

SEXUAL DREAM EXPERIENCING AND PERSONALITY DISORDER FUNCTIONING STYLES IN FREQUENT SEXUAL DREAMERS

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SUMMARY

Background: Sex-related disturbance including sexual dreams contributes to psychiatric disorders, but whether personality disorder functioning styles are linked with sexual dreams especially in frequent dreamers remains unsettled

Subjects and methods: One hundred and seventy one healthy volunteers (controls) and 81 frequent sexual dreamers (fsDreamers) were invited to answer the Sexual Dream Experience Questionnaire (SDEQ) and the Parker Personality Measure (PERM).

Results: Compared to controls, fsDreamers scored significantly higher on SDEQ Joyfulness, Familiarity, Bizarreness and the annual frequency, and on all PERM styles except Schizoid and Obsessive-Compulsive. Sexual dream contents were associated with Borderline, Histrionic and Narcissistic styles in controls, and with Paranoid, Schizotypal, Borderline, Histrionic, Avoidant, and Passive-Aggressive styles in fsDreamers.

Conclusions: Personality involvement in etiology of sexual dreams has been illustrated by the elevated sexual experience and personality disorder functioning style scores and their prominent inter-correlations, especially in frequent sexual dreamers.

Key words: dream frequency - dream measure - personality disorder functioning style - sexual dream experience

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INTRODUCTION

The characteristics of sexual crimes were significantly involved in general delinquency of young people (Akakpo & Burton 2014). Relevant literature showed that sexual crimes were influenced by factors such as the heightened sexual drive, serious sexual fantasies, and sexual behavior problems (Leitenberg & Henning 1995, Burton 2000, Cale & Lussier 2011). Intriguingly, those factors might be associated with sexual dreams, which fits into the continuity hypothesis of dreaming (Domhoff 1999). Sexual dreams are frequent, for instance, it contributed 8.2% to all dreams (Zadra 2007), and its prevalence among college students reached up to 66.4% in America, 68.2% in Japan (Griffith et al. 1958), 76.5% in Canada (Nielsen et al. 2003), 86.7% in Germany (Schredl et al. 2004), and 70.1% in China (Yu 2008).

Yet, the exact etiology of sexual dreams is not fully known. Previous studies have shown that the sexual dream content included various sexual activities and fantasies (Schredl et al. 2009), and such dream might

mirror diurnal sexuality, such as the sexual needs, concerns, and experiences that individuals thought, watched, and acted (Zadra 2007). The latent sexual motives, unaware sexual variation, and bizarre behavior deviating from diurnal sexuality were also reported in dreams (Yu & Fu 2011). Further, according to psychoanalysts, sexual dreams were the fruit of our daytime desires, and it might represent some forms of sexual repression (Freud 1900, reprinted 1953). For instance, sexuality was repressed and unacceptable in some cultures, but it would appear more frequently during dreaming. Moreover, sexual dream, normally as a positive expression of sexuality (Zadra 2007), was reported by some women as complement to diurnal sexuality (Kinsey et al. 1959), and nearly three-fourths of people felt satisfied after their sexual dreams (Gutiérrez-Puertas et al. 2017; Younis et al. 2017). However, a recent study revealed that only 37.5% sexual dreams were judged emotionally positive (Geißler & Schredl 2019). In clinics, deviant sexual dreams are one of the sleeping problems seriously affecting the quality of life. Men with severe chronic psychoses reported higher involvement in sexual

dreams and autoerotic sexuality than women did (Raja & Azzoni 2003).

Although sexual dreams were strongly linked to sexuality of waking life, individuals with frequent diurnal sexuality did not experience more sexual dreams (Yu 2012). The frequency of sexual dreams was positively associated with sexual fantasies during wakefulness but not with the behavior of intercourse or masturbation (Schredl et al. 2009). The content of sexual dreams was related to the pornography viewing (Yu 2012). In addition, sexual dreams were measured as a part of sexual fantasy in Wilson Sex Fantasy Questionnaire (Wilson 1988). Meanwhile, as an important dimension of sexuality, sexual fantasy is affected by personality via several aspects of sexual experience (Leitenberg & Henning 1995). Moreover, women possessing nonconformist, independent, impulsive and aggressive traits reported more sexual fantasies (Hariton 1973).

