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Gender-specific genital and subjective sexual arousal to prepotent sexual features in heterosexual women and men

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ABSTRACT

Heterosexual women respond genitally to stimuli featuring both their preferred and nonpreferred genders, whereas men's genital responses are gender-specific, suggesting that gender cues are less relevant to women's sexual response. Instead, prepotent sexual features (exposed and sexually aroused genitals), ubiquitous in audiovisual sexual stimuli, may elicit automatic genital responses, thereby leading to a nonspecific sexual arousal pattern in women. To examine the role of stimulus potency in women's sexual response, we assessed heterosexual women's and men's genital and subjective sexual arousal to slideshows of prepotent stimuli (erect penises and aroused vulvas), non-prepotent stimuli (flaccid penises and female pubic triangles), and sexually neutral stimuli. Contrary to our hypotheses, both women and men demonstrated gender-specific genital and subjective sexual arousal, such that sexual arousal was greatest to prepotent male and female stimuli, respectively. This is the first study to demonstrate gender-specific genital responding in heterosexual women.

1. Introduction

Research on sexual response has demonstrated that men show a *gender-specific* sexual response pattern, wherein men's pattern of sexual response to gender features is congruent with their stated sexual orientation, that is, their sexual attraction to women and/or men (Chivers, 2010; Chivers & Bailey, 2005; Chivers, Rieger, Latty, & Bailey, 2004; Chivers, Seto, & Blanchard, 2007; Sakheim, Barlow, Beck, & Abrahamson, 1985). In contrast, heterosexual women's genital sexual response is gender-nonspecific, with similar genital sexual arousal to stimuli featuring their preferred and non-preferred gender (Chivers, 2010; Chivers & Bailey, 2005; Chivers et al., 2004, 2007; Peterson, Janssen, & Laan, 2010), whereas their self-reported (subjective) sexual arousal is somewhat gender-specific because they typically report significantly greater sexual arousal to their preferred gender. Studies experimentally varying the intensity of sexual activity (Chivers et al., 2007), stimulus modality (e.g., recorded narratives; Chivers & Timmers, 2012), types of sexual activities (Chivers, Roy, Grimbos, Cantor, & Seto, 2013), and relationship contexts (Chivers & Timmers, 2012) in sexual stimuli all report gender-nonspecific genital responses among heterosexual women, ruling out these stimulus features as moderators of gender-specific responding. This pattern of responding is also not moderated by menstrual cycle phase (Bossio, Suschinsky, Puts, & Chivers, 2013). It remains unclear why heterosexual women demonstrate a gender-nonspecific pattern of genital response whereas men show a gender-specific pattern.

1.1. Gender-specific sexual response and stimulus competence

Differing patterns of sexual response to gendered sexual stimuli suggest the features that render a sexual stimulus capable of generating a sexual response – that is, render it *sexually competent* (Both, Everaerd, & Laan, 2007; Janssen, Everaerd, Spiering, & Janssen, 2000; Spiering, Everaerd, & Laan, 2004; Spiering, Everaerd, Karsdorp, Both, & Brauer, 2006) may differ for men and women. Chivers and colleagues (2007) proposed that gender cues alone are not sufficient for stimulus competence among heterosexual women, but that other stimulus cues, such as the intensity of the depicted sexual activity, might be more relevant to sexual response. To test this hypothesis, Chivers and colleagues (2007) examined gynephilic (sexually attracted to women) and

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androphilic (sexually attracted to men) men's and women's sexual responses to stimuli that varied by level of sexual activity (none, masturbation, and coupled sex) and gender (male and female). For androphilic (heterosexual) women, sexual activity was a stronger determinant of sexual arousal than gender cues (Chivers et al., 2007) for both genital and subjective sexual arousal.

An unexpected finding emerged in Chivers and colleagues (2007) study that suggested stimulus cues other than sexual activity were relevant to women's sexual responses; androphilic women showed significantly greater genital response to films of nude women exercising than to neutral stimuli (landscapes), whereas their responses to nude men exercising were no different than to the neutral stimuli. This finding was counterintuitive because no sexual activity was presented in either films and, if anything, heterosexual women might be expected to respond to nude men but not nude women. Chivers and colleagues (2007) proposed that the female exercise video may have contained an unforeseen sexual confound: During their exercise routine, the nude women spread their legs and exposed their vulvas – a rare sight outside of sexual contexts – whereas the nude exercising men displayed flaccid penises, a more common sight in either sexual or non-sexual contexts. An exposed vulva may, therefore, be a sexually competent stimulus, whereas a flaccid penis is not. It follows that seeing the female pubic triangle (no exposed vulva) is not a sexually competent stimulus, whereas an erect penis is. The current study examined whether the presence of sexually aroused genitals – exposed, engorged vulva or erect penis – are prepotent stimuli and could explain heterosexual women's nonspecific genital sexual arousal in past studies.

