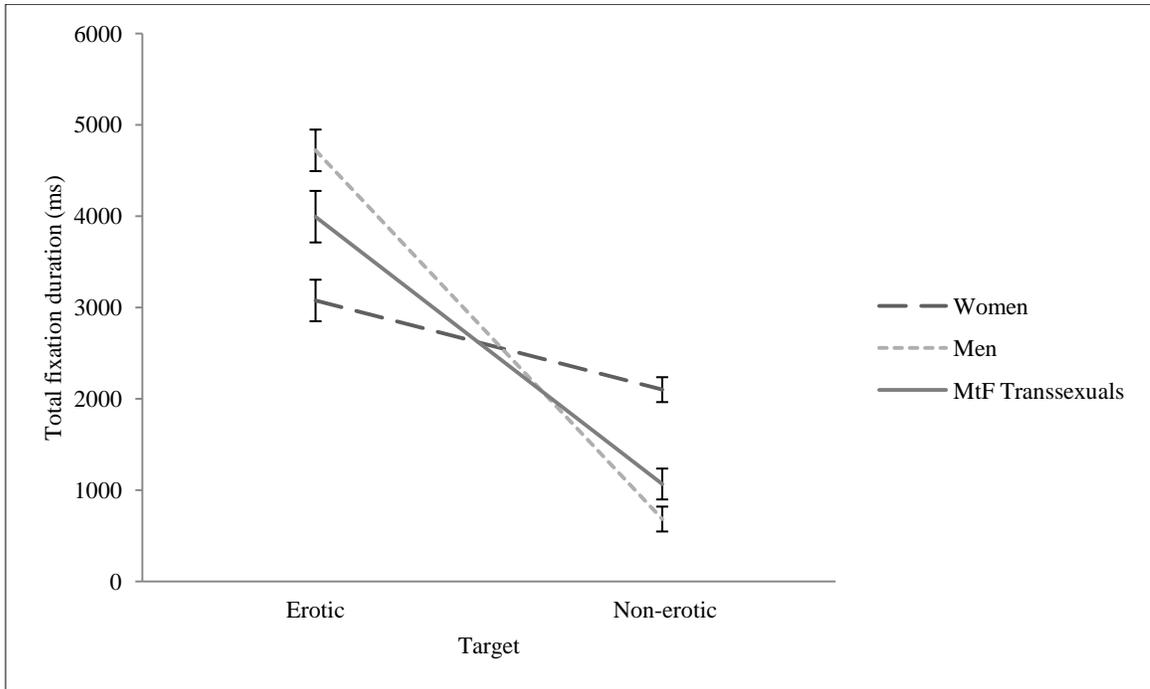


Figure 1. Group x Target Interaction for Total Fixation Duration

FIGURE 2

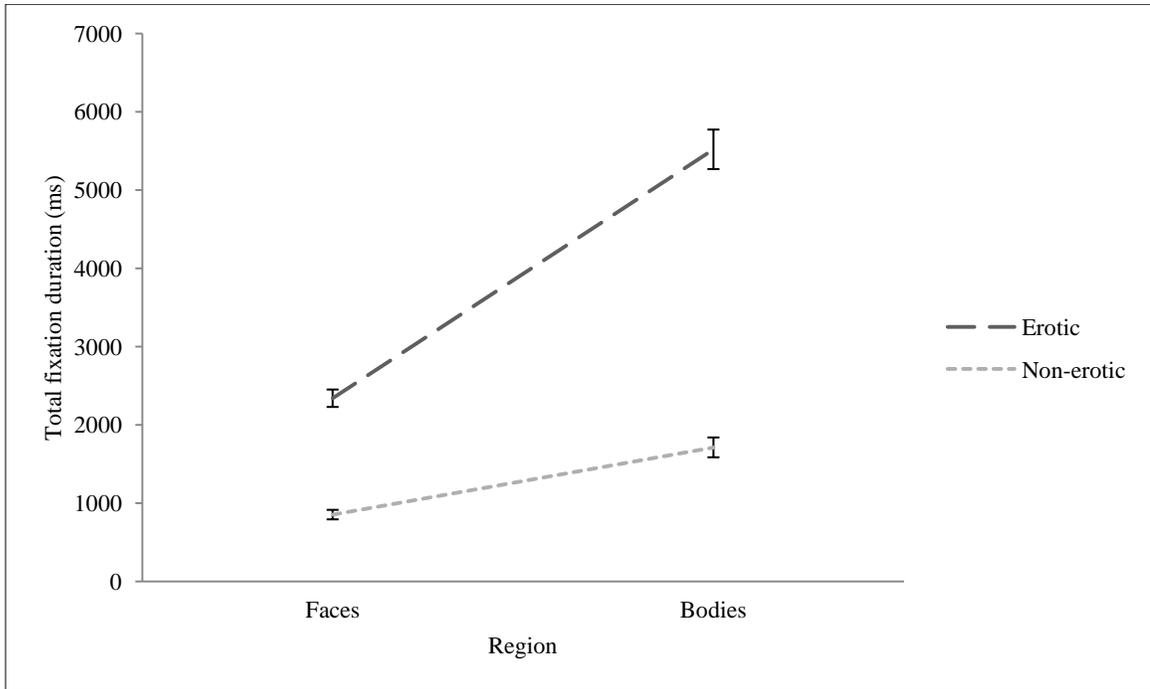


Figure 2. Target x Region Interaction for Total Fixation Duration

FIGURE 3

