

ORIGINAL RESEARCH—ANATOMY/PHYSIOLOGY

Greater Tactile Sensitivity and Less Use of Immature Psychological Defense Mechanisms Predict Women's Penile-Vaginal Intercourse Orgasm

Stuart Brody, PhD,* Stephanie Houde, BA,[†] and Ursula Hess, PhD[‡]

*School of Social Sciences, University of the West of Scotland, Paisley, UK; [†]Department of Psychology, University of Quebec at Montreal, Montreal, Quebec, Canada; [‡]Department of Psychology, Humboldt University Berlin, Berlin, Germany

DOI: 10.1111/j.1743-6109.2010.01917.x

ABSTRACT

Introduction. Previous research has suggested that diminished tactile sensitivity might be associated with reduced sexual activity and function. Research has also demonstrated significant physiological and psychological differences between sexual behaviors, including immature psychological defense mechanisms (associated with various psychopathologies) impairing specifically women's orgasm from penile-vaginal intercourse (PVI).

Aims. To examine the extent to which orgasm triggered by PVI (distinguished from other sexual activities) is associated with both greater tactile sensitivity and lesser use of immature psychological defenses.

Methods. Seventy French-Canadian female university students (aged 18–30) had their finger sensitivity measured with von Frey type microfilaments, completed the Defense Style Questionnaire and a short form of the Marlowe-Crowne social desirability scale, and provided details of the 1 month (and ever) frequencies of engaging in, and having an orgasm from, PVI, masturbation, anal intercourse, partner masturbation, and cunnilingus.

Main Outcome Measures. Logistic and linear regression prediction of orgasm triggered by PVI from tactile sensitivity, age, social desirability responding, and immature psychological defenses.

Results. Having a PVI orgasm in the past month was associated with greater tactile sensitivity (odds ratio = 4.0 for each filament point) and less use of immature defense mechanisms (odds ratio = 5.1 for each scale point). Lifetime PVI orgasm was associated only with less use of immature defense mechanisms (and lower social desirability responding score). Orgasms triggered by other activities were not associated with either tactile sensitivity or immature defense mechanisms. Tactile sensitivity was also associated with greater past month PVI frequency (inclusion of PVI frequency in a logistic regression model displaced tactile sensitivity), and lesser use of immature defenses was associated with greater past month PVI and PVI orgasm frequencies.

Conclusions. Both diminished physical sensitivity and the presence of specific psychological impairments might decrease the likelihood of women's orgasm from specifically PVI, but not other sexual activities. **Brody S, Houde S, and Hess U. Greater tactile sensitivity and less use of immature psychological defense mechanisms predict women's penile-vaginal intercourse orgasm. J Sex Med 2010;7:3057–3065.**

Key Words. Orgasm; Tactile Sensitivity; Sexual Intercourse; Masturbation; Psychological Immaturity

Introduction

One factor that can influence sexual function and dysfunction is the ability to feel sexual sensations. Greater reinforcement value increases the likelihood of repeating a behavior, hence

greater reward from a specific sexual behavior should increase the likelihood of its repetition [1]. Due to evolutionary pressures, the one potentially reproductive sexual behavior per se should be most rewarding—if not, this in itself would be a symptom of impairment [2,3].

Nondiabetic women with low scores on the Female Sexual Function Index (suggestive of sexual dysfunction) compared with women with higher scores, were more likely to have both abnormally high vibratory toenail sensory thresholds and abnormal autonomic test results (heart rate variation during deep breathing and squatting vagal tests) [4]. Women with sexual arousal disorder had higher finger tactile thresholds than controls [5]. Among women with depressed mood who consumed fluoxetine (but not an unmedicated group), an inverse association of finger sensory threshold with both vaginal lubrication and sexual desire was found [6]. In a sample of healthy Dutch female university students, greater finger tactile sensitivity was associated with higher frequencies of penile-vaginal intercourse (PVI), partner masturbation, and cunnilingus, but not solitary masturbation. Past month orgasmic rates were uncorrelated with finger sensitivity [1].

