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### Abstract

The classification of sexual fantasies and behaviors (here referred to as 'sexual interests') has historically been divided into 'paraphilic' and 'normophilic'. However, studies on paraphilic interests are often limited to clinical or forensic samples and normophilic interests are rarely assessed in tandem. Previous research has found mixed results for psychological and other correlates of sexual interests, potentially due to inconsistency in operationalism and measurement of fantasies and behaviors. The aim of the current study was to quantify correlates of sexual interests via the Sexual Fantasies and Behaviors Inventory, containing factors related to general fantasies/behaviors, normophilia, power dynamics, sadomasochism, and courtship paraphilias, using a large ( $N= 4,280$ ) non-clinical sample. Psychological, developmental, sexual, and demographic correlates were investigated via bivariate correlations, mean difference testing, and multiple regression. Sexual interest domains were largely unrelated to psychopathology and developmental factors. Sociosexuality and more accepting attitudes towards sadomasochism was generally related to more arousal to/engagement in normophilic and paraphilic domains. More autism spectrum disorder (ASD) traits were related to decreased normophilic interests. Psychopathic traits, sexual sensation seeking, and sexual compulsivity were related to paraphilia dimensions, especially courtship paraphilias and domination/sadism; the former was also associated with negative attitudes about establishing consent. Men, non-monogamous, and non-heterosexual participants indicated greater sexual fantasies and behaviors compared to women (except in the case of submission and masochism), monogamous, and heterosexual participants, respectively.

**Keywords:** paraphilias, sexual interests, personality, sexual behaviors

## **Psychological, Developmental, Sexual, and Demographic Correlates of Paraphilic and Normophilic Sexual Interests**

The description and measurement of cognitive and behavioral aspects of sexuality varies considerably; this is particularly true with the classification of sexual interests. Inconsistent operationalism and classification can result in conflicting results and interpretations of findings across studies, limiting the ability to accurately consolidate existing knowledge in this field. We aim to investigate two dimensions of sexuality, sexual fantasies and sexual behaviors, and their psychological, developmental, sexual, and demographic correlates using validated measures and more robust scoring techniques to address such issues and add to the current literature on the relationship between sexual interests and external variables.

### **Sexual Interests**

Sexual interests are currently defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association [APA], 2013) as sexual fantasies, urges, and behaviors. For this study, sexual interests will be operationalized as 1) sexual fantasies and 2) sexual behaviors. Concordance of sexual fantasies and behaviors may differ based on the sexual interest content, the desire to engage in a behavior (e.g., rape fantasies without the desire to ever act them out), relative possibility of engaging in the behavior (e.g., lack of opportunity), or personal or social concerns; it may also be influenced by factors such as sex drive or gender (Seto et al., 2021). Generally, the presence of more sexual fantasies and arousal predicts more sexual behavioral engagement (Walton et al., 2016). Sexual interests have historically been divided into two categories: normal and abnormal. However, terminology has fluctuated significantly, as have the definitions, attached stigma, and cultural understanding.

### **Choosing Terminology**

#### **Paraphilia vs Normophilia**

The most consistently used term to describe the “abnormal” has been paraphilia, first introduced in the early 1900s (Moser & Kleinplatz, 2020; Robertson, 1913). In the DSM-5, paraphilic interests are any sexual interests that fall outside of the definition of normophilic interests: “genital

stimulation or preparatory fondling with phenotypically normal, physically mature, consenting human partners” (p. 685, APA, 2013). Unlike paraphilic interests and paraphilias, paraphilic disorders require significant distress or impairment (and that distress/impairment is not due to the social stigmatization of the sexual interest), or that the behavior has been acted on with nonconsenting parties. The ICD-11 differs in that it does not specify these differences nor does it refer to ‘normophilia’. It defines paraphilic disorders as “persistent and intense patterns of atypical sexual arousal, manifested by sexual thoughts, fantasies, urges, or behaviors, the focus of which involves others whose age or status renders them unwilling or unable to consent and on which the person has acted or by which he or she is markedly distressed” (World Health Organization, 2019). What is considered “atypical” and “persistent” is not well operationalized.

### **Deviant vs Non-deviant**

Defining sexual interests as deviant or non-deviant is largely limited to criminal and forensic psychiatric literature. In this context, deviant sexual interests are often operationalized as requiring nonconsenting parties, such as children, animals, or nonconsenting adults. Additionally, some studies (van Bommel et al., 2018) equate sexual deviancy with paraphilic disorders despite the APA’s (2013) clarification that sex offenders do not de-facto have a paraphilic disorder.

