

## Normal Variations in Personality are Associated with Coital Orgasmic Infrequency in Heterosexual Women: A Population-Based Study

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### ABSTRACT

**Introduction.** As many as 20–30% of women report an inability to orgasm during sexual intercourse. Some female sexual problems have been reported to cluster with psychological and social problems. Underlying personality type may play a role in the development or maintenance of such problems.

**Aim.** The aim of this study was to investigate whether certain domains of personality are associated with female coital orgasmic infrequency. To our knowledge this is the first such study in a large unselected population.

**Methods.** A total of 2632 women (mean age 51) from the TwinsUK registry completed questionnaires relating to personality and sexual behavior. Personality domains were assessed using the validated Ten-Item Personality Index (TIPI). Coital orgasmic frequency was measured using a seven-point Likert scale.

**Main Outcome Measures.** Using logistic regression, we investigated whether variations in five domains of personality are associated with female coital orgasmic infrequency. Discordant twin analysis was used to verify findings.

**Results.** Introversiveness (odds ratio [OR] 2.5, 95% confidence interval [CI] 1.7–3.7), emotional instability (OR 2.0, 95% CI 1.3–3.1), and not being open to new experience (OR 2.4, 95% CI 1.6–3.6) were significantly associated with orgasmic infrequency, whereas indices of agreeableness and conscientiousness were not significantly associated with orgasm frequency.

**Conclusion.** Specific personality subtypes appear to be significant risk factors for orgasmic infrequency. Consideration of these behavioral risk factors may need to be incorporated into research into female orgasmic disorder, and possible approaches to its treatment. **Harris JM, Cherkas LF, Kato BS, Heiman JR, and Spector TD. Normal variations in personality are associated with coital orgasmic infrequency in heterosexual women: A population-based study. J Sex Med 2008;5:1177–1183.**

**Key Words.** Female; Orgasm; Frequency; Personality; Twins

### Introduction

Female sexual dysfunction (FSD) is used as an umbrella term that captures disorders related to sexual desire, arousal, orgasm, and sexual pain. Guidelines currently recommend medical, sexual, and psychosocial history assessments in the evaluation of FSD [1]. Female orgasmic disorder, the second most frequently reported women's sexual problem, is defined by the DSM-IV-TR as the "Persistent or recurrent delay in, or absence of, orgasm following a normal sexual excitement phase

that causes marked distress or interpersonal difficulty" [2]. Despite limited objective data, female anorgasmia appears to be more commonly associated with psychological, emotional, and social problems than with physiological factors [3–5]. It is reported that 20% to 30% of women never or infrequently achieve orgasm through intercourse (coital orgasm) [6–8]. Our previous research using twins has shown that female coital orgasmic infrequency has an estimated heritability of 34%, suggesting that both genetic and environmental factors may contribute to female orgasm problems [9].

Most reports to date have focused on the prevalence of FSD [6–8], clinical biologic pathophysiology of sexual dysfunction [10,11], therapy for FSD [12,13], and demographic and general medical and psychosocial risk factors for FSD [4,6,8,14]. There appears to be a general consensus in the literature that more studies are needed in this field. Those few studies that report specifically on orgasm problems found that, on the whole, age, physical inactivity, vascular diseases, smoking, and hysterectomy are not significantly associated with increased risk for orgasm problems, whereas women with depression, anxiety, marital or relationship difficulties do appear to be at increased risk [4,14]. However, not all studies in this field use published definitions related to frequency of orgasm, which limits their comparative value [8]. Despite the apparent high prevalence of female anorgasmia and its association with a number of psychosocial risk factors, to our knowledge, no studies have yet investigated whether it is associated with normal variations in basic personality. Normal variations in personality have been associated with a wide range of conditions and behaviors, including erectile dysfunction [15], susceptibility to infectious disease [16], smoking initiation [17], and eating disorders [18], among others.

### Aims

The aim of this study is to investigate whether normal variations in personality are associated with coital orgasmic infrequency in a nonclinical, unselected population. This may be an important first step to identifying behavioral risk factors that may be associated with orgasmic disorder.

### Methods

#### Subjects

All subjects were volunteer female monozygotic (MZ) and dizygotic (DZ) twins enlisted from the TwinsUK registry [19]. All twins in the registry were recruited through national media campaigns and from other twin registers. The twins in the registry are not selected for any particular trait and they volunteer to take part in studies that cover a wide range of traits and common medical conditions. The study was approved by the St Thomas' Hospital research ethics committee, and all twins in the study provided informed consent. Twins from this registry have been shown to be

comparable to the age-matched general population singletons for a broad variety of medical and behavioral traits [20].