Men's premature ejaculation, like women's coital anorgasmia or vaginal anorgasmia, is another impairment that is most salient during PVI but not as clearly so during other sexual activities [7]. In a nonclinical sample, vibrotactile finger threshold correlated 0.40 with erect penis threshold, and -0.57 with 4-week PVI frequency [8]. By contrast, lifelong premature ejaculation patients showed significantly higher sensory thresholds of the finger but similar penile thresholds for warm sensation, compared with controls. They also had higher vibratory sensation thresholds of the finger and penis, compared with controls [9]. Thus, rather than being more sensitive, individuals with this sexual impairment were less sensitive. The investigators suggested that the patients "may suffer from a central altered perception of the afferent inputs deriving from the periphery, which ultimately results in an inadequate interpretation and subsequent elaboration of the sensory inputs themselves" [9]. However, the literature on premature ejaculation and penile sensitivity is mixed, with some studies finding no relationship with vibrotactile thresholds [10]. One study showed no association of penile vibrotactile threshold with premature ejaculation, but did find that men with erectile dysfunction (or combined erectile dysfunction and premature ejaculation) had higher thresholds [11].

Some evidence suggests a developmental process in which aversive experiences lead to a functional down-regulation of global tactile sensitivity (with implications for psychosexual development) [1]. Withdrawal of affectionate parental tactile stimulation has also been noted in some

clinical cases of children engaging in "excessive" masturbation, and the restoration of affectionate parental tactile stimulation reduced the masturbation [12,13].

Diminished perception of some types of afferent inputs can be the result of a variety of factors, including peripheral receptor sensitivity per se, as well as peripheral conduction and central processing. Central processing is susceptible to lack of attention to stimuli. Just as the sensory threshold for pain is inversely associated with psychological characteristics of "concern about pain" and "worry about illness" [14], so too might readiness for perceiving pleasurable sexual sensations differ as a function of psychological characteristics. Indeed, greater mental attention to vaginal sensations during PVI is an important predictor of vaginal orgasm [15].

In addition to simple tactile threshold, specific psychosexual problems impair specific aspects of sexual activity and orgasmic response. A comprehensive review of the association of various sexual activities with physical and mental health measures and related processes revealed that specifically PVI and the orgasm that it directly produces, are associated with indices of better physical and mental health [2], but other sexual activities are not, or even have inverse associations with health measures. In this context, immature psychological defense mechanisms are relevant. Immature psychological defenses reduce acute distress caused by emotional conflict, but do so by impairing accurate perception of reality. Immature defenses are associated with various psychopathologies, poorer ability to relate intimately to the opposite sex [3,16], and are able to distinguish not only patients from controls, but also differentiate between some psychiatric diagnoses [17]. In studies of Portuguese and British women, immature defenses were associated with lower likelihood of specifically vaginal orgasm [3,18]. These studies provided empirical tests of Freud's hypotheses [19,20] regarding female psychosexual development and vaginal orgasm: it was to be expected that failure to attain more mature psychosexual function would result in impairments of orgasmic response to the most adult genital sexual activity (the one with evolutionary relevance), rather than impairing response to sexual behaviors involving substitution of the genitals of one sex with something other than the genitals of the other sex. The immature defenses measured in these and the present study are: "autistic fantasy (excessive daydreaming as a substitute for human relationships, more effective

action, or problem solving), displacement (transfer of a feeling about a given object onto a substitute object that is usually less psychologically threatening), splitting (lack of integration of negative and positive qualities of self or others, often resulting in intense unstable valuations), denial (refusal to acknowledge painful aspects of external reality or inner experience), isolation of affect (disconnection of emotions originally associated with a specific experience while remaining aware of the cognitive elements), dissociation (disconnection of usually integrated psychological functions, such as consciousness, memory, perception, or sensorimotor behavior), projection (attribution to another of one's unacceptable impulses), devaluation (exaggeration of negative qualities in self or others), somatization (the conversion of psychological suffering into physical symptoms)" [18] (p. 776), rationalization (hiding true motivations and offering reassuring but false explanations), passive-aggression (expressing aggression toward others indirectly or passively, including using procrastination), and acting out (emotional conflict leads to often impulsive behavioral manifestations of an unconscious impulse without conscious awareness of the emotion) [21]. Although originally developed as a psychoanalytic concept, immature defenses may be understood as a range of maladaptive implicit processes that mediate reactions to inner and outer psychological conflicts. Defense mechanisms are a qualitative aspect of diagnosis in the (nonpsychoanalytic) Diagnostic and Statistical Manual of the American Psychiatric Association, 4th edition [21].

PVI can involve some degree of incidental direct and indirect clitoral stimulation [22]. Importantly however, vaginal and cervical stimulation additionally involve peripheral afferents not activated by clitoral stimulation, including the vagus nerve [2,12,23], which have important roles in pair-bonding. Thus, even with a completely severed spinal cord (which precludes clitoral connection with the brain), women are able to orgasm from vaginal-cervical stimulation (verifiable by self-report and brain imaging), via the vagus [23]. In addition to anatomic differences, there are important psychosexual and interpersonal differences between orgasm from PVI and from either clitorally focused activity or from adding clitoral masturbation to PVI. These differences are consistently in the direction of women's pure PVI orgasm being associated with better intimate relationship satisfaction [24–26], greater mental health satisfaction [24], less use of

immature defenses [3,18], greater concordance of genital and subjective arousal [27,28], less risk of female sexual arousal disorder [29], and less risk of functional musculoskeletal disturbance [30], among other indices of better psychological function [2,31].