In clinics, Cluster B personality disorders (i.e., the antisocial, borderline, histrionic, and narcissistic types) were associated with the level and frequency of sexual fantasies, and Cluster A personality disorders (i.e., the paranoid, schizoid, and schizotypal types) were negatively with the intimate sexual fantasies (Vilar et al. 2016). Patients with borderline personality disorder experienced more sexual boredom and disappointment which resulted in further exploration of sexuality (Neeleman 2007). Sexual fantasies were correlated with permanent narcissistic personality traits, which tentatively drove sexual permissiveness (Carabellese et al. 2011; Zara & Özdemir 2018). Sexual impulsivity was frequently seen in borderline personality disorder patients (Neeleman 2007), and sexual sadism in sex offenders was highly associated with the sadistic personality disorder style (Berner et al. 2003; Hill et al. 2006). The sexual sensation seeking was associated with the sexual boredom and some personality disorder traits such as the borderline type (Bench & Lench 2013; Northey et al. 2016). The high sexual sensation seeking led to low social conformity and high sexual risk behaviors such as having unprotected anal sex and multiple sexual partners, which facilitated sexual crimes (Bogaert 1996; Skovran et al. 2010; Oshri et al. 2013). Furthermore, individuals with psychoticism reported more symbolic and hidden dreams with sexual content (Lang & O'Connor 1984). The narcissism and psychopathy traits predicted the frequency of sexual dreams (Lyons et al. 2018), and agreeableness was negatively associated with sexual dreams (Malinowski 2015). We therefore speculate that the association between personality and sexual dream is clearer when personality disorder functioning styles are studied in frequent sexual dreamers.

Regarding the measure of personality disorder, both Structured Clinical Interview for DSM-IV Axis II (SCID-II, First et al. 1994) and Personality Diagnostic Questionnaire (PDQ-4+, Hyler 1994) offer clinical

descriptions of disordered personality domains, but they are not structure-validated scales. The Parker Personality Measure (PERM, Parker & Hadzi-Pavlovic 2001) on the other hand, offers scales of 11 personality functioning styles with the refined dimensions and first-level clinical descriptions, which is a structure-validated tool fitting into the five-factor model of personality (Wang et al. 2003). For sexual dream measures, the Typical Dream Questionnaire might be used, but it has only one item measuring the sexual experience (Zadra & Nielsen 1997); another scale is the Yu-Fu sexual dream questionnaire (Yu & Fu 2011) which contains the sexual objects, ejaculation frequencies during sleeping, and detailed dream descriptions. Unlike these two, the Sexual Dream Experience Questionnaire (SDEQ; Chen et al. 2015) is a comprehensive and structure-validated one, which contains a scale measuring sexual dream frequency, and four scales of joyfulness, aversion, familiarity and bizarreness.

In the current study, we would like to apply PERM and SDEQ in healthy volunteers and frequent sexual dreamers. We have hypothesized that: 1) frequent sexual dreamers score higher on almost all SDEQ scales including sexual dream frequency, and on most PERM styles, especially Clusters A and B types than the healthy volunteers do; and 2) the frequency and scales of sexual dream experience are associated with personality disorder functioning styles of Clusters A and B, especially in frequent sexual dreamers. Our study was conducted in young people, given that they had better sexuality education (Synovitz et al. 2002) and experienced more frequent sexual dreams (Nielsen et al. 2003).

SUBJECTS AND METHODS

Participants

Two hundred and fifty two students were recruited in this study, including 171 healthy volunteers (controls, 127 men and 44 women; mean age, 21.01 years with 2.34 S.D., age range, 17 - 26 years), who had 1 - 3 clearly remembered sexual dreams annually in recent years, and 81 frequent sexual dreamers (fsDreamers, 65 men and 16 women; mean age, 20.91 ± 1.84 , age range, 18 - 26), who had experienced at least three sexual dreams per month in recent years. There were no significant differences between the two groups as to gender ($\chi^2 = 1.08$, $df = 1$ $p = .30$) or age ($t = -.35$, $p = .73$). All participants were confirmed to have no prior history of severe psychiatric disorders such as schizophrenia, nor sexual dysfunctions or paraphilic disorders, nor other organic brain or physical lesions severely impairing sexual functioning, and to be free from alcohol or drugs, according to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5) criteria (American Psychiatric Association 2013) by an experienced psychiatrist. Participants were

abstained from pornographic materials or masturbation for at least 72 hours prior to testing. The study protocol was approved by a local ethics committee, and all participants gave their written informed consents (guardians signed written informed consent for the young adolescents).

Questionnaires

Participants were asked to complete following two paper questionnaires in a quiet room, using a 5-point Likert-type scale: 1 (very unlike me), 2 (moderately unlike me), 3 (somewhat like and unlike me), 4 (moderately like me), and 5 (very like me). The internal reliabilities of two questionnaires in the current study are illustrated in Table 1.

