

Original Article

Men's masculinity and attractiveness predict their female partners' reported orgasm frequency and timing

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Abstract

It has been hypothesized that female orgasm evolved to facilitate recruitment of high-quality genes for offspring. Supporting evidence indicates that female orgasm promotes conception, although this may be mediated by the timing of female orgasm in relation to male ejaculation. This hypothesis also predicts that women will achieve orgasm more frequently when copulating with high-quality males, but limited data exist to support this prediction. We therefore explored relationships between the timing and frequency of women's orgasms and putative markers of the genetic quality of their mates, including measures of attractiveness, facial symmetry, dominance, and masculinity. We found that women reported more frequent and earlier-timed orgasms when mated to masculine and dominant men—those with high scores on a principal component characterized by high objectively-measured facial masculinity, observer-rated facial masculinity, partner-rated masculinity, and partner-rated dominance. Women reported more frequent orgasm during or after male ejaculation when mated to attractive men—those with high scores on a principal component characterized by high observer-rated and self-rated attractiveness. Putative measures of men's genetic quality did not predict their mates' orgasms from self-masturbation or from non-coital partnered sexual behavior. Overall, these results appear to support a role for female orgasm in sire choice.

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1. Introduction

Female orgasm may have evolved to function in sire choice by increasing the probability of fertilization from high quality males (Puts, 2006, 2007; Puts & Dawood, 2006; Smith, 1984; Thornhill, Gangestad, & Comer, 1995). Such an adaptation could be favored by selection if some ancestral females mated (1) within a single ovulatory cycle with males who varied in quality and/or (2) in different ovulatory cycles with males of varying quality, but the costs of forgoing fertilization in one cycle were sometimes offset by the benefits of reproducing with a higher quality male in a future cycle.

Consistent with the sire choice hypothesis, several lines of evidence suggest that women's orgasm promotes conception. For example, peristaltic uterine contractions

transport sperm through the female reproductive tract in humans (Zervomanolakis et al., 2007, 2009) and nonhuman animals (Fox & Fox, 1971; Singer, 1973). These peristaltic contractions are induced both by electrical stimulation in nonhuman animals (Beyer, Anguiano, & Mena, 1961; Setekleiv, 1964) of brain regions activated during orgasm in women (Komisaruk et al., 2004) and by treatment in women with oxytocin (Wildt, Kissler, Licht, & Becker, 1998; Zervomanolakis et al., 2007, 2009), a hormone released during orgasm (Blancher et al., 1999; Carmichael et al., 1987; Carmichael, Warburton, Dixen, & Davidson, 1994). Importantly, during the fertile phase of the ovulatory cycle, oxytocin induces the transport of a semen-like fluid into the oviduct with the dominant follicle (Wildt et al., 1998). Such directed transport should promote fertilization by bringing the sperm into proximity with the ovum and the oviductal epithelium. Contact with oviductal epithelium may prolong sperm longevity, increase the number of capacitated sperm (sperm capable of fertilizing an ovum), and lengthen the interval over which some

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sperm in an ejaculate are capacitated (Smith, 1998; Suarez, 1998, but see Levin, 2002).

Orgasm (Fox, Wolff, & Baker, 1970) and oxytocin (Wildt et al., 1998) may reverse uterine pressure from outward to inward, which may prevent sperm loss from “flowback” and aid sperm in reaching the oviducts. Indeed, Baker and Bellis (1993) found that female orgasm predicted greater sperm retention, although these results have been questioned (Lloyd, 2005, but see Puts & Dawood, 2006). Female orgasm may also allow the earlier entry of sperm into the cervix by resolving the “vaginal tenting” of sexual arousal, which elevates the cervix from the posterior vaginal wall, removing it from the semen pool (Levin, 2002). This should remove sperm from the more hostile environment of the vagina, prevent sperm loss, and help sperm reach the oviducts (Fox & Fox, 1971). Prolactin secretion during orgasm may also capacitate sperm (Meston, Levin, Sipski, Hull, & Heiman, 2004). Orgasmic vaginal contractions may excite male ejaculation (Fox & Fox, 1971; Meston et al., 2004), which could coordinate ejaculation with the various possible conception-enhancing processes associated with orgasm in women. Finally, the affective reward value of orgasm (e.g., Eschler, 2004) may motivate women to continue copulating until orgasm is achieved, or to copulate again with males with whom they experienced orgasm.