Brody et al. [1] may have not detected an association of tactile sensitivity with orgasmic response because of the univariate research model employed. Sexual functioning is likely to be multifactorial, so multivariate examination of the determinants of sexual function might be more informative than a univariate approach. Even if one has generally good tactile sensitivity, psychosexual problems manifesting as immature defenses such as dissociation or isolation of affect could disrupt specifically PVI orgasm.

In the present research, finger tactile threshold was employed as a measure of general tactile sensitivity. This measure has been validated in several sexual and nonsexual studies [1,4–6,9,32–34]. Finger threshold further has the advantage over genital threshold measurements of being fairly straightforward to measure and not risking discomforting (or risking dropout of) nonclinical participants.

It was hypothesized that in multivariate analysis, orgasm triggered by PVI (but not other orgasm triggers) would be associated with women's greater finger tactile sensitivity and lesser use of immature psychological defense mechanisms (total immature defenses score). The possible confounding effects of social desirability bias responding [2,35] and age are also considered. In addition, the role of greater PVI frequency will be considered, as it not only increases opportunities for PVI orgasm, but may be an indicator of the reinforcement value of PVI (with which tactile sensitivity should be associated [1]).

Materials and Methods

The study was conducted in accordance with the principles of the Helsinki Declaration, and approved by the University of Quebec at Montreal Institutional Review Board. All participants gave written consent, and were made aware of their right to discontinue participation at any time.

Female students were recruited from postings at the University of Quebec at Montreal in the year 2009. Inclusion criteria were age 18–30 and self-reported good health. Sample size was based on the previously observed effect size for immature

defenses inverse association with vaginal orgasm [3] (power = 0.80, alpha = 0.05, sample size \geq 55).

A female experimenter applied Von-Frey-type microfilaments (Stoelting; Wood Dale, IL, USA) sizes 1.65, 2.36, 2.44, 2.83, 3.22, 3.61, and 3.84 (sizes are = \log_{10} [$10 \times$ force in mg]), while participants closed their eyes. Filaments were applied in random sequence to the right middle finger (plantar surface of the middle phalanx). Each filament was applied thrice. At each application, the experimenter counted to three and as per a randomized schedule, applied the filament on one of the counts. The participant was then asked on which count the filament was applied. Threshold was defined as the lowest pressure filament that the participant correctly reported the application count for all three trials (if a participant failed to correctly report the application count for all three trials of the greatest size of 3.84, a value of 4.00 was assigned; this was the case for six participants). The microfilament manufacturer advises filament 3.61 to be the upper limit of normal sensitivity, with higher values indicative of at least “diminished light touch” [34].

Participants completed a questionnaire on details (days in past 30 engaged in activity, days in past 30 orgasm from activity, age first engaged in activity, age first had orgasm from activity) of their sexual behaviors (PVI, masturbation, partner-performed masturbation, receiving cunnilingus); see [1,3,18,36]. Participants also completed the French version of a brief social desirability response bias scale [35]. Social desirability response bias (the tendency to present oneself in a socially desirable light, as opposed to being truthful in one’s responses) is a potential confound in many studies involving report of sensitive behaviors, and might also be viewed as a personality trait in itself, associated with diminished responsiveness to a variety of stimuli [37].

Immature psychological defense mechanisms were measured with a French translation of the 40-item Defense Style Questionnaire (DSQ-40) [16,38], which consists of self-descriptive statements assessing the conscious derivatives of defense mechanisms on a scale ranging from 1 (I totally disagree) to 9 (I totally agree). Of the 40 items, 24 are part of the immature defenses score (the remainder being part of the neurotic and mature defenses scores that are not directly related to the hypotheses). Immature defenses scores have been shown in validity studies to be associated with depression, personality disorders, and heavy consumption of alcohol before sex [16,18]. The total

