Specifically Penile-Vaginal Intercourse Frequency Is Associated With Better Relationship Satisfaction: A Commentary on Hicks, McNulty, Meltzer, and Olson (2016)

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In a recent *Psychological Science* article, Hicks, McNulty, Meltzer, and Olson (2016) asserted that previous research on the association between sexual frequency and relationship satisfaction led to inconclusive results. However, Hicks et al. overlooked good evidence that there is a consistent relationship between penile-vaginal intercourse frequency and measures of relationship satisfaction (among other dimensions of satisfaction and indices of psychological and physical health and function; Brody, 2010; Brody & Costa, 2009; Brody, Costa, Hess, & Weiss, 2011; Costa & Brody, 2007; Maunder, Schoemaker, & Pruessner, 2017; Santtila et al., 2008; Smith, Nezlek, Webster, & Paddock, 2007). Other sexual behaviors (e.g., masturbation, anal sex, cunnilingus) are generally uncorrelated or even adversely associated with relationship satisfaction and other satisfaction measures (Brody, 2010). The significance of the associations between penile-vaginal intercourse and relationship satisfaction remains consistent in studies using large representative population samples or multivariate methods to control for the frequency of all measured sexual behaviors (Brody & Costa, 2009; Santtila et al., 2008). Space limitations preclude presenting a meta-analysis of the correlations between penile-vaginal intercourse frequency and relationship satisfaction, but examples include effect sizes (Cohen's *ds*) such as 0.72 for men and 0.63 for women in a nationally representative Swedish sample ($N = 2,810$; Brody & Costa, 2009), 0.21 for men and 0.32 for women in a Finnish study of twins ($N = 3,604$; Santtila et al., 2008), and 1.04 for women in a convenience sample from Portugal ($N = 30$; Costa & Brody, 2007).

Unfortunately, many studies fail to differentiate between penile-vaginal intercourse and other sexual behaviors, which thereby precludes the ability to detect essential differences between sexual behaviors. Various studies have found that when sexual behaviors are not very clearly defined, some individuals even exclude certain categories of sexual activities from their definition of sex (Byers, Henderson, & Hobson, 2009; Gute, Eshbaugh, & Wiersma, 2008; Peterson & Muehlenhard, 2007). Hicks et al. noted that in their own study results, there might have been a biasing effect due to not being sufficiently specific regarding definitions of sex. The two studies that Hicks et al. cited as not finding an association between sexual frequency and relationship satisfaction actually measured “any sexual engagement between spouses in which at least one of the spouses experienced an orgasm” (Hurlbert & Apt, 1994, p. 491) and “any mutually voluntary activity that involves genital contact and/or stimulation, even if intercourse or orgasm did not occur” (Heiman et al., 2011, p. 744).

It has been noted that sexual pleasure is an evolutionary adaptation that ultimately motivates people to engage in penile-vaginal intercourse in the service of reproduction; however, sexual pleasure can be diverted to other functions, and people can engage in sexual behaviors other than penile-vaginal intercourse for the

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purpose of obtaining pleasure (Abramson & Pinkerton, 2002). However, the fact that some sexual behaviors (or many other behaviors, such as ingesting intoxicating substances) are experienced as pleasurable by some people does not imply that such behaviors are associated favorably with satisfaction or indices of psychological or physiological health and functioning. There are many possible reasons why penile-vaginal intercourse (and the orgasms triggered by penile-vaginal intercourse without concurrent masturbation by either partner) but not other sexual behaviors (and corresponding orgasm triggers) would be associated with increased relationship satisfaction. Evolutionary processes should be expected to favor the one sexual behavior that is potentially reproductive (penile-vaginal intercourse). The link between penile-vaginal intercourse and more intimate relationship quality could provide an adaptive advantage by influencing better pair bonding, which could lead to better parental care, which is in turn directly associated with children's health and quality of life (a review of the paternal investment issues can be found in Geary, 2000). Moreover, empirical findings indicate that female coital orgasm may help women select mates who provide genetic benefits to their offspring (Shackelford et al., 2000). Research has also demonstrated that penile-vaginal intercourse and other sexual behaviors have differential associations with alexithymia for women (Brody, 2003), indices of vagal tone associated with longevity and emotion regulation (Costa & Brody, 2012; and perhaps pair-bonding processes, including love; Porges, 1998), and stress response (Brody, 2006). Of note, when well-differentiated sexual behaviors and the orgasms they generate are concurrently examined as putative predictors of an index of vagal tone (heart rate variability), only orgasms associated with penile-vaginal intercourse were statistically significant (Costa & Brody, 2012). There are even different peripheral and central neurophysiological pathways involved in at least vaginal, clitoral, and cervical stimulation (Komisaruk et al., 2011).

Measures that might help overcome response biases in studies of relationship satisfaction and sexual behavior are indeed important. Such measures include not only the implicit measures presented by Hicks et al., but also social-desirability response-bias measures (Costa & Brody, 2007) and physiological measures. Of note, in addition to implicit and explicit psychological measures of satisfaction, neurohormonal indices of orgasm-related sexual satisfaction have also been developed (Brody & Kruger, 2006; Leeners et al., 2013), and penile-vaginal intercourse was found to produce dramatically greater neurohormonal effects than masturbation-induced orgasm. These latter studies are

among the few to use experimental designs (rather than the usual correlational approaches) to demonstrate links between orgasm resulting from penile-vaginal intercourse and satisfaction. The studies demonstrated that the prolactin surges that modulate dopaminergic function differ greatly between sexual behaviors and that such surges are strongly associated with women's sexual satisfaction from orgasm resulting from penile-vaginal intercourse. It has been proposed that dopaminergic pathways underlie processes of romantic attraction (Fisher, Aron, & Brown, 2006). Of course, in addition to any causal effect of greater penile-vaginal intercourse frequency and quality (including orgasm) on relationship satisfaction and other aspects of satisfaction, it may be that people less satisfied with their relationship might be less eager to have penile-vaginal intercourse with their partner. Future research on relationship satisfaction (and other dimensions of satisfaction; Brody & Costa, 2009) and their associations with specific sexual behaviors and responses might include implicit and explicit psychological measures as well as physiological measures.

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