#### Questionnaires

A self-completion questionnaire on sexual behavior including demographic information, as well as questions to identify potential risk factors for female orgasmic infrequency was sent to all 8,418 female twins in the registry (aged between 18 and 83, with a mean age of 50). The following areas were covered in this questionnaire: marital status, number of children, smoking status, number of sexual partners, current age, age at menarche, age at first pregnancy, religiosity, social class, body mass index, and history of depression. In addition subjects were asked: "As a child were you ever a victim of sexual abuse?" and "As a child, were you ever a victim of physical abuse?"

Subjects were also asked questions about general sexual behavior and more specifically on frequency of orgasm during intercourse. Subjects who were no longer sexually active were asked to recall frequency of orgasm during a time that they were sexually active. The question asked was "Overall, how frequently do you experience an orgasm during intercourse?" Respondents were asked to give their responses on a seven-point Likert scale from "never" (1) to "always" (7) (rated as in Table 1).

In a follow-up questionnaire, the twins were then sent a general behavior questionnaire containing the Ten-Item Personality Index (TIPI) which consists of validated questions summarizing personality types (see Appendix) [21]. The Big Five personality dimensions on which the TIPI is based is an extensively used model of personality, the premise of which is that human personality can be classified into five broad, empirically derived personality domains: extroversion, agreeableness, conscientiousness, emotional stability, and open-

**Table 1** Numbers and ages of subjects by orgasm frequency

	Numbers	%	Mean age (standard deviation)
Orgasm frequency response (Likert rating)			
Never (1)	416	16	51 (12)
<25% (2)	429	16	51 (11)
25–49% (3)	215	8	51 (12)
About 50% (4)	354	13	52 (12)
51–75% (5)	284	11	50 (12)
>75%/Always (6/7)	934	36	50 (11)
Total	2,632	100	51 (12)

ness to experiences. TIPI was shown to reach adequate levels in terms of convergent (mean  $r = 0.77$ ) and discriminant validity (absolute mean  $r = 0.20$ ), test-retest reliability (mean  $r = 0.72$ ) and patterns of external correlates [21]. The TIPI uses two related items (one of which is reversed) for each of the five domains to give a total of 10 items. Subjects were asked how much they agreed or disagreed with each of the 10 personality traits using a seven-point Likert scale. To score each domain, the two related items are placed in the same direction and are averaged to give a final score between 1 and 7 for each of the five domains for use in analysis (see Appendix). Because the two questionnaires were sent separately and included questions on a variety of clinical and behavioral phenotypes, subjects were unaware of the hypothesis being studied.

**Main Outcome Measures**

First, we created two groups of women, those who report that they never achieve coital orgasm (hereby termed low-frequency orgasm group—LFOs), and women who experience coital orgasm 75–100% of the time, merging Likert ratings 6 and 7 (hereby termed high-frequency orgasm group—HFOs), see Table 1. Then, using standard logistic regression techniques we looked for differences between these two groups with respect to a range of potential risk factors for orgasmic infrequency including demographic factors and published risk factors for sexual dysfunction [4,6,8,14] (Table 2). Because a confounder must be significantly associated with both the independent and dependent variable, only those factors that were found to be associated with orgasmic infrequency (the dependent variable) as well as personality (the independent variable) were included in subsequent analyses as confounders. All analyses were corrected for relatedness of twins in a pair. For all analyses, a  $P$  value less than 0.05% or a 95% confidence interval not including “1” was considered statistically significant.