immature defenses score consists of the sum of the subscale components: autistic fantasy, displacement, splitting, denial, isolation of affect, dissociation, projection, devaluation, somatization, rationalization, passive-aggression, and acting out. The internal consistency coefficient alpha and 4-week test-retest reliabilities of the immature scale score were 0.80/0.85, and for the two-item subscales: projection 0.64/0.77, passive-aggression 0.38/0.67, acting out 0.49/0.72, isolation of affect 0.56/0.70, devaluation -0.01/0.57, autistic fantasy 0.89/0.73, denial 0.10/0.48, displacement 0.17/0.80, dissociation 0.44/0.75, splitting 0.19/0.73, rationalization 0.73/0.53, and somatization 0.56/0.72 [38]. This pattern of reliabilities suggests that the immature scale score is both internally consistent and repeatable, but that most of the subscale scores consist of two facets of the defense (thus, not internally consistent, but consistent over time). It has been noted that coefficient alpha “can badly underestimate reliability when the test is not unidimensional” [39] (p. 270). As noted, the primary hypotheses in the present study involve the internally and temporally reliable immature scale score.

Statistical Analysis

History of orgasm triggered by PVI orgasm (ever, and any in the past month, in separate analyses) was predicted by means of binary logistic regression (with backwards elimination) from the predictors: immature psychological defenses, tactile sensitivity (filament), age, and social desirability score. Those logistic regressions were also repeated with the inclusion of the candidate predictor PVI frequency (past month). In addition, univariate correlations (Spearman’s rho) of tactile sensitivity, immature defenses, and social desirability with PVI measures (past month frequency, orgasm ever, past month at all, past month frequency) and the corresponding measures for the other sexual activities were calculated. On an exploratory basis (and to examine consistency with earlier studies [3,18], associations of each component individual immature defense subscale with PVI orgasm ever and in the past month were calculated. SPSS for Windows version 13.0 was used for analyses.

Results

Of the 71 volunteers, 70 women with a mean age of 22 years (SD = 3), provided complete answers. Table 1 provides a summary of respondent sexual activities.

Table 1 Participant sexual behaviors

	Mean (SD) days in past month
PVI	7.1 (7.2)
PVI orgasm	4.3 (6.3)
Anal sex	0.26 (0.8)
Anal sex orgasm	0.14 (0.6)
Masturbation	4.4 (4.8)
Masturbation orgasm	4.2 (4.7)
Partner masturbation	4.1 (5.5)
Partner masturbation orgasm	2.7 (5.9)
Cunnilingus	3.9 (5.7)
Cunnilingus orgasm	2.8 (5.0)

PVI = penile-vaginal intercourse.

Univariate correlational analysis (Spearman's rho) revealed that filament (inverse measure of sensitivity) was associated only with PVI past month frequency ($r = -0.241$, $P = 0.045$), but none of the other measures of sexual behavior. PVI orgasm past month frequency narrowly missed reaching significance ($r = -0.226$, $P = 0.06$). The immature psychological defense mechanisms score was inversely associated with all measures of PVI; more use of immature defenses was associated with lesser likelihood of ever having had an orgasm from PVI ($r = -0.28$, $P = 0.02$), lesser likelihood of having had an orgasm from PVI in the past month ($r = -0.40$, $P = 0.001$), lower frequency of orgasm from PVI in the past month ($r = -0.32$, $P = 0.008$), and lower frequency of PVI in the past month ($r = -0.35$, $P = 0.003$). The only other sexual behavior with which immature defenses was associated was lower frequency of partner masturbation ($r = -0.32$, $P = 0.007$), but it was uncorrelated with partner masturbation orgasm (frequency or any in the past month), suggesting that the partner masturbation was foreplay to the PVI. Social desirability responding was not associated with any of

the sexual behavior measures in the univariate analysis. Women who had any PVI in the past month did not differ from those who did not have PVI in the past month ($N = 18$) with regard to age or social desirability score, but they did have greater tactile thresholds (mean 3.5 vs. 3.3; $t = 2.05$, $P < 0.05$) and higher immature defenses scores (mean 3.75 vs. 3.28; $t = 2.13$, $P < 0.05$).

Table 2 provides details of the logistic regression predictions of any PVI orgasm ever. In the simpler regression model (without PVI frequency), it was predicted by lesser immature defenses score (odds ratio = 4.9 for each point; in the Tables the odds ratio displays the reciprocal in keeping with the displayed phrasing) and less social desirability responding (odds ratio = 1.9 for each point), but filament was not significant. In the regression model incorporating PVI frequency, any PVI orgasm ever was predicted by lower immature defenses score (odds ratio = 4.6 for each point) and less social desirability responding (odds ratio = 2.1 for each point), but filament was not significant, and PVI frequency also missed being significant. The overall Nagelkerke R^2 was similar with and without inclusion of PVI frequency.

