



Desynchrony Between Subjective and Genital Sexual Arousal in Women: Theoretically Interesting but Clinically Irrelevant

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Due in part to Chivers and colleagues' [1] comprehensive meta-analysis on the topic, a great deal of attention has been paid to the relationship between genital and subjective sexual arousal. The Chivers et al. paper analyzed the results of laboratory studies that quantified levels of concordance, or the relative agreement between genital and subjective arousal, in both men and women. One of the major findings was a striking gender difference; the agreement between these two types of arousal is much higher in men ($r = .66$) than in women ($r = .26$).

To understand the nuances of this gender difference, it is important to address the ways in which arousal and concordance are measured. Genital sexual arousal in the laboratory is most often assessed with a vaginal photoplethysmograph [2], which is an acrylic, tampon-shaped device that contains a light source and a photosensitive light detector. When the device is inserted in the vagina, the amount of back-scattered light directly relates to the transparency of engorged and unengorged vaginal tissue and therefore serves as an indirect index of vasocongestion [3]. Subjective sexual arousal is typically measured using a Likert-style, self-report questionnaire that asks a woman to report her level of mental arousal and/or the degree to which she feels "turned on." Researchers typically present a series of short videos—a non-sexual film (e.g., a travel film, nature documentary) followed by an erotic film—and ask participants to retrospectively report on their subjective arousal after the end of the erotic film. Traditionally, concordance between genital and subjective arousal has been assessed through correlations. Continuous genital arousal data is collapsed or averaged and compared to discrete, self-reported subjective arousal.

Researchers have attempted to explain the gender difference in concordance in various ways. Low correlations between subjective and genital measures of arousal in women may be the result of negative affect that is induced when male-produced erotica is used as sexual stimuli. If "man-made" films are not associated with negative mood states among men, then these films could be responsible for the gender difference. However, the meta-analysis revealed that female-centered stimuli did not increase the agreement between subjective and genital arousal in women.

The gender difference could also be driven by anatomy. A penile erection is apparent, and it provides much more direct feedback than does vaginal vasocongestion. Throughout childhood and adolescence, the strength of an erection as an arousal cue may reinforce the importance of the genitals in men's assessments of their subjective arousal. For this reason, it may be easier for men than for women to attend to their genital cues. Although male attention to genital cues can be explained anatomically, their attendance to bodily changes may not be sexuality-specific. Men are also more accurate than women at detecting other physiological changes, such as differences in blood pressure, heart rate, and temperature [4]. However, this does not mean that women are incapable of attending to their genital cues. Women do exhibit a significant degree of agreement between VPA and their subjective arousal when they are *directed* to focus on their genitals. When women were told to monitor either their genital changes or their overall physiological changes, they had higher levels of concordance than women who were given no attentional cues [5]. A separate study in which sexually functional women were asked to continuously rate their genital sensations during an erotic film revealed that correlations between subjective and genital arousal were particularly high for women with greater interoceptive awareness (i.e., women who were more likely to focus on internal cues) [6]. Women with arousal concerns also show a significant relationship between their perceived and actual genital arousal when instructed to attend to genital cues [7]. Concordance levels for women who are

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more attentive to their internal cues and sensations may be similar to rates of concordance in men.

Studies that compare the relationship between genital and subjective arousal using continuous methodologies highlight the variability between women in the degree to which genital cues play a role in subjective sexual arousal. As noted earlier, subjective sexual arousal is most commonly assessed using a self-report Likert scale at the end of an erotic film sequence, and this necessitates analyzing the relationship with genital measures using correlational analyses. As correlations average across data, individual patterns of responding are obscured. When subjective arousal is measured continuously throughout the film sequence (as is done with genital arousal), individual women's response patterns can be analyzed using more sophisticated statistical analyses (e.g., hierarchical linear modeling; HLM). Studies that have used this methodology and HLM demonstrate that for some women, how mentally turned on they are corresponds extremely well with how their genitals are responding. Looking at their pattern of responses across time, one can clearly see that for every standardized unit of increase in genital arousal, there is a corresponding unit of increase in subjective sexual arousal. But, other women experience increases and decreases in subjective arousal throughout the erotic film presentation that are completely unrelated to how their genitals are responding [8]. Moreover, the degree to which women's subjective and genital arousal are related is independent of their level of genital arousal or whether or not they report difficulties becoming sexually aroused [8]. It is evident then that, for some women, genital sensations play an important role in their subjective experience of feeling "turned on." But for other women, factors such as contextual cues, relationship issues, body image, and past sexual history may be more meaningfully related to their subjective experience of sexual arousal than their genital sensations.

The fact that levels of concordance in the laboratory are higher in men than in women is theoretically interesting in that it may be representative of an underlying gender difference, but the difference may not be clinically relevant. It has been assumed that, because correlations between female genital and subjective arousal are low, women are disconnected from their genitals. More importantly, it has also been assumed that this lack of synchrony needs to be remedied. Several recent studies that aimed to improve sexual function in both clinical and non-clinical populations have used concordance as an outcome measure [9–11]. For example, Brotto and colleagues [9] demonstrated that mindfulness-based sex therapy improves genital-subjective arousal concordance among women with desire and/or arousal concerns. The authors note that current treatments for sexual dysfunction do not focus on skills that could enhance concordance, and they suggest that concordance "may

be a key component to healthy sexual arousal in women." Though this may be the case, it is not yet clear that higher levels of concordance are associated with greater sexual well-being. Although a few studies have documented a relationship between higher concordance and greater orgasm frequency [12, 13], little to no research has demonstrated an association among increased concordance, sexual satisfaction, and other important domains of female sexual function.

Given the variability in relationship between genital and subjective arousal and the lack of evidence linking concordance to sexual well-being, perhaps we should target other factors that are associated with subjective arousal. Context is one such factor. In a series of focus groups, women were asked to describe their cues to arousal; relationship context (i.e., committed vs. casual relationship) and situational variables related to the partner significantly contributed to their arousal experiences [14]. Similarly, when women were asked to write about their arousal experiences in a separate study, a linguistic analysis of their responses identified seven core themes, one of which was context (the others included foreplay, autonomic arousal, physical/mental arousal, fantasy, orgasm, and whole body) [15]. Words that loaded onto the context theme reflected aspects of the relationship as well as other partner variables (e.g., "age," "love," "time"). Although physiological changes may contribute to subjective excitement, it is clear that there are other relevant arousal cues.

Though the gender difference in concordance may be of interest to clinicians, there is no evidence to warrant considering a low correlation between genital and subjective arousal a target for clinical intervention. Rather than developing interventions that aim to increase concordance, it seems more appropriate to (a) accept the variability that exists between women and men as theoretically interesting and (b) avoid translating a theoretically interesting finding to a clinical space without careful consideration of its clinical relevance. We should no more worry about why women are less attentive to their genital responses than to contextual variables or even to other autonomic cues (e.g., heart rate, breathing rate, nipple sensitivity) that enhance their subjective arousal. Individual women value different aspects of the sexual experience; they may be "turned on" by sensing genital changes, or they may be more mentally excited by a romantic atmosphere, the smell of their partner, or a perceived increase in heart rate. As we learn more about specific cues and enhancers of subjective arousal, we can tailor individual treatments to better meet the needs of these women.

Compliance with Ethical Standards

Conflict of Interest Cindy M. Meston and Amelia M. Stanton declare no conflict of interest.

Human and Animal Rights Statement This article does not contain any studies with human or animal subjects performed by any of the authors.

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