To investigate the relationship between orgasmic infrequency and the five personality domains (scored 1–7), we conducted a trend analysis comparing HFOs and LFOs. To confirm our findings, we then regressed HFOs and LFOs against the lowest and highest quintiles of each personality domain. As a further confirmation of these analyses, we looked at within twin pair personality differences (using a  $t$  test) for 73 twin pairs who were raised together, but are discordant for orgasmic

**Table 2** Univariate logistic regression analysis of potential risk factors for orgasmic infrequency in the study population. Significant results are shown in bold

Risk Factor (unit)	Odds ratio (95% confidence interval)	$P$ value
<b>Childhood history of sexual abuse</b>	<b>1.56 (1.02, 2.39)</b>	<b>0.04</b>
<b>Unmarried status</b>	<b>1.39 (1.08, 1.79)</b>	<b>0.01</b>
<b>Childless-ness</b>	<b>1.93 (1.45, 2.56)</b>	<b>0.00</b>
Smoker	0.86 (0.59, 1.25)	0.42
Number of sexual partners (per decreasing number of partners)	1.01 (0.98, 1.0)	0.47
Age (per year)	1.01 (0.99, 1.02)	0.07
Age at Menarche (per year)	1.00 (0.91, 1.11)	0.92
Age at first pregnancy (per year)	1.01 (0.96, 1.06)	0.71
Religiosity (per unit increase)	1.01 (0.98, 1.06)	0.35
Childhood history of physical abuse	1.24 (0.8, 2.0)	0.37
Low social class (per unit increase)	1.03 (0.93, 1.15)	0.54
Body mass index (per unit increase)	1.00 (0.97, 1.02)	0.74
Depression (per unit increase)	1.01 (0.99, 1.02)	0.39

frequency (one LFO, the other HFO). This comparison helped to reduce the effect of random genetic and environmental variation on personality as MZ twins share 100% of their genes, DZ twins share on average 50% of their genes, and both shared nearly equal environments as children. All analyses were performed using STATA software.

**Results**

Of the 8,418 subjects (mean age of 50, standard deviation [SD] = 13, age range 18–83), 4,030 returned the sexual behavior questionnaire (48% response rate; mean age of 50, SD = 13, age range 18–82); 4,337 returned the general behavior questionnaire (52% response rate; age range 18–83, mean age 50, SD = 13); and 2,854 subjects (mean age 51, SD = 12, age range 18–78) returned both the sexual behavior and the general behavior questionnaires (34% of the total to whom the questionnaires were sent). Of the 2,854 subjects, 2,632 (mean age 51.0, SD = 12.0, age range 18–78) fully completed the TIPI questions and the question on frequency of orgasm during intercourse, were heterosexual, had engaged in sexual intercourse, and were hence used in the analysis. In comparison, the 5,564 women who were sent the questionnaire but were not included in the final analysis, had a mean age of 49, SD = 14, and an age range of 19–83.

Six percent of the 2,632 women used in the analysis described themselves as single, 70% married, 8% living with a male partner, 8%

divorced or separated, 4% widowed, and 4% in a relationship but not living together. Three in four had children (including adopted and stepchildren). The mean age of menarche was 13 (SD = 1.5), mean Body Mass Index (BMI) 26 (SD = 5.5), median number of sexual partners was 3 (SD = 6.5), and 14% were current smokers. Seven percent reported having experienced childhood sexual abuse, and the same proportion reported having experienced childhood physical abuse.

Table 1 summarizes the numbers and ages of all subjects by orgasm frequency. Four hundred sixteen subjects (16%) were classified as LFOs, and 934 (36%) as HFOs. We found that the mean age across all orgasm frequency categories was similar. The results of the univariate logistic regression analysis for risk factors for orgasmic infrequency expressed as odds ratios are shown in Table 2. Three factors, not being married, childlessness, and childhood history of sexual abuse were significantly associated with orgasmic infrequency. Being unmarried and a childhood history of sexual abuse were also significantly associated with the personality domains and thus were subsequently used in the analysis as confounders. Other factors such as increasing age, high body mass index, depression, and smoking, commonly associated with health and psychological conditions, were not found to be associated with coital orgasmic frequency. Number of sexual partners was also not found to be associated with coital orgasmic frequency.

The results of the trend analysis of orgasmic infrequency and each of the personality domains are summarized in Table 3. We found a linear increase in risk of coital orgasmic infrequency with increasing introversion ( $P < 0.00$ ), decreasing emotional stability ( $P < 0.00$ ), and decreasing openness to new experience ( $P < 0.00$ ). Furthermore, the effect appears to be additive as there was a significant linear increase in risk of orgasmic infrequency with the addition of each of the three significant personality domains ( $P < 0.00$ ). Table 3 also shows results of the regression of LFOs and the HFOs against the first and fifth quintile of each of the personality domains. These results confirmed the trend analyses, demonstrating that introversion, emotional instability, and not being open to new experience significantly increased risk for orgasmic infrequency. Not being agreeable and not being conscientious did not significantly increase risk, also confirming the previous trend results (Table 3).