Table 3 provides details of the logistic regression predictions of any PVI orgasm in the past month. In the simpler regression model (without PVI frequency), it was predicted by lower immature defenses scores (odds ratio = 4.0 for each point), higher tactile sensitivity (odds ratio = 5.1 for each point), and younger age (odds ratio = 1.3 for each year). In the regression model incorporating PVI frequency, any PVI orgasm in the past month was predicted by lower immature defenses scores (odds ratio = 6.3 for each point), greater PVI frequency (odds ratio = 1.44 for each PVI day in the month), and younger age (odds ratio = 1.68

Table 2 Logistic regression prediction of ever having a penile-vaginal intercourse orgasm (final step of backward stepwise procedure shown), without (upper Table) and with (lower Table) past month frequency of penile-vaginal intercourse as a candidate predictor

	B	SE	Wald statistic	P	Odds ratio
Without					
Immature	-1.592	0.677	5.539	0.019	0.203
Social desirability	-0.659	0.293	5.069	0.024	0.518
Age	-0.264	0.141	3.503	0.061	0.768
Filament	-2.534	1.607	2.486	0.115	0.079
Nagelkerke $R^2 = 0.335$.					
With					
Social desirability	-0.761	0.324	5.495	0.019	0.467
Immature	-1.535	0.682	5.065	0.024	0.216
Age	-0.277	0.151	3.395	0.065	0.758
PVI frequency	0.116	0.067	2.962	0.085	1.123
Nagelkerke $R^2 = 0.351$.					

Table 3 Logistic regression prediction of having a penile-vaginal intercourse orgasm in the past month (final step of backward stepwise procedure shown), without (upper Table) and with (lower Table) past month frequency of penile-vaginal intercourse as a candidate predictor

	B	SE	Wald statistic	P	Odds ratio
Without					
Immature	-1.392	0.439	10.059	0.002	0.249
Age	-0.293	0.112	6.907	0.009	0.746
Filament	-1.631	0.831	3.855	0.050	0.196
Nagelkerke $R^2 = 0.342$					
With					
PVI frequency	0.366	0.106	11.862	0.001	1.441
Immature	-1.840	0.686	7.189	0.007	0.159
Age	-0.523	0.210	6.213	0.013	0.593
Nagelkerke $R^2 = 0.644$					

for each year); tactile sensitivity was no longer significant when PVI frequency was included. The overall Nagelkerke R^2 was greater with inclusion of PVI frequency.

None of the other sexual activities were predicted by tactile sensitivity, immature defenses, or social desirability responding. Additional exploratory analyses included examination of the association of PVI orgasm ever and in the past month with each of the component immature defense mechanisms that contribute to the total immature defenses score. Dissociation was associated with lesser likelihood of PVI orgasm ever ($r = -0.24$, $P = 0.04$) and in the past month ($r = -0.28$, $P = 0.02$); isolation of affect was associated with lesser likelihood of PVI orgasm ever ($r = -0.35$, $P = 0.003$) and in the past month ($r = -0.40$, $P = 0.001$); autistic fantasy was associated with lesser likelihood of PVI orgasm in the past month ($r = -0.29$, $P = 0.02$); displacement was associated with lesser likelihood of PVI orgasm in the past month ($r = -0.24$, $P = 0.04$); and somatization was associated with lesser likelihood of PVI orgasm ever ($r = -0.24$, $P = 0.047$). Finally, the last set of exploratory analyses involved examining the association between the component immature defense mechanisms and tactile threshold. Only isolation of affect was significantly associated with higher finger threshold ($r = 0.285$, $P = 0.02$).

Discussion

In univariate analyses, tactile sensitivity was associated only with PVI past month frequency. Immature psychological defenses was inversely associated with all measures of PVI and PVI orgasm (as well as with partner masturbation, but not partner masturbation orgasm, suggesting that the partner masturbation was foreplay to the PVI

[25]). None of the other sexual activities or orgasm were associated with tactile sensitivity or immature defenses.

Multivariate analysis revealed that PVI orgasm ever was associated with lesser use of immature psychological defenses, and lesser social desirability responding—but not with tactile sensitivity. These results remained similar when PVI frequency was added as a predictor variable.