The Sexual Dream Experience Questionnaire (SDEQ)

The SDEQ (Chen et al. 2015) consists of one item to measure the sexual dream frequency and 32 items measuring four aspects: Joyfulness, Aversion, Familiarity, and Bizarreness, and each aspect has eight items. Joyfulness describes sexual excitement, happiness and satisfaction towards their dreams; Aversion contains rejections of sexual behavior, and feelings of embarrassment, shame and discomfort; Familiarity includes a pleasant thing, a familiar people or place in dreams, and Bizarreness touches up abnormal sexual behaviors such as rife with violence, rape, and animals.

The Parker Personality Measure (PERM)

The PERM (Parker & Hadzi-Pavlovic 2001) is a self-rating questionnaire measuring 11 types of personality disorder functioning styles. It comprises 92 items under personality styles of the paranoid, schizoid, schizotypal, antisocial, borderline, histrionic, narcissistic, avoidant, dependent, obsessive-compulsive, and passive-aggressive types. The questionnaire has been validated in Chinese culture (Wang et al. 2003).

Statistical Analyses

Two-way ANOVA was applied to the mean SDEQ and PERM scale scores in the two groups of participant. Whenever a significant main effect was found, the post-hoc Student t test was used to evaluate between-group differences. The annual frequency of sexual dreams in the two groups was also evaluated by the Student t test. The effect size (Cohen's d) was also calculated for comparison. The Pearson's partial correlation analysis was employed to evaluate the relationships between SDEQ and PERM scale scores. In addition, multiple linear regression analyses (stepwise method) were used to seek for further relationships between SDEQ (including the annual frequency) and PERM scales, taking the PERM styles as predictors. Considering the possible confounding effects of gender and age (Chen et al. 2015; Younis et al. 2017), we controlled them in the correlation and regression analyses. In order to reduce the probability of Type I error, the absolute r and beta values were set at >0.30. A p value <0.05 was considered as significant.

Table 1. Scale internal reliabilities (n = 252) and scores (means ± S.D.) of the Sexual Dream Experience Questionnaire (SDEQ) and the Parker Personality Measure (PERM) in healthy volunteers (Controls, n = 171) and frequent sexual dreamers (FsDreamers, n = 81).

	Internal reliability	Controls	FsDreamers	95% Confidence Interval	Cohen's d
SDEQ					
Joyfulness	.88	18.39 ± 7.06	21.88 ± 7.66*	1.56 ~ 5.41	.47
Aversion	.86	13.09 ± 5.18	13.49 ± 5.94	-1.04 ~ 1.85	.07
Familiarity	.78	22.28 ± 6.07	26.69 ± 6.65*	2.75 ~ 6.07	.68
Bizarreness	.83	10.45 ± 3.69	13.48 ± 6.16*	1.56 ~ 4.50	.55
Annual frequency		2.04 ± .79	35.33 ± 44.85*	23.38 ~ 43.22	.90
PERM					
Paranoid	.82	21.08 ± 7.10	23.23 ± 5.87*	.48 ~ 3.83	.34
Schizoid	.47	19.77 ± 3.97	19.16 ± 4.14	-1.68 ~ .46	-.15
Schizotypal	.69	9.80 ± 3.39	10.77 ± 3.99*	.01 ~ 1.92	.26
Antisocial	.73	20.26 ± 5.51	21.91 ± 6.09*	.14 ~ 3.17	.28
Borderline	.79	19.54 ± 5.99	21.75 ± 7.09*	.52 ~ 3.90	.33
Histrionic	.66	12.27 ± 3.63	14.35 ± 3.92*	1.09 ~ 3.07	.54
Narcissistic	.78	16.92 ± 5.46	19.35 ± 5.40*	.98 ~ 3.87	.45
Avoidant	.80	24.78 ± 6.48	26.64 ± 7.34*	.07 ~ 3.66	.26
Dependent	.75	21.46 ± 5.92	23.53 ± 6.04*	.49 ~ 3.66	.35
Obsessive-Compulsive	.59	16.65 ± 4.16	16.65 ± 3.72	-1.06 ~ 1.07	.00
Passive-Aggressive	.66	19.81 ± 5.01	22.58 ± 5.04*	1.44 ~ 4.11	.55

Note: * p < .05 vs. Controls.