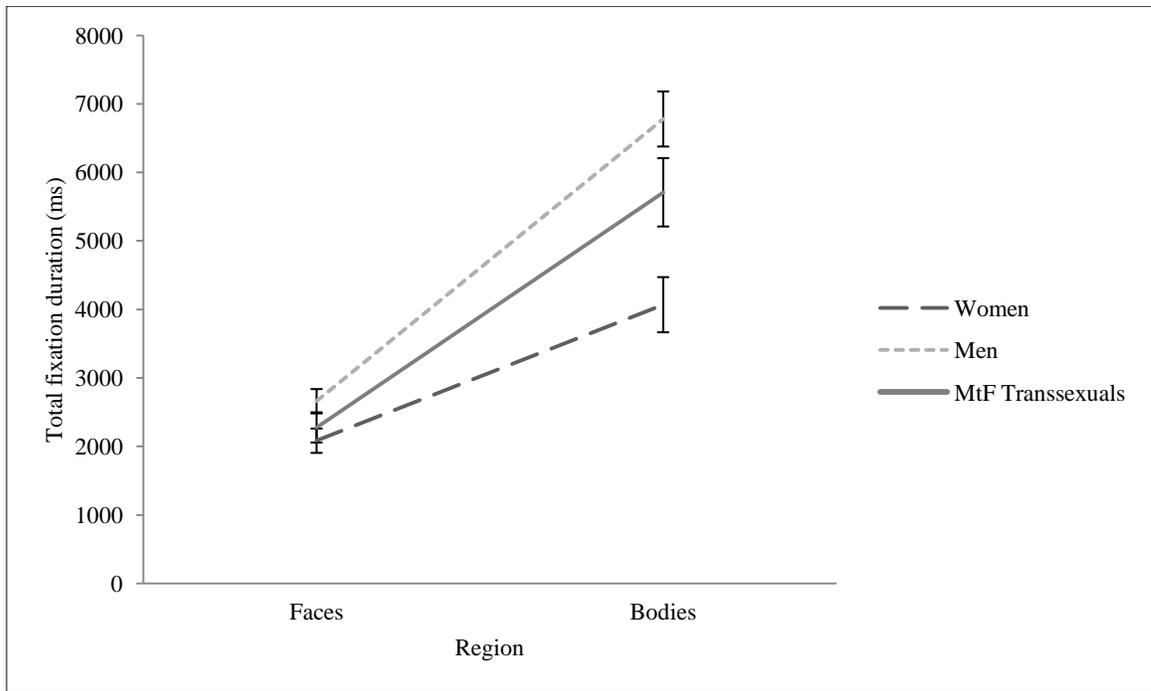


Figure 3. Group x Region Interaction in Total Fixation Duration on Erotic Targets

FIGURE 4

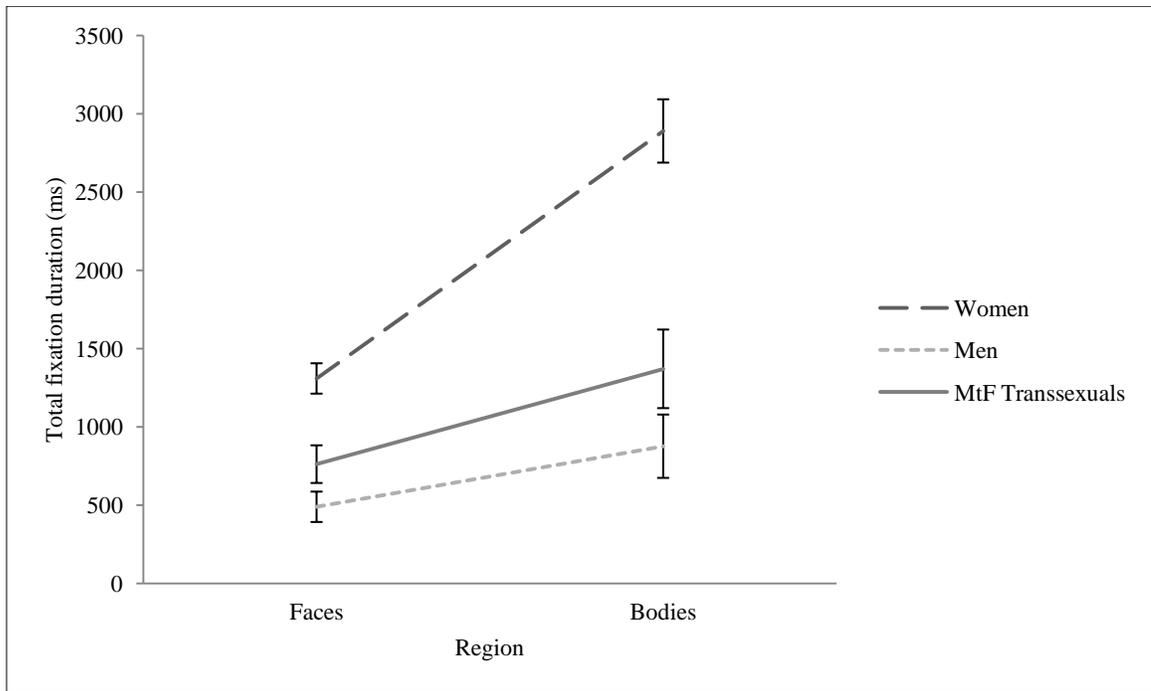


Figure 4. Group x Region Interaction in Total Fixation Duration on Non-erotic Targets