In addition, the timing of women’s orgasm may influence conception. Baker and Bellis (1993) found that women’s orgasms between 1 min before and 45 min after male ejaculation predicted sperm retention. Thus, orgasm either immediately before or within a long interval after ejaculation may promote conception. Alternatively, indirect evidence suggests that female orgasm specifically before male ejaculation promotes conception. Female orgasm before ejaculation is associated with greater sexual satisfaction (Darling, Davidson, & Cox, 1991), perhaps because it allows for coital and possibly vaginal orgasm, which women may find more satisfying than clitorally-induced orgasm (Davidson & Darling, 1989). Because positive emotion may function to reinforce fitness-enhancing behavior (Plutchik, 1980), this timing effect suggests greater fitness benefits, such as elevated probability of conception, when female orgasm occurs before ejaculation. Moreover, greater sexual satisfaction is likely to stimulate greater oxytocin release (Carmichael et al., 1994), which evidence reviewed above suggests would further elevate the probability of fertilization.

If female orgasm functions in sire choice by promoting conception, then women should be likelier to experience orgasm with males whose genes would augment fitness in the women’s offspring. Testing this proposition is complicated in part because evolutionary biologists have no ideal metric for genetic quality. However, several measures are commonly used.

The major histocompatibility complex (MHC) is the main genomic region mediating disease resistance, and

mating with MHC-compatible mates (those discordant at MHC loci) should produce offspring with stronger immune systems (Potts & Wakeland, 1993). Olfactory preferences for MHC-compatible mates have been observed across vertebrate taxa, including humans (reviewed in Roberts & Little, 2008, see also Chaix, Cao, & Donnelly, 2008; Lie, Rhodes, & Simmons, 2008; Roberts et al., 2005). Women reported more orgasms if their MHC genes were complementary with their partner’s, but only during the fertile ovulatory cycle phase (Garver-Apgar, Gangestad, Thornhill, Miller, & Olp, 2006).

Physical attractiveness is another putative measure of genetic quality (Andersson, 1994; Gangestad & Buss, 1993; Grammer, Fink, Moller, & Thornhill, 2003). Men’s attractiveness predicted their female partner’s copulatory orgasm frequency, although men’s partners assessed attractiveness, so orgasm may have caused women to find their partners more attractive, rather than the reverse (Shackelford et al., 2000). In another study, women’s reported copulatory orgasms were marginally significantly more frequent if their mates were independently rated as being more attractive and significantly more frequent if their mates had lower bodily fluctuating asymmetry (FA, asymmetry in anatomical traits that are normally bilaterally symmetric, a putative inverse measure of genetic quality) (Thornhill et al., 1995).

Androgen-dependent, masculine traits may also indicate heritable fitness because androgens may be produced in proportion to inherited immunocompetence (Folstad & Karter, 1992) and in inverse proportion to number of harmful mutations (Zahavi & Zahavi, 1997). In addition, many masculine traits may have originated in men primarily through male dominance contests rather than female choice (Puts, 2010) but may be especially strong indicators of genetic quality. This is because traits used in contests tend to be costly to produce, constantly tested by competitors, and thus should provide accurate information about male quality to potential mates (Berglund, Bisazza, & Pilastro, 1996). However, we are aware of no study that has explored relationships between men’s masculinity or dominance and orgasm in their mates.

We therefore examined relationships between putative markers of men’s genetic quality: attractiveness ratings, dominance ratings, facial FA and masculinity (rated and objectively measured from facial images)—and the frequency and timing of copulatory orgasm in their female partners.

2. Methods

2.1. Participants

Participants were drawn from a larger study of relationship formation comprising 117 heterosexual couples from a north eastern US university. Excluding couples in which at least one member opted out after participating, did not consent to being photographed or exhibited facial

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