Multivariate analysis revealed that PVI orgasm in the past month was predicted by lesser use of immature defense mechanisms, greater tactile sensitivity, and younger age. However, when PVI frequency was added to the candidate predictors, it displaced tactile sensitivity (and overall Nagelkerke R^2 increased). This PVI frequency effect is consistent with the theory [1] that greater tactile sensitivity is associated with greater reinforcement susceptibility of specifically PVI, hence, the larger realm of rewards of greater PVI frequency beyond simple tactile sensitivity (with which it was correlated) might overwhelm the tactile sensitivity statistical variance. Of note, non-zero PVI frequency directly suggests some degree of (at least temporary) partnership, and therefore PVI-specific interpersonal factors would count among those rewards that might overwhelm the statistical effect of tactile sensitivity.

In all multivariate models, immature defenses were robustly associated with lower likelihood of PVI orgasm. The findings are consistent with previous findings of not only overall immature defenses and lower likelihood of vaginal orgasm, but even the specific component immature defenses. In the present study, dissociation, isolation of affect, autistic fantasy, somatization, and displacement were associated with lesser likelihood of PVI orgasm, replicating findings by Brody & Costa [3], as well as other findings of negative

associations between vaginal orgasm and two of the five (autistic fantasy and displacement) [18].

In an exploratory analysis, the one component immature defense mechanism associated with greater tactile threshold was isolation of affect. In both diminished sensation (finger or vaginal response to PVI) and isolation of affect, there is a reduction in feeling deeply (it is not a coincidence that “feeling” refers to sensation as well as emotion). This interpretation is consistent not only with a psychodynamic view and the aforementioned concept of aversive experiences leading to a functional down-regulation of global tactile sensitivity [1], but also theory and research findings on embodied cognition, in which cognition (including capacity to sense touch) and aspects of the body influence each other [40]. However, as several comparisons were conducted, interpretation of this nonpredicted effect remains somewhat speculative.

It was suggested by Brody et al. [1] that tactile sensitivity might increase the frequency of partnered (but not solitary) sexual activity, but some other dimension is more relevant to orgasmic capacity. The present findings suggest that: (i) PVI, rather than general partnered sexual activity, is associated with better tactile sensitivity, and that (ii) the relative absence of certain types of immature defenses (especially those directly impairing emotion and/or sensation) allows orgasm from PVI.

Shortcomings of the study include: (i) no measure of sexual dysfunction per se; (ii) no explicit verification that all PVI orgasm was vaginal orgasm (however, this is likely, because there was no association of sensitivity or immature defenses with any other sexual activities, and there was remarkable similarity of the immature defenses component results to previous studies specifying vaginal orgasm [3,18]); and (iii) a fairly young sample, and only self-report of good health (as opposed to medical examination and hormonal measurements). The sample size was only moderate, and although the sample size was adequate to detect a correlation of 0.3 (alpha 0.05, one-tailed) between sexual behavior (or orgasm) frequencies and either tactile sensitivity or immature defenses with statistical power of greater than 0.80, small effect sizes might not have been readily detectable. Although sometimes associated with pain sensitivity, menstrual phase is not consistently associated with tactile threshold [41,42], so our not measuring menstrual phase might have, at most, slightly diminished the observed associations of tactile sensitivity with PVI orgasm. Although analyses

included measures of various sexual behaviors, there was no specification of the sex of the partners for sexual activities (other than implicitly for PVI), and therefore it is possible that some of the findings could be related to unmeasured nonheterosexuality. Future research should include as many specifics of sexual activities and partner characteristics as is feasible. Given that “Women’s relationship quality is associated with specifically PVI orgasm and frequency” [26] and that greater past month frequency of intercourse appears to offset the usual untoward relationship implications of attachment insecurity [43], future studies might also include sensitive measures of relationship quality as well.

Strengths of the study include (i) multivariate analysis successfully integrating tactile sensitivity and lesser use of immature defense mechanisms in the prediction of PVI orgasm (as compared with other orgasm triggers); (ii) cross-cultural replication with French-Canadian women of the immature defenses aspect (with results similar to studies conducted in Portugal and United Kingdom); and (iii) examination of the role of social desirability responding. Sexual medicine should be aware of differences between various sexual behaviors and orgasm elicitation methods, and be aware of not only the traditional issues to be considered in evaluating patients, but additionally both subtle sensory (not only obvious neuropathies or the prime risk groups, including diabetics) and emotional (psychosexual development) factors in the evaluation of suboptimal sexual function, and encourage greater attention to vaginal sensation during PVI.

Conclusions

The results add further evidence to differences between sexual behaviors [2], and further evidence that impairment of specifically PVI orgasm (as opposed to orgasm elicited by other triggers) is associated with impairment of attention [15], sensation, and psychosexual development. Sexual medicine should be aware of these differences, consider both subtle sensory (not only obvious neuropathies) and emotional factors in the evaluation of suboptimal sexual function, and encourage greater attention to vaginal sensation during PVI.