FIGURE 5

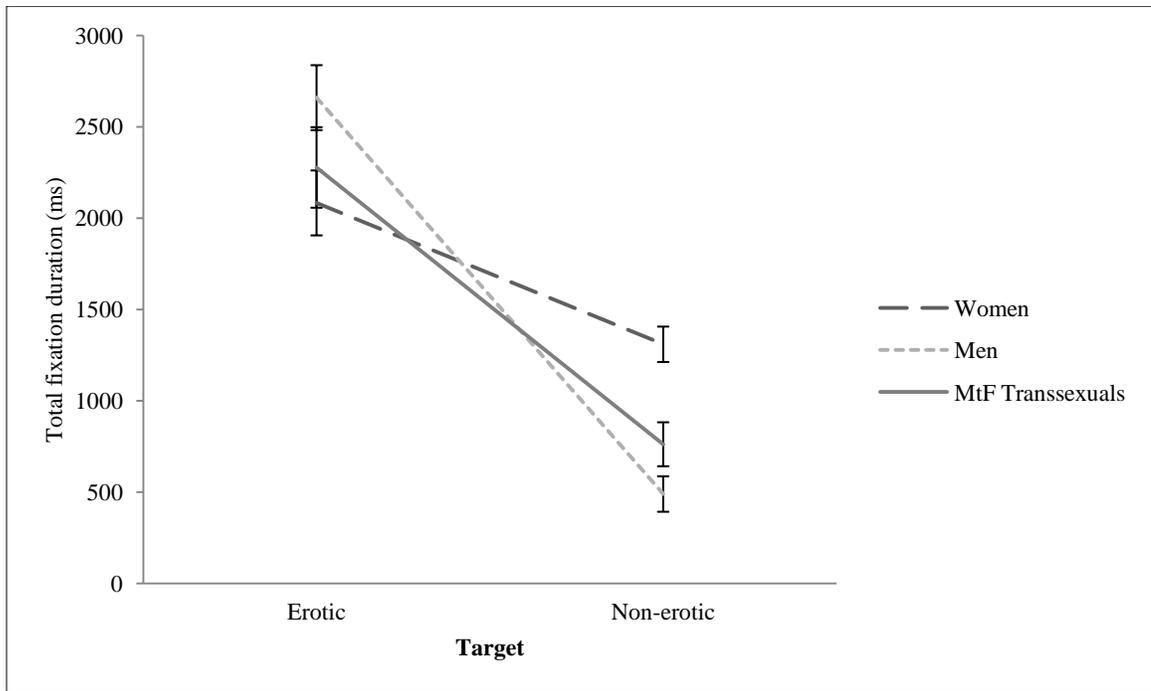


Figure 5. Group x Target Interaction in Total Fixation Duration on Faces

FIGURE 6

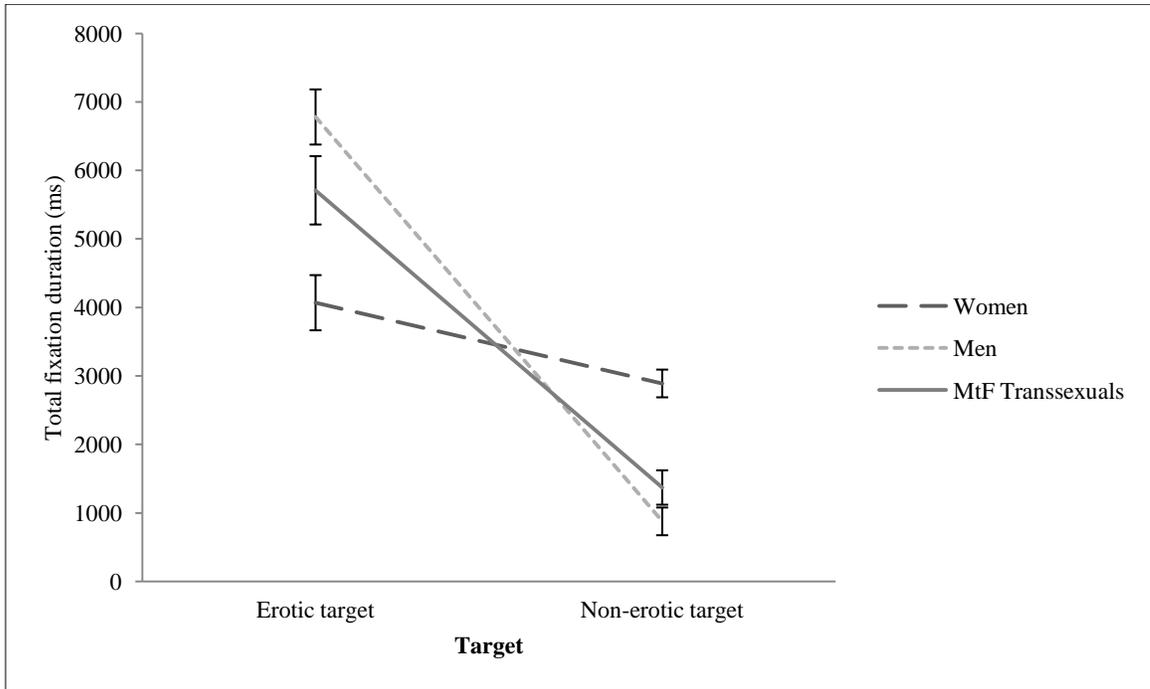


Figure 6. Group x Target Interaction in Total Fixation Duration on Bodies

TABLE 7

Means and SDs for Women, Men and MtF Transsexuals: Number of Fixations as a Function of Target and Region

Target by region	Women (n = 20)		Men (n = 20)		MtF transsexuals (n = 13)		All participants (n = 53)	
	M	SD	M	SD	M	SD	M	SD
Erotic								
Face	43.80	12.26	49.70	11.22	46.39	18.70	46.66	13.72
Body	118.70	31.04	167.75	37.59	149.69	43.67	144.81	42.18
Both	81.25	18.54	108.73	19.91	98.04	24.80	95.74	23.65
Non-erotic								
Face	31.35	9.41	13.70	9.66	20.15	9.42	21.94	12.16
Body	83.80	27.57	31.05	23.37	45.85	25.01	54.59	34.38
Both	57.58	16.31	22.38	16.29	33.00	16.35	38.26	22.43
Both								
Face	37.58	15.55	31.70	13.66	33.27	19.61	34.30	16.53
Body	101.5	40.68	99.40	33.93	97.77	32.54	99.70	35.74
Both	69.41	22.03	65.55	17.75	65.52	15.97	67.00	19.12