1.2. Prepotent sexual stimuli

The idea that certain stimulus features within our environment are more salient than others is not new (Allport, 1925; Kuo, 1929; Tolman, 1928). A prepotent stimulus automatically elicits a specific pattern of nervous system activity (Lang, Rice, & Sternbach, 1972) and implies a biological preparedness to respond to stimuli that contributes to their emotional salience (Öhman, 1993). A prepotent sexual stimulus is therefore one that automatically initiates sexual responses. According to the information processing model of sexual arousal (Janssen et al., 2000), sexual stimuli trigger a cascade of physiological and cognitive processes, leading to a sexual response. Appraisal, the mechanism by which stimulus salience and meaning is extracted, begins at a preconscious level of awareness when salient stimulus features are automatically detected (Janssen et al., 2000). This model suggests that sexual stimuli possess features that elicit a specific pattern of central and peripheral nervous system activity (Geer, Lapour, & Jackson, 1993; Ponseti et al., 2006). For women, peripheral genital responses (e.g., vaginal vasocongestion) increase within seconds of the onset of a visual sexual stimulus, even for stimuli that do not evoke any subjective sexual arousal (e.g., mating bonobos, Chivers & Bailey, 2005), suggesting certain stimulus cues are rapidly processed and lead to an automatic genital response (Chivers, 2005; Van Lunsen & Laan, 2004). Ponseti and colleagues (2006) proposed that sexually- aroused genitals – exposed and aroused vulvas and erect penises – serve as prepotent sexual features that are automatically detected and trigger sexual responding. Supporting this assertion, this team subsequently demonstrated that subliminally priming heterosexual women with images of erect penises and exposed and aroused vulvas, versus nonsexual images, augmented genital response to a subsequent erotic film clip (Ponseti & Bosinski, 2010).

The results from Chivers and colleagues (2007), that heterosexual women responded genitally to exposed vulvas but not flaccid penises, suggests that sexual stimulus prepotency is composed of at least two components: sexual readiness, as depicted by sexually aroused genitals (erect penis, exposed and engorged vulva); and the gender/sex of the individual, depicted (male or female genitals). If this is correct, then the stimuli used in the Chivers and colleagues' (2007) study were not equivalent in terms of stimulus prepotency because the female stimuli displayed cues of sexual readiness (exposed vulvas) whereas the male stimuli did not (flaccid penis). It is therefore possible that women have gender-nonspecific genital responses to audiovisual sexual stimuli because prepotent sexual features (exposed and aroused genitals) are depicted in almost all of the sexual stimuli used in studies examining gender-specificity (e.g., Chivers, 2010; Chivers & Bailey, 2005; Chivers et al., 2004, 2007; Peterson et al., 2010; Steinman, Wincze, Sakheim, Barlow, & Mavissakalian, 1981; Wincze & Qualls, 1984).

1.3. Current study

The current study was designed to examine the relative contributions of prepotent sexual features and gender features to stimulus competence, or the capacity to generate a sexual response, among heterosexual women and men. We measured women's and men's genital and subjective sexual arousal to visual stimuli varying in prepotency and gender. We predicted that women would show higher levels of genital responding to sexual stimuli showing sexually aroused genitals than to non-aroused genitals, regardless of the gender of the genitals depicted in sexual stimuli. Given the large body of research showing androphilic women's genital arousal does not differentiate between female and male sexual stimuli, we expect a gender-nonspecific pattern of genital response, with the alternative hypothesis being a gender-specific pattern. Because heterosexual women's subjective sexual arousal, unlike their genital sexual arousal, is somewhat gender-specific (Chivers, 2005; Chivers & Bailey, 2005; Chivers et al., 2007), we predicted that women would report greater sexual arousal to the male versus female stimuli, regardless of stimulus potency.

We included a sample of heterosexual men as a comparison group, and to investigate whether exposed genitals alone (an unambiguous gender cue) are sufficient to evoke a gender-specific pattern of subjective and genital sexual arousal in men. Because men consistently demonstrate a gender-specific pattern for both genital and subjective sexual arousal, we predicted that men would show their highest genital sexual arousal and report highest subjective sexual arousal to female stimuli. Given that aroused and engorged genitals are rarely seen outside of a sexual context, we predicted that men's sexual responses would also vary by level of stimulus prepotency, such that men would show higher levels of genital responding and report higher subjective sexual arousal to stimuli showing sexually aroused genitals than to non-aroused genitals.

2. Methods

2.1. Participants

Heterosexual women and men between the ages of 18 and 40 years old were recruited from Queen's University, a local college, and the surrounding community via posters and Internet advertisements. The inclusion criteria were: no history or current problems with sexual functioning; no history of mental illness or substance abuse; not using any forms of medication known to affect sexual functioning such as anti-depressants; no active sexually transmitted infection; no pregnancy at the time of testing. Participants had to speak, read, and write English fluently; have normal or corrected vision; and (for women) have experienced vaginal penetration in some form, and have regular menstrual cycles (27–33 days long; Chiazze, Brayer, MacIsco, Parker, & Duffy, 1968). For our female sample, hormonal contraceptive use was permitted. Participants reported their sexual identity and completed the Kinsey Sexual Attraction Scale (KSAS; Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953). Only women and men who had exclusive or predominantly other-gender attractions on the Kinsey Sexual Attraction Scale (KSAS; Kinsey et al., 1948, 1953), were included in the data analysis (for women, $M = 6.44$, $SD = .50$, and for men, $M = .14$, $SD = .36$ where a score of 7 reflects "men only" and 0 reflects "women only").