Corresponding Author: Stuart Brody, PhD, School of Social Sciences, University of the West of Scotland, High Street, Paisley, PA1 2BE, UK. Tel: +44-141-8494020; Fax: +44-141-8483891; E-mail: stuartbrody@hotmail.com

Conflict of Interest: None.

Statement of Authorship**Category 1****(a) Conception and Design**

Stuart Brody; Ursula Hess

(b) Acquisition of Data

Stephanie Houde

(c) Analysis and Interpretation of Data

Stuart Brody; Stephanie Houde; Ursula Hess

Category 2**(a) Drafting the Article**

Stuart Brody

(b) Revising It for Intellectual Content

Stuart Brody; Stephanie Houde; Ursula Hess

Category 3**(a) Final Approval of the Completed Article**

Stuart Brody; Stephanie Houde; Ursula Hess

References

- 1 Brody S, Fischer AH, Hess U. Women's finger sensitivity correlates with partnered sexual behavior but not solitary masturbation frequencies. *J Sex Marital Ther* 2008;34:343–52.
- 2 Brody S. The relative health benefits of different sexual activities. *J Sex Med* 2010;7:1336–61.
- 3 Brody S, Costa RM. Vaginal orgasm is associated with less use of immature psychological defense mechanisms. *J Sex Med* 2008;5:1167–76.
- 4 Esposito K, Ciotola M, Giugliano F, Carleo D, Schisano B, Maglione E, Di Tommaso D, De Sio M, Giugliano D. Quantitative sensory and autonomic testing in nondiabetic women with sexual dysfunction. *J Sex Med* 2007;4:1367–72.
- 5 Frohlich PF, Meston CM. Tactile sensitivity in women with sexual arousal disorder. *Arch Sex Behav* 2005;34:207–17.
- 6 Frohlich P, Meston CM. Fluoxetine-induced changes in tactile sensation and sexual functioning among clinically depressed women. *J Sex Marital Ther* 2005;31:113–28.
- 7 Rowland DL, Strassberg DS, de Gouveia Brazao CA, Slob AK. Ejaculatory latency and control in men with premature ejaculation: An analysis across sexual activities using multiple sources of information. *J Psychosom Res* 2000;48:69–77.
- 8 Edwards AE, Husted JR. Penile sensitivity, age, and sexual behavior. *J Clin Psychol* 1976;32:697–700.
- 9 Salonia A, Sacca A, Briganti A, Del Carro U, Deho F, Zanni G, Rocchini L, Raber M, Guazzoni G, Rigatti P, Montorsi F. Quantitative sensory testing of peripheral thresholds in patients with lifelong premature ejaculation: A case-controlled study. *J Sex Med* 2009;6:1755–62.
- 10 Paick JS, Jeong H, Park MS. Penile sensitivity in men with premature ejaculation. *Int J Impot Res* 1998;10:247–50.
- 11 Rowland DL, Haensel SM, Blom JH, Slob AK. Penile sensitivity in men with premature ejaculation and erectile dysfunction. *J Sex Marital Ther* 1993;19:189–97.
- 12 Komisaruk BR, Whipple B. Love as sensory stimulation: Physiological consequences of its deprivation and expression. *Psychoneuroendocrinology* 1998;23:927–44.
- 13 McCray GM. Excessive masturbation of childhood: A symptom of tactile deprivation? *Pediatrics* 1978;62:277–9.
- 14 Pauli P, Schwenzer M, Brody S, Rau H, Birbaumer N. Hypochondriacal attitudes, pain sensitivity, and attentional bias. *J Psychosom Res* 1993;37:745–52.
- 15 Brody S, Weiss P. Vaginal orgasm is associated with vaginal (not clitoral) sex education, focusing mental attention on vaginal sensations, intercourse duration, and a preference for a longer penis. *J Sex Med* 2009; Sep 1 [Epub ahead of print] doi: 10.1111/j.743-6109.2009.01469.x.
- 16 Bond M. Empirical studies of defense style: Relationships with psychopathology and change. *Harv Rev Psychiatry* 2004; 12:263–78.
- 17 Blaya C, Dornelles M, Blaya R, Kipper L, Heldt E, Isolan L, Bond M, Manfro GG. Do defense mechanisms vary according to the psychiatric disorder? *Rev Bras Psiquiatr* 2006;28:179–83.
- 18 Costa RM, Brody S. Immature defense mechanisms are associated with lesser vaginal orgasm consistency and greater alcohol consumption before sex. *J Sex Med* 2010;7:775–86.
- 19 Freud S. My views on the part played by sexuality in the etiology of the neuroses. In: Strachey J, trans. The standard edition of the complete psychological works of Sigmund Freud. London: Hogarth; 1953:271–2.
- 20 Freud S. New introductory lectures on psychoanalysis. In: Strachey J, trans. The standard edition of the complete psychological works of Sigmund Freud, Vol. 22. London: Hogarth; 1953:5–185.
- 21 American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). 4th edition. Washington, DC: American Psychiatric Association; 1994.
- 22 O'Connell HE, Eizenberg N, Rahman M, Cleeve J. The anatomy of the distal vagina: Towards unity. *J Sex Med* 2008;5:1883–91.
- 23 Komisaruk BR, Whipple B. Functional MRI of the brain during orgasm in women. *Annu Rev Sex Res* 2005;16:62–86.
- 24 Brody S. Vaginal orgasm is associated with better psychological function. *Sex Relat Ther* 2007;22:173–91.
- 25 Brody S, Costa RM. Satisfaction (sexual, life, relationship, and mental health) is associated directly with penile-vaginal intercourse but inversely with other sexual behavior frequencies. *J Sex Med* 2009;6:1947–54.
- 26 Costa RM, Brody S. Women's relationship quality is associated with specifically penile-vaginal intercourse orgasm and frequency. *J Sex Marital Ther* 2007;33:319–27.
- 27 Brody S. Intercourse orgasm consistency, concordance of women's genital and subjective sexual arousal, and erotic stimulus presentation sequence. *J Sex Marital Ther* 2007;33:31–9.
- 28 Brody S, Laan E, Van Lunsen RHW. Concordance between women's physiological and subjective sexual arousal is associated with consistency of orgasm during intercourse but not other sexual behavior. *J Sex Marital Ther* 2003;29:15–23.
- 29 Weiss P, Brody S. Female sexual arousal disorder with and without a distress criterion: Prevalence and correlates in a representative Czech sample. *J Sex Med* 2009;6:3385–94.
- 30 Nicholas A, Brody S, de Sutter P, de Carufel F. A woman's history of vaginal orgasm is discernible from her walk. *J Sex Med* 2008;5:2119–24.
- 31 Brody S, Costa RM. Overestimation of heterosexually attributed AIDS deaths is associated with immature psychological defence mechanisms and clitoral masturbation during penile-vaginal intercourse. *Int J STD AIDS* 2009;20:869–75.
- 32 Frohlich P, Meston C. Sexual functioning and self-reported depressive symptoms among college women. *J Sex Res* 2002;39:321–5.
- 33 Morrissette DL, Goldstein MK, Raskin DB, Rowland DL. Finger and penile tactile sensitivity in sexually functional and dysfunctional diabetic men. *Diabetologia* 1999;42:336–42.
- 34 Stoelting Co. Touch test sensory evaluators (manual). Wood Dale, IL: Stoelting Co; 2001.
- 35 Ballard R. Short forms of the Marlowe-Crowne Social Desirability Scale. *Psychol Rep* 1992;71:1155–60.