TABLE 8

Analysis of Variance on Number of Fixations for 3-way Interaction (Group x Target x Region)

Source	<i>df</i>	<i>F</i>	<i>Partial eta-squared</i>	<i>p</i>
<i>Between subjects</i>				
Group (G)	2	1.02	.039	ns
G within-group error	50	(373.95)		
<i>Within subjects</i>				
Target (T)	1	169.08	.772	.001***
Region (R)	1	513.25	.911	.001***
G x T	2	19.65	.440	.001***
T x R	1	120.15	.706	.001***
G x R	2	.21	.008	ns
G x T x R	2	16.81	.402	.001***
T within-group error	50	(1024.53)		
R within-group error	50	(422.52)		
T x R within-group error	50	(474.04)		

Note. Values in parentheses represent mean square errors. * $p < .05$. ** $p < .01$. *** $p < .001$

FIGURE 7

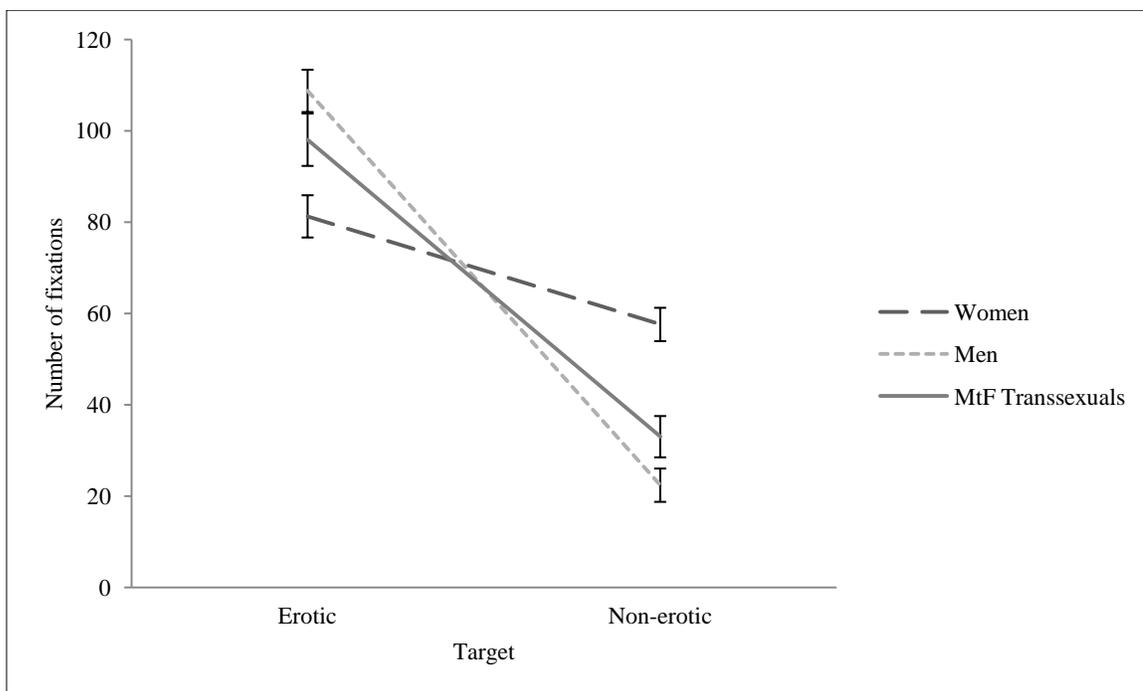


Figure 7. Group x Target Interaction for Number of Fixations

FIGURE 8

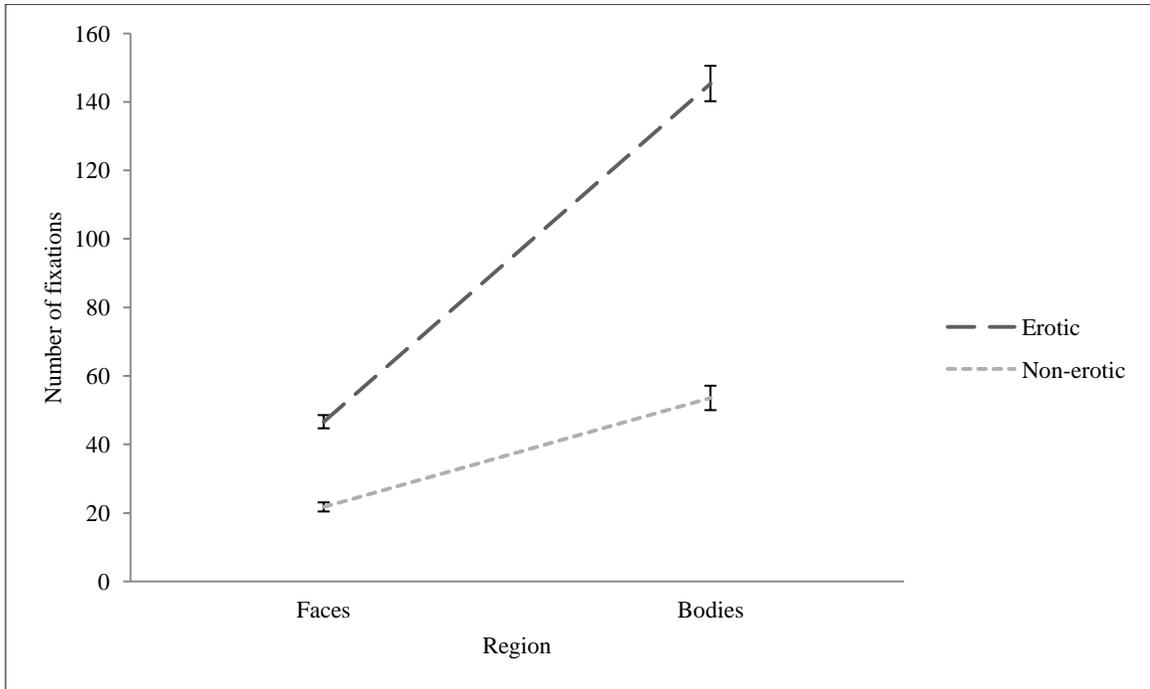


Figure 8. Target x Region Interaction for Number of Fixations

FIGURE 9

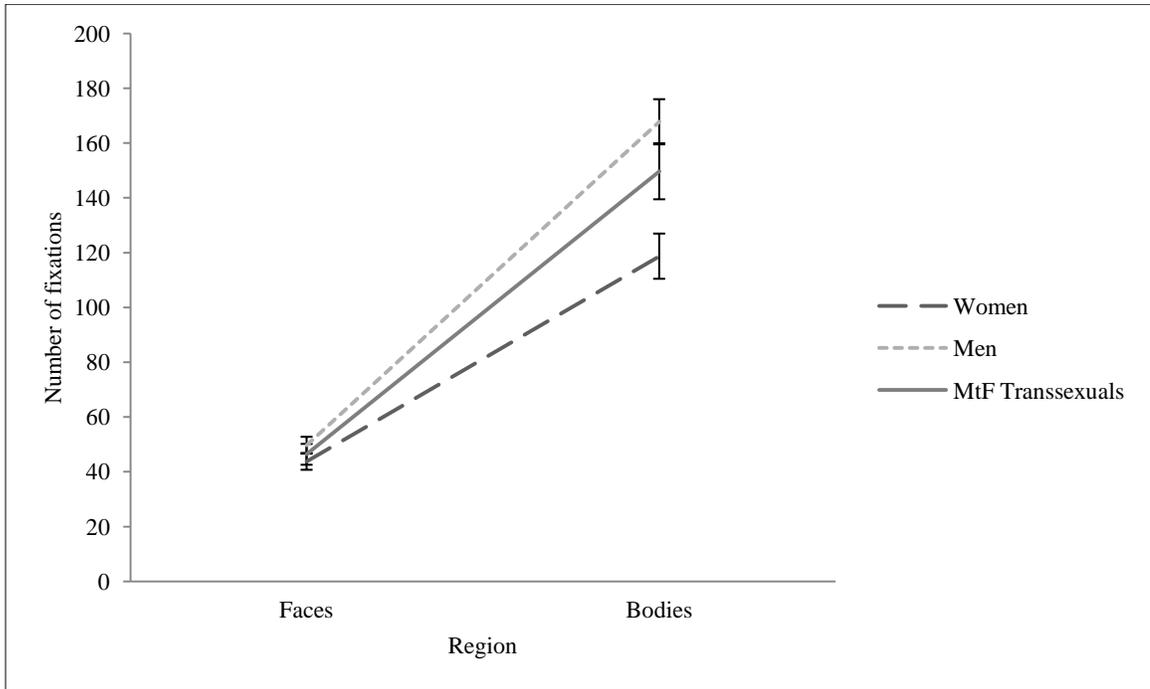


Figure 9. Group x Region Interaction in Number of Fixations on Erotic Targets

FIGURE 10

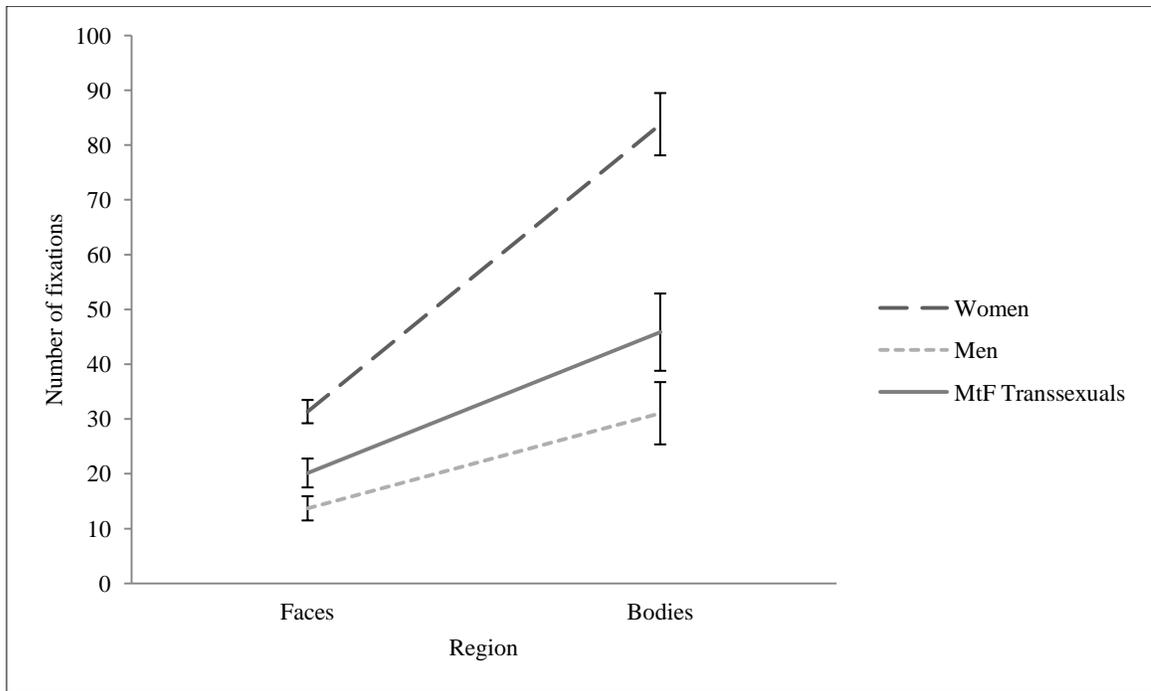


Figure 10. Group x Region Interaction in Number of Fixations on Non-erotic Targets