Previous research has shown that both coital orgasmic frequency and all five personality domains are heritable (34%, and 41–61%, respectively) [9,22]. To check the consistency of the main analysis and partly control for the influence of genetic, cohort, and shared early life effects, we looked at the difference in personality within twin pairs discordant for orgasmic frequency (i.e., one twin an HFO, the other an LFO). Looking at differences in the 73 pairs of twins (24 identical, 49

**Table 3** Results of trend, logistic regression, and discordant twin analysis to identify differences in personality domains in HFOs and LFOs. Significant results are shown in bold

Personality domain*	Trend analysis <i>P</i> value <sup>†</sup>	Logistic regression (first vs. fifth quintile)		Discordant twin analysis (73 pairs)	
		OR (95% CI)	<i>P</i> value	Mean personality score <sup>‡</sup>	<i>P</i> value
<b>Introversion/extroversion</b>	<b>0.00, 0.00, 0.62</b>	<b>2.49 (1.67, 3.74)</b>	<b>0.00</b>	<b>LFO = 3.60</b>	<b>0.03</b>
Disagreeableness/agreeableness	0.65, 0.33, 0.68	1.26 (0.81, 1.95)	0.31	LFO = 2.27 HFO = 2.43	0.86
Not being conscientious/being Conscientious	0.11, 0.01, 0.67	1.45 (0.94, 2.24)	0.10	LFO = 2.03 HFO = 1.97	0.35
<b>Not being emotionally stable/being emotionally stable</b>	<b>0.00, 0.00, 0.78</b>	<b>2.02 (1.34, 3.05)</b>	<b>0.00</b>	<b>LFO = 3.67</b> <b>HFO = 3.10</b>	<b>0.01</b>
<b>Not being open to experience/being open to new experience</b>	<b>0.00, 0.00, 0.69</b>	<b>2.38 (1.57, 3.61)</b>	<b>0.00</b>	LFO = 3.29 HFO = 3.27	0.47

\*The personality domains are written so that the first mentioned personality descriptor (e.g., introversion) is the extremity of the personality domain scale that increases risk for orgasmic infrequency.

<sup>†</sup>The three numbers in the trend analysis column refer in order to (i) the *p*-value results of the over-all chi-square test (significant if <0.05) (ii) the *P* value results of the chi-square test for linear trend (significant if <0.05) (iii) the *P* value results of the chi-square test for departure from the linear trend line (results are significant [ $P > 0.05$ ] only if there is *not* significant departure from the trend line).

<sup>‡</sup>When answering the TIPI, subjects rate their agreement or disagreement with each of the personality traits using a seven-point Likert scale. Extreme extroversion, agreeableness, conscientiousness, emotional stability, and openness to new experience = 1, whereas extreme introversion, disagreeableness, unconscientiousness, emotional instability, and not being open to new experience = 7. The mean of these scores (between 1 and 7) among the LFOs and HFOs are given. HFO = high-frequency orgasm group; LFO = low-frequency orgasm group.

nonidentical) who were identified as being discordant for orgasm frequency showed that the LFO twin was significantly more likely to be introverted ( $P < 0.03$ ) or, independently, to be emotionally unstable ( $P < 0.01$ ) than the HFO twin, confirming our previous findings. Not being open to new experience was not confirmed as a significant risk factor in the discordant twin analysis, but the LFOs were marginally more likely to not be open to new experience (Table 3).

### Discussion

To our knowledge, these findings show for the first time that female coital orgasmic infrequency is associated with normal variations in some personality dimensions, namely introversion, emotional instability, and lack of openness to new experience, as well as history of childhood sexual abuse and unmarried status, (both reported previously [6,23]), and childlessness (see Table 2). The association of introversion and emotional instability with frequency of orgasm was confirmed using the robust technique of discordant twin analysis, which reduces the effect of genetic variation associated with personality. From an evolutionary point of view, female orgasm may play a role in achieving couple bonding and stability. Perhaps female introversion, emotional instability, and not being open to new experience affect mate selection, intimacy, couple bonding or communication in a way that increases the risk of female coital orgasmic infrequency, whereas agreeableness and conscientiousness have little affect on these factors. It has been reported that couples with an anorgasmic female partner report more troubled communication about sexual matters than control couples with a female partner who is able to orgasm [3].