Table 2. Correlation between the Sexual Dream Experience Questionnaire (SDEQ) and the Parker Personality Measure (PERM) styles (controlling gender and age) in healthy volunteers (Controls, n = 171) and frequent sexual dreamers (FsDreamers, n = 81).

PERM styles	Controls					FsDreamers				
	Joyfulness	Aversion	Familiarity	Bizarreness	Annual frequency	Joyfulness	Aversion	Familiarity	Bizarreness	Annual frequency
Paranoid	.28*	.18*	-.01	.25*	-.02	.02	.09	-.07	.07	-.08
Schizoid	.05	.01	-.04	.00	-.12	.12	.06	.10	.12	.21
Schizotypal	.12	.21*	-.09	.12	-.13	.38*	.19	.06	.31*	.20
Antisocial	.20*	.16*	-.06	.25*	-.08	.20	.02	.05	.24*	.08
Borderline	.14	.27*	-.15*	.29*	-.06	.32*	.23*	.00	.31*	.07
Histrionic	.26*	.18*	.15	.35*	.06	.35*	.08	.05	.19	-.04
Narcissistic	.32*	.13	.15*	.28*	.05	.23*	-.01	.01	.15	.05
Avoidant	.13	.24*	-.05	.05	-.02	.37*	.17	.01	.22	.05
Dependent	.19*	.24*	-.08	.24*	-.04	.30*	.29*	.05	.24*	.09
Obsessive-Compulsive	.19*	.10	.14	.05	-.03	.04	-.11	.03	.07	-.10
Passive-Aggressive	.22*	.09	.03	.18*	-.08	.37*	.12	.13	.29*	.26*

Note: * $p < .05$; and $|r|$ s more than .30 were bolded for clarity.

RESULTS

The mean SDEQ scale scores were significantly different between the two groups (group effect, $F [1, 250] = 31.16, p < .001$, mean square effect (MSE) = 1764.76; scale effect, $F [3, 750] = 265.83, p < .001$, MSE = 7627.85; group \times scale interaction effect, $F [3, 750] = 5.65, p < .001$, MSE = 162.01). Subsequent post-hoc Student t test analysis showed that fsDreamers scored significantly higher than controls did on Joyfulness ($t = 3.56, p < .001$), Familiarity ($t = 5.22, p < .001$) and Bizarreness ($t = 4.10, p < .001$). FsDreamers also scored significantly higher on the annual frequency ($t = 6.68, p < .001$) (Table 1).

The mean PERM style scores were significantly different between the two groups (group effect, $F [1, 250] = 9.50, p < .01$, MSE = 1546.49; scale effect, $F [10, 2500] = 282.22, p < .001$, MSE = 4254.60; group \times scale interaction effect, $F [10, 2500] = 4.05, p < .001$, MSE = 61.00). Subsequent post-hoc Student t test analysis detected that fsDreamers scored significantly higher than controls did on Paranoid ($t = 2.54, p < .05$), Schizotypal ($t = 1.99, p < .05$), Antisocial ($t = 2.15, p < .05$), Borderline ($t = 2.57, p < .05$), Histrionic ($t = 4.14, p < .001$), Narcissistic ($t = 3.30, p < .001$), Avoidant ($t = 2.04, p < .05$), Dependent ($t = 2.58, p < .01$), and Passive-Aggressive ($t = 4.10, p < .001$) styles (also see Table 1).

In controls, the SDEQ Joyfulness was significantly correlated with Narcissistic ($r = .32, p < .01$), and Bizarreness with Histrionic ($r = .35, p < .01$). In fsDreamers, Joyfulness was significantly correlated with Schizotypal ($r = .38, p < .001$), Borderline ($r = .32, p < .01$), Histrionic ($r = .35, p < .01$), Avoidant ($r = .37, p < .001$) and Passive-Aggressive ($r = .37, p < .001$), and Bizarreness with Schizotypal ($r = .31, p < .01$) and Borderline ($r = .31, p < .01$) (Table 2).

Considering the prediction of SDEQ scales (and the

annual frequency) by PERM styles, the adjusted R^2 were ranged from .07 to .14 in controls, and from .07 to .38 in fsDreamers. In controls, the Narcissistic style ($\beta = .31; p < .001$) predicted the Joyfulness, Borderline ($\beta = -.37; p < .001$) and Histrionic ($\beta = .32; p < .001$) together the Familiarity, and Histrionic ($\beta = .34; p < .001$) the Bizarreness. In fsDreamers, Passive-Aggressive ($\beta = .32; p < .01$), Paranoid ($\beta = -.51; p < .001$) and Histrionic ($\beta = .35; p < .01$) styles predicted the Joyfulness, Schizotypal ($\beta = .34; p < .01$) the Bizarreness, and Passive-Aggressive ($\beta = .43; p < .001$) the annual frequency (Table 3).

