

## ORIGINAL RESEARCH—PSYCHOLOGY

## The Relationship Between Sexual Concordance and Interoception in Anxious and Nonanxious Women

Kelly D. Suschinsky, PhD\*<sup>1</sup> and Martin L. Lalumière, PhD\*<sup>2</sup>

\*Department of Psychology, University of Lethbridge, Lethbridge, AB, Canada

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### ABSTRACT

**Introduction.** *Sexual concordance* refers to the association between physiological and self-reported sexual arousal. Women typically exhibit lower sexual concordance scores than men. There is also a sex difference in *interoception*—awareness of (nonsexual) physiological states or responses—such that women, compared with men, tend to be less aware of and less accurate at detecting changes in their physiological responses. Women with anxiety problems tend to have better interoceptive abilities than nonanxious women.

**Aim.** To investigate whether women's lower sexual concordance is associated with interoception using a sample likely to show high variation in interoceptive abilities.

**Method.** Sixteen anxious and 15 nonanxious women were presented with twelve 90 seconds sexual and nonsexual film clips while their genital response, heart rate, and respiration rate were measured. A heartbeat mental tracking task was also employed.

**Main Outcome Measures.** Genital response was measured with a vaginal photoplethysmograph. Heart rate was measured with an electrocardiogram and respiration rate with a thermistor. Participants estimated their physiological responses after each film. A mental tracking task was also used to assess participants' awareness of heart rate. Within-subject correlations were computed for each physiological/self-reported response combination.

**Results.** Overall, sexual concordance (i.e., the correlation between genital responses and perceptions of genital response) was not significantly associated with heart rate awareness or respiration rate awareness. Anxious women did not exhibit significantly higher sexual concordance or heart rate awareness than nonanxious women; the nonanxious women actually exhibited higher respiration rate awareness.

**Conclusion.** The results suggest that sexual concordance may be a distinct phenomenon from interoception and in need of its own explanation. **Suschinsky KD and Lalumière ML. The relationship between Sexual concordance and interoception in anxious and nonanxious women. J Sex Med 2014;11:942–955.**

**Key Words.** Sexual Concordance; Genital Response; Self-Reported Sexual Arousal; Interoception; Women; Awareness of Physiological States

The human sexual response is a complex process that involves physiological, emotional, and cognitive changes [1,2]. The different components of the sexual response tend to be highly correlated (or concordant) in men, but less

so in women. For instance, men's physiological (i.e., genital) and psychological experience of (i.e., self-reported) sexual arousal are typically highly correlated (Pearson's  $r = 0.66$ , based on a meta-analysis of 132 studies [3]). Women's genital response and self-reported sexual arousal are typically positively correlated, but to a significantly lesser extent than that seen in men ( $r = 0.26$  [3]). In addition to exhibiting lower sexual concordance, women also show lesser awareness of nonsexual physiological states (reviewed in [4]). The purpose of the current study is to examine the relationship

The research was conducted while both authors were affiliated with the University of Lethbridge. Please see below for current affiliations for each author.

<sup>1</sup>Department of Psychology, Queen's University, Kingston, ON, Canada

<sup>2</sup>School of Psychology, University of Ottawa, Ottawa, ON, Canada

between women's sexual concordance and awareness of other, nonsexual, physiological states.

Researchers have recently attempted to explain why women's sexual concordance is lower than men's sexual concordance. The results from Chivers et al.'s [3] meta-analysis revealed that the sex difference in sexual concordance is not accounted for by methodological factors. Specifically, stimulus characteristics (e.g., stimulus length, stimulus modality, stimulus content, and number of trials), sample characteristics (e.g., age of participants and hormonal contraceptive use in women), and analytical factors (e.g., type of correlation computed) did not significantly affect the sex difference in sexual concordance levels. Similarly, other factors, such as experience with one's genitals [3,5] and being asked to report one's perceptions of genital response instead of one's feelings of sexual arousal [3], did not influence the sex difference in sexual concordance.

Most of the research on the source of women's lower sexual concordance has focused on factors that are specific to sexual arousal research [3,6]. Suschinsky and Lalumière [4] examined the relationship between sexual concordance and interoception, or one's ability to perceive or detect physiological states. Suschinsky and Lalumière hypothesized a link between sexual concordance and interoceptive ability because in laboratory settings, men are more accurate than women are at reporting several nonsexual physiological states or responses, including heart rate [7–10], respiratory resistance [11], blood glucose levels [12], blood pressure [13], and stomach contractions [14]. In addition, there is some evidence to suggest that different forms of interoceptive awareness are positively correlated with each other ([14], but see [11]).

Suschinsky and Lalumière [4] presented men and women with a variety of short sexual and nonsexual films while their genital response, heart rate, and respiration rate were measured. After each film, participants were asked to estimate their genital response, heart rate, and respiration rate. Concordance scores were calculated for each response type by correlating the physiological response with the corresponding self-reported response (i.e., perception of genital response, heart rate, or respiration rate). Men exhibited significantly higher correlations than women for genital response and heart rate. Sexual concordance (defined as the association between genital responses and self-reported perception of genital responses) was not significantly correlated with either heart rate (Pearson's  $r = 0.16$ ) or respiration rate (Pearson's  $r = -0.14$ )

concordance (defined as the association between actual heart/respiration rate and self-reported perception of heart/respiration rate), suggesting that sex differences in sexual concordance cannot be explained by sex differences in general interoceptive ability.

Suschinsky and Lalumière's [4] study had two limitations, and it must be replicated and extended before determining that sexual concordance and interoceptive abilities are not related. First, the sample that Suschinsky and Lalumière tested was rather homogenous. Although their participants exhibited a relatively broad range of interoceptive awareness based on the heart rate and respiration rate measures, few participants showed high heart rate awareness or high respiration rate awareness. For example, only five participants produced a correlation of 0.50 or higher between their physical response (i.e., heart rate or respiration rate) and their corresponding self-reported rating of their physical response. The small number of individuals with high heart rate or respiration rate awareness may have prevented Suschinsky and Lalumière from detecting a significant correlation between sexual concordance and other forms of awareness.

The second limitation involves the procedure that Suschinsky and Lalumière [4] used to assess heart rate and respiration rate awareness. They recorded participants' heart rate and respiration rate while they watched a variety of films, and participants reported their heart rate and respiration rate after each film. Most research on heart rate perception involves no distraction, in that participants are asked to count their heartbeats during a given period of time with no concurrent stimulus [9,15]. Although Suschinsky and Lalumière found a significant sex difference in heart rate awareness, it is important to include a measure of heart rate awareness that is more consistent with typical interoception research in order to provide a better test of whether sexual concordance is associated with general interoceptive abilities.

### The Current Study

The purpose of the current study was to further explore the relationship between sexual concordance and interoceptive ability in women. We recruited women who had a high likelihood of being accurate at perceiving their heart rate, that is, women with a history of anxiety or panic: Previous research has shown that individuals with panic disorder, social phobia, generalized anxiety disorder, and specific phobia have more accurate

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