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C-Tactile Mediated Erotic Touch Perception Relates to Sexual Desire and Performance in a Gender-Specific Way

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ABSTRACT

Background: Unmyelinated low-threshold mechanoreceptors—the so-called C-tactile (CT) afferents—play a crucial role in the perception and conduction of caressing and pleasant touch sensations and significantly contribute to the concept of erotic touch perception.

Aim: To investigate the relations between sexual desire and sexual performance and the perception of touch mediated by CT afferents.

Methods: Seventy healthy participants (28 men, 42 women; mean age ± SD = 24.84 ± 4.08 years, range = 18−36 years) underwent standardized and highly controlled stroking stimulation that varied in the amount of CT fiber stimulation by changing stroking velocity (CT optimal = 1, 3 and 10 cm/s; CT suboptimal = 0.1, 0.3, and 30 cm/s). Participants rated the perceived pleasantness, eroticism, and intensity of the applied tactile stimulation on a visual analog scale, completed the Sexual Desire Inventory, and answered questions about sexual performance.

Outcomes: Ratings of perceived eroticism of touch were related to self-report levels of sexual desire and sexual performance.

Results: Pleasantness and eroticism ratings showed similar dependence on stroking velocity that aligned with the activity of CT afferents. Erotic touch perception was related to sexual desire and sexual performance in a gender-specific way. In women, differences in eroticism ratings between CT optimal and suboptimal velocities correlated positively with desire for sexual interaction. In contrast, in men, this difference correlated to a decreased frequency and longer duration of partnered sexual activities.

Clinical Implications: The present results lay the foundation for future research assessing these relations in patients with specific impairments of sexual functioning (eg, hypoactive sexual desire disorder).

Strengths and Limitations: The strength of the study is the combination of standardized neurophysiologic methods and behavioral data. A clear limitation of the study design is the exclusion of exact data on the female menstrual cycle and the recruitment of an inhomogeneous sample concerning sexual orientation.

Conclusion: The present results provide further evidence that unmyelinated CT afferents play a role in the complex mechanism of erotic touch perception. The ability to differentiate between CT optimal and suboptimal stimuli relates to sexual desire and performance in a gender-specific way. **Bendas J, Georgiadis JR, Ritschel G. C-Tactile Mediated Erotic Touch Perception Relates to Sexual Desire and Performance in a Gender-Specific Way. J Sex Med 2017;XX:XXX−XXX.**

Key Words: Touch; Erotic; Gender; C-Tactile Afferents; Sexual Performance; Sexual Desire

INTRODUCTION

Sex is a reward-directed behavior and, like other pleasures, the sexual response can be parceled into motivational and consummatory components.[1,2] Sexual desire can be conceptualized as the conscious experience of sexual motivation, although it also can be part of sexual performance. Judged from the high prevalence of sexual dysfunction associated with desire,[3,4] its occurrence is crucial for human sexual functioning. Although all senses are possible gateways to sexual desire, neurobiological scrutiny

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has focused mostly on the way visual and olfactory stimuli excite sexual motivation and desire.[1,5] For all the strong sexual feelings it can generate, the skin as a proximal gateway to sexual desire has received surprisingly little attention in the scientific literature. Yet, the ability to perceive interpersonal touch as sexually stimulating and pleasurable could be a key component of sexual behavior. Unsurprisingly, a symbiosis between the amount of tactile physical affection and relationship satisfaction and attachment bonds has been reported.[6]

Human-to-human touch is conducted by different peripheral sensory nerve fibers of varying degrees of myelination. A particular class of unmyelinated (C class) sensory fibers, acting as mechanoreceptors (C low-threshold mechanoreceptors), has received much attention in recent decades, being verified as a fundamental element in the conduction of affective interpersonal touch.[7–10] The so-called C-tactile (CT) fibers also have been associated with body perception[11] and social well-being.[9,12] These and other observations led to the "CT social touch hypothesis"[13] suggesting that CT afferents are of crucial importance as a mediator in interpersonal touch. CT fibers have been recorded from human skin with exception of glabrous skin (eg, the lip vermilion, soles of the feet, and palms of the hands).[14] However, it is still unknown whether the genital area—covered by glabrous and hairy skin—contains CT fibers.

Previous studies have determined the explicit properties of CT fibers: microneurographic tests, which directly derive electric signals from the small fibers, have shown that the firing rates of the CT afferents are at their highest when roused by a stimulus with a temperature of approximately 32°C[15] and a velocity of 1 to 10 cm/s.[7,14,16] In the brain, key areas for CT-mediated touch processing are the posterior insular cortex,[10] the orbitofrontal cortex,[17,18] and the anterior cingulate cortex.[19,20] This suggests that CT afferent information has direct access to the brain's emotional and reward system.

In a classic neuroscience textbook, CT afferents were suggested to be involved in the conduction of sexually stimulating or arousing touch.[21] This hypothesis was recently confirmed in a psychophysical experiment.[22] CT optimal stroking frequencies for reported eroticism range from 1 to 10 cm/s, very similar to those of reported pleasantness ratings in previous experiments.[7,23–25] Furthermore, although the presence of CT afferents in the genital area has yet to be established, it has been shown that erotic genital touch[26,27] and genital engorgement[28,29] activate an area in the posterior insula where putative CT sensations are processed.

We examined potential coherences between CT-mediated perception of erotic touch stimuli and individual sexual desire and performance profiles as inferred from questionnaires in a sample of healthy young men and women. CT optimal and suboptimal stroking on the left forearm took place under the same conditions as in previous psychophysical studies.[7,23–25] The two-point discrimination threshold was included as a measurement of the discriminative aspects of the sense of touch, which are most likely conducted by myelinated Aβ-fibers.[30]

Because CT-mediated touch is experienced as rewarding and related to the perception of eroticism, we investigated whether an individual high perceptibility of CT-targeted touch facilitates positive sexual experiences. Therefore, we hypothesized that ratings of CT-specific stroking, but not discriminative touch perception, would correlate positively to sexual desire and sexual performance.

AIM

The relation between CT-mediated touch perception and subjective measurements of sexual desire and sexual performance was investigated.

MAIN OUTCOME MEASURES

Ratings of perceived eroticism of tactile stroking stimuli (overall eroticism), CT-specific stroking (erotic touch differentiation), and two-point discrimination obtained in a laboratory environment were related to self-report data on sexual desire (interactional subscale of Sexual Desire Inventory [SDI]) and sexual performance (duration and frequency of partnered sexual activities, perceived pleasantness of sexual activities, and orgasm frequency in women).

METHODS

Ethical Declaration

The study design was conducted according to the Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects and approved by the ethics committee of Dresden University of Technology.

All participants signed an informed consent and received a small financial compensation.

Participants

Participants were recruited by postings at the local university buildings and the university website. Fluency in the German language for comprehension of instructions and questionnaires as well as subjective health were required. All participants stated that they had a normal sense of touch and normal or corrected-to-normal vision. This was assessed before inclusion in the study. To decrease potential participation bias, participants were not specifically asked about their sexual health before the investigations.

Eighty volunteers participated in the study. Eight were excluded because of mental health issues (based on their questionnaire scores) or reports of experienced sexual violence (all women). Another two participants (one man and one woman) were excluded from the analysis because they stated no sexual activity.

Hence, the final sample was composed of 70 healthy volunteers (42 women, 28 men) 18 to 36 years old (mean age ± SD = 24.84 ± 4.08 years) and most were students.