DISCUSSION

Confirming most of our two hypotheses, fsDreamers scored higher on SDEQ Joyfulness, Familiarity, Bizarreness and the annual frequency of sexual dreams, and on all PERM styles except Schizoid and Obsessive-Compulsive than healthy volunteers did; the SDEQ scales were associated with Borderline, Histrionic and Narcissistic styles in controls, and with Paranoid, Schizotypal, Borderline, Histrionic, Avoidant, and Passive-Aggressive styles in fsDreamers. It is the first study focusing on the relationships between sexual dream experiences and personality disorder functioning styles in frequent sexual dreamers. Emotional experiences and main concerns of waking life were more likely to appear in dreams (Nikles II et al. 1998; Malinowski & Horton 2014), including sexual dreams. Frequent sexual dreams were linked with dreamers' greater use of pornography or sexual media, which might lead to excessive sexual fantasies (Schredl et al. 2009; Yu 2012; van den Bulck et al. 2016). Individuals recalling frequent dreams tended to be interested in dreams and held optimistic attitudes towards them (Schredl, 1999), which explained our finding that fsDreamers scored higher on Joyfulness.

Table 3. Stepwise multiple regressions predicting the Sexual Dream Experience Questionnaire (SDEQ) scales by the Parker Personality Measure (PERM) styles (controlling gender and age) in healthy volunteers (Controls, n = 171) and frequent sexual dreamers (FsDreamers, n = 81).

	Controls		FsDreamers	
	Adjusted R2	β (B, Standard Error) predictors	Adjusted R2	β (B, Standard Error) predictors
Joyfulness	.14	.31 (.40, .09) Narcissistic* -.21 (-3.41, 1.15) gender*	.38	.32 (.49, .17) Passive-Aggressive* -.51 (-.67, .15) Paranoid* .35 (.69, .22) Histrionic* .28 (.54, .22) Schizotypal* -.20 (-.84, .38) gender*
Aversion	.10	.27 (.23, .06) Borderline* -.18 (-.40, .16) age*	.07	.28 (.28, .11) Dependent*
Familiarity	.11	-.37 (-.38, .09) Borderline* .32 (.54, .15) Histrionic* .16 (.23, .11) Obsessive-Compulsive*	--	--
Bizarreness	.11	.34 (.34, .07) Histrionic*	.10	.34 (.52, .16) Schizotypal*
Annual frequency	.07	-.28 (-.51, .13) gender*	.12	.43 (4.11, 1.16) Passive-Aggressive* -.30 (-2.45, 1.00) Paranoid*

Note: * $p < .05$; $|\beta|$ s more than .30 were bolded for clarity; and Bs were unstandardized coefficients.

Meanwhile, the higher Familiarity in fsDreamers was in line with the continuity hypothesis of dreaming that there is considerable continuity between dream content and waking life (Domhoff 1999). A study showed that dream bizarreness facilitated dream recalling (Cipolli et al. 1993), which was in line with that our fsDreamers had higher Bizarreness.

In fsDreamers, the higher PERM Paranoid was in accordance with that dream produced diverse delusions and paranoid suspiciousness, which were manifested in paranoid personality disorder (Yu 2009; Mason & Wakerley 2012), and that individuals with deviant sexual fantasies had more paranoid features than those without (Curnoe & Langevin 2002). Their higher Schizotypal style were in accordance with that individuals remembering more frequent dreams scored higher on schizotypal proneness (Parra 2014) and schizotypal personality trait (Watson 2003). In addition, fsDreamers reported higher Antisocial and Narcissistic styles in our study, which was consistent with previous results that sexual dream frequency was positively associated with antisocial and narcissistic traits (Yu 2014; Lyons et al. 2018).

In view of the strong connection between sexual dreams and sexual fantasies (Schredl et al. 2009), previous outcomes that psychiatric patients with cluster B personality disorders had higher sexual fantasies (Vilar et al. 2016) supported our results that fsDreamers scored higher on Borderline and Histrionic styles. There were some studies showing that both sexual excitement in dreams and frequency of dream recalling were positively related to anxiety (Tart 1962; Henton 1976), and that anxiety is a common feature of avoidant and dependent personality disorders (APA 2013), which supported our results that fsDreamers had higher Avoidant and Dependent styles. Moreover, anxiety was

related to passive-aggressive personality disorder (Lilienfeld & Penna 2001), which helped explain that fsDreamers scored higher on Passive-Aggressive style in our study.