The present study has common potential limitations. There may be response bias to the questionnaire which could lead to the self-selection of respondents who are more comfortable answering questions of a sexual nature. However, encouragingly, the response rate of 48% for the sexual behavior questionnaire was not significantly different to the response rate of 52% for the general behavior (nonsexual) questionnaire. Furthermore, the fact that there was little age difference between subjects sent the questionnaire, those used in the final analysis, and subjects not included in the final analysis, suggests that there is no real response bias in our sample. In addition, a previous study with the same twin sample found no differences

between respondents and nonrespondents [24]. This implies that results obtained in this study are generalizable to our entire twin cohort, which has already been shown to be representative of the general population. This conclusion is based on an extensive study that compared disease and prevalence of lifestyle characteristics between twins at the St Thomas' Hospital UK adult twin registry and a parallel population of singleton women, finding no difference between the groups, except for the finding that mean weight for adult MZ twins was found to be consistently lower than both DZ and singletons across all ages [20].

The prevalence of coital orgasmic infrequency in the study population was slightly lower than that reported in the literature. This may be as a result of different definitions of orgasmic infrequency in various studies and, in addition, there may be recall bias in this study, in recalling frequency of orgasm for those women currently sexually inactive. Although women are defined as LFOs in this study if they report that they never experience an orgasm during intercourse, we acknowledge that this is only one nonclinical aspect of sexual intercourse. This means that the generalizability of our results is limited as it does not allow us to identify (i) women with sexual dysfunction such as orgasmic disorder (e.g., women who attain an orgasm, but do so after an inordinate amount of time, or women who are unable to achieve an orgasm, which causes them distress); and (ii) women who attain orgasm with their partner either prior to or postintercourse. We could have used a standardized detailed validated questionnaire in the current study, such as the Female Sexual Function Index [25], but felt a more lengthy set of questions may have reduced the response rate.

The investigation between personality and clinically defined orgasmic dysfunction is clearly an area in which we will be conducting future research, as are the issues as to whether failure to orgasm causes distress, which is another aspect of FSD. Recent research on orgasmic dysfunction has indicated that the use of sexual techniques, levels of sexual satisfaction, erotic perception, and generational differences, should all be taken into account [26].

Specific personality risk factors such as introversion, emotional instability, and not being open to new experience, if associated with clinically defined orgasmic disorder, may influence therapeutic outcomes. Furthermore, given that some studies have shown that testosterone levels may

be implicated in female behavior [27], further research may show whether the degree of effectiveness of the testosterone patch, recently licensed in the EU as a clinical treatment for some cases of sexual dysfunction [28,29], is in fact mediated through personality. Because we have shown, in a previous study, that female coital orgasmic infrequency has an estimated heritability of 34% [9], and the five personality domains have been shown to have a heritability of between 41–61% [22], future research directions will involve multivariate analyzes to assess how genes and the environment contribute to the intriguing interaction between female coital orgasmic frequency and personality.

### Conclusion

In summary, this study of a large unselected female population has shown that specific personality subtypes, such as introversion, emotional instability, and not being open to new experience, appear to be significant risk factors for orgasmic infrequency. These new findings highlight the need for further basic research into female sexual function so that fundamental principles governing female sexuality can be understood, and applied clinically.

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**Appendix: Ten-Item Personality Index (TIPI)**

Subjects were asked how much they agreed or disagreed with each of the ten personality traits using the seven-point Likert scale described below [21].

	Agree strongly	Agree moderately	Agree a little	Neither agree nor disagree	Disagree a little	Disagree moderately	Disagree strongly
	1	2	3	4	5	6	7

- I see myself as:
1.  Extraverted, enthusiastic.
  2.  Critical, quarrelsome.
  3.  Dependable, self-disciplined.
  4.  Anxious, easily upset.
  5.  Open to new experiences, complex.
  6.  Reserved, quiet.
  7.  Sympathetic, warm.
  8.  Disorganized, careless.
  9.  Calm, emotionally stable.
  10.  Conventional, uncreative.

TIPI scale scoring ("R" denotes reverse-scored items): Extraversion: 1, 6R; Agreeableness: 2R, 7; Conscientiousness: 3, 8R; Emotional Stability: 4R, 9; Openness to Experiences: 5, 10R.  
 The Likert scale used in this study is in the opposite direction to that used in the cited journal. However, this scale was reversed during the analysis, and scored according to the cited journal.