FIGURE 11

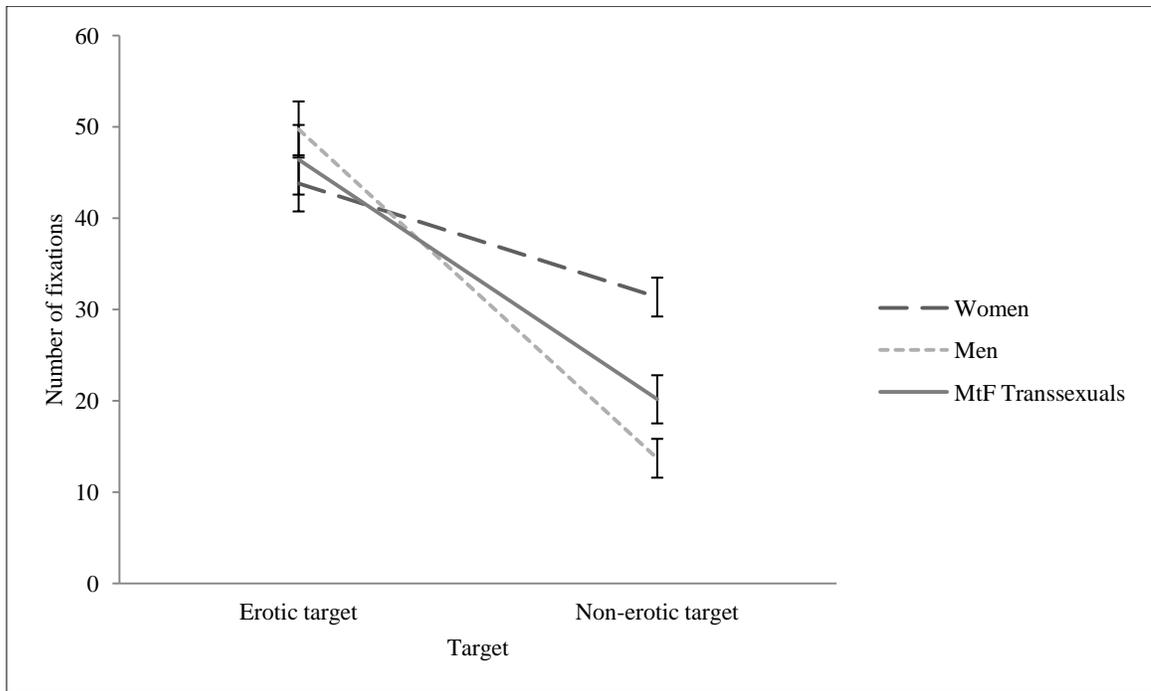


Figure 11. Group x Target Interaction in Number of Fixations on Faces

FIGURE 12

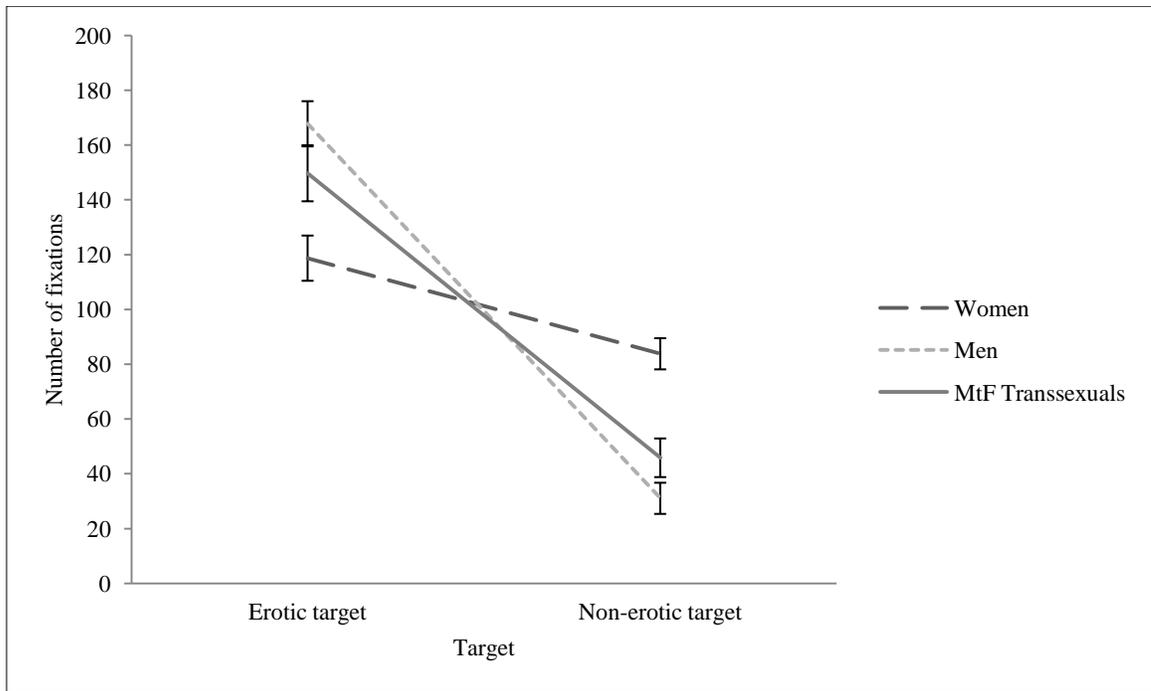


Figure 12. Group x Target Interaction in Number of Fixations on Bodies

Appendix A: Post Experimental Questionnaire for Natal Men and Women

1. What is your age? _____
2. What is your gender?
 - a. Male
 - b. Female
3. What is your ethnicity? _____
4. What is your religious affiliation? _____
5. What kind of job do you do? _____
6. What is your average annual income? _____
7. What is your highest level of education?
 - a. Middle school
 - b. Some high school
 - c. High school degree
 - d. Some college
 - e. College degree
 - f. Some graduate school
 - g. Master's Degree
 - h. Doctoral-level Degree
8. Are you right or left handed?
 - a. Right handed
 - b. Left handed
 - c. Ambidextrous
9. How sexually arousing did you find the photos in the experiment?
 - a. Extremely arousing
 - b. Arousing
 - c. Slightly arousing
 - d. Neutral
 - e. Not very arousing
 - f. Not arousing at all
 - g. Disgusting
10. Had you seen any of the photos before?
 - a. Yes
 - b. NoIf yes, where? _____
11. Did you recognize any of the people in the photos?

- a. Yes
 - b. No
- If so, who? _____

12. Please circle the letter corresponding to the description you feel best describes your sexual orientation.

- a. 0- Exclusively heterosexual with no homosexual
- b. 1- Predominantly heterosexual, only incidentally homosexual
- c. 2- Predominantly heterosexual, but more than incidentally homosexual
- d. 3- Equally heterosexual and homosexual
- e. 4- Predominantly homosexual, but more than incidentally heterosexual
- f. 5- Predominantly homosexual, only incidentally heterosexual
- g. 6- Exclusively homosexual

Appendix B: Post Experimental Questionnaire for MtF Transsexuals

1. What is your age? _____
2. What is your ethnicity? _____
3. What is your religious affiliation? _____
4. What kind of job do you do? _____
5. What is your average annual income? _____
6. What is your highest level of education?
 - a. Middle school
 - b. Some high school
 - c. High school degree
 - d. Some college
 - e. College degree
 - f. Some graduate school
 - g. Master's Degree
 - h. Doctoral-level Degree
7. Are you right or left handed?
 - a. Right handed
 - b. Left handed
 - c. Ambidextrous
8. How sexually arousing did you find the photos in the experiment?
 - a. Extremely arousing
 - b. Arousing
 - c. Slightly arousing
 - d. Neutral