In our controls, Narcissistic was associated with Joyfulness, which corresponded to the findings that narcissism was associated with sexual dreams (Lyons et al. 2018) and the interest in short-term sexual relationships (Jonason et al. 2012). Borderline was negatively associated with Familiarity, which might be due to that people with borderline personality trait have shown various cognitive distortions (Skrzypińska & Szmigielska 2015), thus might have poor alignment with reality (APA 2013). Histrionic was associated with Familiarity, which might be due to that the histrionic personality disorder patients often show sexually provocative and seductive behaviors in daily interactions (APA 2013). In addition, the association between Histrionic and Bizarreness might be supported by the clinical features of histrionic personality disorder patients that they often prefer exciting and novel stimulation in their daily routine (APA 2013), and that they were more likely to experience sexual dating violence (Monson & Langhinrichsen-Rohling 2002) and have compulsive sexual behavior (Black et al. 1997). In our fsDreamers, Paranoid was negatively associated with Joyfulness, which was in line with that individuals with paranoia recalled more negative instead of positive affect, i.e., fear of threats from other people (Greer et al. 2016). Schizotypal was associated with Joyfulness, which was supported by that schizotypal individuals were inclined to enjoy their dream experiences (Claridge et al. 1997). Borderline was associated with Joyfulness, which might result from that borderline patients had high level of fantasy associated with positive dream emotions (Simor et al.

2010; Vilar et al. 2016), and with their ability to experience sexual orgasm and pleasure (Coen 1978). Meanwhile, histrionic women sometimes experience marital dissatisfaction and sexual boredom, but have increased emotional needs, sexual fantasies and preoccupations, and sexualities full of excitement and novelty, especially during extramarital sexual affairs (Apt & Hurlbert 1994; Vilar et al. 2016). These clinical features might be linked with their dreams, and support that Histrionic was associated with Joyfulness found in our study.

Literature in addition, show that there were relationships - among anxiety, sexual excitement in dreams, and avoidant personality, (Henton 1976), which supported our results that Joyfulness was associated with Avoidant style, and similarly supported that Joyfulness was associated with Passive-Aggressive style in our fsDreamers (Lilienfeld & Penna 2001). Schizotypal was associated with Bizarreness, which agreed with that schizotypal personality was strongly associated with sexual abuse in childhood (Velikonja et al. 2019), and that schizotypal patients have odd beliefs, bizarre fantasies and eccentric behaviors (APA 2013). Borderline was associated with Bizarreness, which was supported by that borderline personality was predicted by more sexual violence, primarily in women (Vanwoerden et al. 2019), and that borderline patients experienced more sexual abuse (de Aquino Ferreira et al. 2018). In our fsDreamers, Passive-Aggressive was associated with annual frequency, which might be resulted from that passive-aggressive personality disorder was related to anxiety (Lilienfeld & Penna 2001), and anxiety was related to frequency of dream recalling (Tart 1962).

However, there are some design flaws in the current study. Firstly, all participants are youngsters, thus whether the current results can be generalized to other age groups remains unknown. Secondly, the sexual dream experience measures are subject to recall bias, which might be influenced by memory functions. Thirdly, we have not included personality disorder patients or sexual offenders as our controls, where the relationship between deviant sexual dreams and extreme personality traits might be clearer. Fourthly, our study is cross-sectional, hence we cannot establish any causal explanations of personality for sexual dreams. Nevertheless, we have found elevated scores of sexual experience scales and personality disorder functioning styles, and their prominent associations in frequent sexual dreamers. Considering that sexual dreams and interests and bizarreness in unusual dreams were positively associated with anxiety in college women (Henton 1976), and with the psychological distress and behavior problems in adolescent people (Soffer-Dudek & Sadeh 2013), our results might offer evidence of personality contributions to the etiology of sexual dreams.

CONCLUSION

Personality involvement in etiology of sexual dreams has been illustrated by the elevated sexual experience and personality disorder functioning style scores and their prominent inter-correlations, especially in frequent sexual dreamers.

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Contribution of individual authors:

Wei Wang conceived the study,
Yanli Jia, Xu Shao and Chu Wang conducted the tests and collected the data,
Yanli Jia analyzed the data,
Yanli Jia and Wei Wang drafted the manuscript.

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