- 36 Costa RM, Brody S. Condom use for penile-vaginal intercourse is associated with immature psychological defense mechanisms. *J Sex Med* 2008;5:2522–32.
- 37 Brody S, Veit R, Rau H. Lie scores are associated with less cardiovascular reactivity to baroreceptor stimulation and to mental arithmetic stress. *Pers Individ Differ* 1997;22:677–81.
- 38 Andrews G, Singh M, Bond M. The Defense Style Questionnaire. *J Nerv Ment Dis* 1993;181:246–56.
- 39 Miller MB. Coefficient alpha: A basic introduction from the perspectives of classical test theory and structural equation modeling *Struct Equ Modeling*. 1995;2:255–73.
- 40 Barsalou LW, Kyle Simmons W, Barbey AK, Wilson CD. Grounding conceptual knowledge in modality-specific systems. *Trends Cogn Sci* 2003;7:84–91.
- 41 Bajaj P, Arendt-Nielsen L, Bajaj P, Madsen H. Sensory changes during the ovulatory phase of the menstrual cycle in healthy women. *Eur J Pain* 2001;5:135–44.
- 42 Parlee MB. Menstrual rhythm in sensory processes: A review of fluctuations in vision, olfaction, audition, taste, and touch. *Psychol Bull* 1983;93:539–48.
- 43 Little KC, McNulty JK, Russell VM. Sex buffers intimates against the negative implications of attachment insecurity. *Pers Soc Psychol Bull* 2010;36:484–98.