 - e. Not very arousing
 - f. Not arousing at all
 - g. Disgusting
9. Had you seen any of the photos before?
 - a. Yes
 - b. No
 - c. If yes, where? _____
10. Did you recognize any of the people in the photos?
 - a. Yes
 - b. No
 - c. If so, who? _____

11. Which gender do you identify as presently?
- Male
 - Female
12. What was your biological gender at birth?
- Male
 - Female
13. I identify with the gender opposite of my biological sex at birth
- All of the time
 - Most of the time
 - Half of the time
 - Some of the time
 - Very rarely
 - Never
14. I dress as the gender opposite of my biological sex at birth
- All of the time
 - Most of the time
 - Half of the time
 - Some of the time
 - Very rarely
 - Never
15. I live as the gender opposite of my biological sex at birth
- All of the time
 - Most of the time
 - Half of the time
 - Some of the time
 - Very rarely
 - Never
16. According to the gender you identify as presently (i.e., your answer to #11), please circle the letter corresponding to the description you feel best describes your sexual orientation.
- 0- Exclusively heterosexual with no homosexual
 - 1- Predominantly heterosexual, only incidentally homosexual
 - 2- Predominantly heterosexual, but more than incidentally homosexual
 - 3- Equally heterosexual and homosexual
 - 4- Predominantly homosexual, but more than incidentally heterosexual
 - 5- Predominantly homosexual, only incidentally heterosexual
 - 6- Exclusively homosexual
17. Are you currently taking any hormones? (please circle) YES NO
- If yes, which hormones? _____
 - Since when (i.e., date you began taking hormones)? _____

18. Have you undergone any type of sex reassignment surgery? (please circle) YES
NO

a. If yes, please circle which of the following it was and what month and year you had it in

i. BREASTS ONLY _____

ii. GENITAL ONLY _____

iii. BOTH BREASTS AND GENITALS _____

b. If no, do you plan to undergo sex reassignment surgery? (please circle)
YES NO

19. Have you had any other type of surgery (e.g., cosmetic surgery) to facilitate transition? (please circle) YES NO

a. If yes, please describe the type of surgery you had _____

Appendix C: Core Autogynephilia Scale (Blanchard, 1989b)

1. Have you ever become sexually aroused while picturing yourself having a *nude* female body or with certain features of the nude female form?
 - a. Yes
 - b. No

Items 2-6: If you answered "yes" above, which of the following statements were also true? [Otherwise proceed to items 7 and 8]

2. You became sexually aroused while picturing your nude female breasts.
 - a. Yes
 - b. No
 - c. Never pictured yourself with nude female breasts.
3. You became sexually aroused while picturing your nude female buttocks.
 - a. Yes
 - b. No
 - c. Never pictured yourself with nude female buttocks.
4. You became sexually aroused while picturing your nude female legs.
 - a. Yes
 - b. No
 - c. Never pictured yourself with nude female legs.
5. You became sexually aroused while picturing your nude female genitals (private parts).
 - a. Yes
 - b. No
 - c. Never pictured yourself with nude female genitals.
6. You became sexually aroused while picturing your female face.
 - a. Yes
 - b. No
 - c. Never pictured yourself with female face.
7. Which of the following pictures of yourself has been most strongly associated with sexual arousal?
 - a. As a nude women
 - b. As a woman dressed only in underwear, sleepwear, or foundation garments (for example, a corset)
 - c. As a fully clothed woman
 - d. Have never become sexually aroused while picturing yourself as a woman
 - e. Have never pictured yourself as a woman
8. Have you ever been sexually aroused by the thought of being a woman?
 - a. Yes
 - b. No

Appendix D: Test of Autogynephilia (Bailey, 2003)

Instructions for interviewer: Orally administer each item to interviewee. Circle the number next to the item only if the participant answers "yes," or as per item instruction. Tally score continuously until you reach either +10, which indicates autogynephilia, or -10, which indicates homosexual transsexualism.

- +10 At least three times, have you become sexually aroused enough when wearing women's clothing in private that you masturbated?
- +10 Have you been married to, and had biological children with, a woman?
- +9 Have you been married to a woman, without children?
- +10 If I had observed your childhood behavior, would you have appeared about as masculine as other boys?
- +10 Are you nearly as attracted to women as to men? Or more attracted to women? Or equally uninterested in both? (If "yes" to any of these)
- +9 Is your sexual preference (to men, women, both, or neither) difficult for you to decide?
- +9 Were you over the age of 40 when you began to live full time as a woman?
- +9 Were you a virgin (no oral, vaginal or anal sex with another person) until after the age of 20?
- +7 Do you refer to yourself as "transgendered?"
- +6 Have you often felt envious when looking at sexy women?
- +10 Have you ever been in the military or worked as a policeman, truck driver, or something equally stereotypically masculine? (use your judgment)
- +9 Have you worked at any of the following occupations: computer programmer, businessman, lawyer, scientist, engineer, or physician?
- 8 (If the previous two questions are answered "no") Have you ever worked as a hairstylist, beautician, female impersonator, lingerie model, or prostitute?
- 9 Does this describe you? "I find the idea of having sex with men very sexually exciting, and the idea of having sex with women not at all appealing."
- +9 (If the answer to the previous question is "no")
- 8 Is your ideal sex partner a straight man?
- +8 (If the answer to the previous question is "no")
- 9 Have you had sex with many men and no women (or only one woman to see what it was like)?
- 7 Would you like to look at pictures of really muscular men with their shirts off?
- +5 (If the answer to the previous question is "no")
- 8 Were you under the age of 25 when you began living full time as a woman?
- 8 If you saw an elegantly dressed and sexy woman on one sidewalk, and a muscular, naked man on another, which would you look at? (Man)

- +8 (If the answer to the previous question was "woman")
- 7 If you could spend only one hour with a very attractive man, which would you like to do more: dance with him or suck his penis? (Penis)
- +5 (If the answer to the previous question is "dance")

Questions for interviewer:

- 8 If you didn't already know that the person was transsexual, would you have never suspected that she was not a natural-born woman?
- +9 (If the person has been on hormones for at least 6 months) Do you find it difficult to imagine that this person could ever pass as a woman?
- 6 Would some of your male friends find this person sexy?
- 3 (Male Interviewers) Is this person flirting with you?
- +8 (Female Interviewers) Is this person flirting with you?

Appendix E: IRB Approval



**Social/Behavioral IRB – Full Board Review
Approval Notice**

NOTICE TO ALL RESEARCHERS:

Please be aware that a protocol violation (e.g., failure to submit a modification for any change) of an IRB approved protocol may result in mandatory remedial education, additional audits, re-consenting subjects, researcher probation suspension of any research protocol at issue, suspension of additional existing research protocols, invalidation of all research conducted under the research protocol at issue, and further appropriate consequences as determined by the IRB and the Institutional Officer.

DATE: November 6, 2009
TO: **Dr. Marta Meana**, Psychology
FROM: Office for the Protection of Research Subjects
RE: Notification of IRB Action
Protocol Title: **Visual Attention to Erotic Stimuli in MtF Transsexuals**
Protocol #: 0907-3160M

This memorandum is notification that the project referenced above has been reviewed by the UNLV Social/Behavioral Institutional Review Board (IRB) as indicated in Federal regulatory statutes 45CFR46. The protocol has been reviewed and approved.

The protocol is approved for a period of one year from the date of IRB approval. The expiration date of this protocol is August 12, 2010. Work on the project may begin as soon as you receive written notification from the Office for the Protection of Research Subjects (OPRS).

PLEASE NOTE:

Attached to this approval notice is the **official Informed Consent/Assent (IC/IA) Form** for this study. The IC/IA contains an official approval stamp. Only copies of this official IC/IA form may be used when obtaining consent. Please keep the original for your records.

Should there be *any* change to the protocol, it will be necessary to submit a **Modification Form** through OPRS. No changes may be made to the existing protocol until modifications have been approved by the IRB.

Should the use of human subjects described in this protocol continue beyond August 12, 2010, it would be necessary to submit a **Continuing Review Request Form** *60 days* before the expiration date.

If you have questions or require any assistance, please contact the Office for the Protection of Research Subjects at OPRSHumanSubjects@unlv.edu or call 895-2794.

Office for the Protection of Research Subjects
4505 Maryland Parkway • Box 451047 • Las Vegas, Nevada 89154-1047
(702) 895-2794 • FAX: (702) 895-0805

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