### **Atypical vs Typical**

‘Atypical’ has long been used to describe paraphilias, with unclear delineation between ‘atypical’ and ‘paraphilic’ or the terms being used synonymously (e.g., (Paquette et al., 2022)). Terms that assume some sort of statistical norm are likely to be less useful in the description of sexuality, given that 1) evidence has continued to show that many of the sexual interests colloquially labelled as “atypical” are neither atypical nor rare sexual interests (Joyal & Carpentier, 2017; Joyal et al., 2015; Richters et al., 2008), 2) true prevalence rates are difficult to determine, and 3) prevalence of fantasies and parallel behaviors may differ considerably (e.g., rape fantasies vs role-playing rape).

### **Normative vs Non-normative**

“Non-normative” may be less stigmatizing; this also avoids the statistical implications of “atypical” or “unusual”. However, non-normative, by definition, is based on cultural standards or

norms. Sexual interests have been viewed differently based on historical zeitgeist and cultural differences (Bhugra et al., 2010). Thus, defining specific sexual interests as non-normative guarantees that this definition will vary by time and place, losing scientific meaning and accuracy.

### **Terminology to be Used in the Current Study**

We have chosen to adopt the APA DSM-5 definition of ‘paraphilic’ and ‘normophilic’ sexual interests for three primary reasons. First, they do not rely on the statistical model of “typical” and “atypical”, as it is difficult to determine true prevalence rates. Second, the operational definitions provided does not rely on current cultural acceptance (like non-normative) or imply possible criminality (like deviant). Third, they do not rely on implied or individual understanding (like “kink”), and, taken together, the DSM-5 definitions of ‘paraphilic’ and ‘normophilic’ are inclusive of all potential sexual interests. Thus, for this study, normophilic interests will be any sexual interest (meaning fantasy or behavior) that involves genital stimulation or preparatory fondling with phenotypically normal, physically mature, consenting human partners, and paraphilic interests will be any fantasies or behaviors that fall outside of this. We recognize the potentially stigmatising nature of these terms; here they are employed for categorization, not diagnostic, purposes. The aim of this study was to investigate the correlates of both paraphilic and normophilic sexual interests in a large non-clinical sample. Results pertain to paraphilic interests more generally, rather than paraphilic disorders specifically.

### **Correlates of Paraphilic Interests**

Much of the literature on paraphilic interests, especially in clinical or forensic populations, pertain to the eight paraphilias listed in the DSM-5: voyeurism, exhibitionism, frotteurism, sexual masochism, sexual sadism, pedophilia, fetishism, and transvestism. There has been growing scientific interest in other paraphilic interests, such as those pertaining to BDSM, novel fetish objects, and roleplaying within different power dynamics (e.g., age/pet play). Paraphilic interests often co-occur, in both clinical (i.e., those with paraphilic disorders or presenting with distress; (Seto et al., 2014) and non-clinical (usually community) samples (e.g., (Joyal & Carpentier, 2017; Seto et al., 2021). Frotteurism, voyeurism, and exhibitionism, also known as the ‘courtship disorder’ paraphilias, are

thought to have the highest rate of co-occurrence and are responsible for a large portion of sexual offending (APA, 2013). Originally, 'paraphilic coercive disorder', a paraphilia that is a preference for non-consenting sexual partners and may also co-occur with other courtship paraphilias, was also proposed as being a courtship disorder (Freund & Blanchard, 1986), but this has been rejected from DSM-5 and ICD-11 paraphilic disorders (although coercive sexual sadism is similar) due in part to the assertion that sexual offenders do not de-factor have a psychiatric disorder (Knight, 2010). Co-occurrence may also be influenced by sex differences, with studies generally finding higher co-occurrence (and overall occurrence) of paraphilic interests in men than women (Bártová et al., 2020; Baur et al., 2016). Relationships between paraphilic interests and external correlates differ based on whether the sample is from populations with paraphilic-associated distress/offending (clinical samples) or from the community (non-clinical) with lower levels of paraphilic- or sex-related distress.

### **Psychological Correlates**

There have been some studies that demonstrated the relationship between paraphilic sexual interests and psychopathology, especially in clinical samples. Evidence suggests courtship disorders, especially exhibitionism, are related to poor socialization, compulsive sexual behavior, behavioral inhibition, and hypersexuality (Clark et al., 2014; Långström & Seto, 2006; Thomas et al., 2021). Models of sexual sadism disorder also show that psychopathic traits, behavioral disinhibition, and affective deficits are precursors to sexually sadistic behavior (Mokros et al., 2011). This links to Dark Triad traits (psychopathy, Machiavellianism, and narcissism) which have been found to be related to both clinical (Woodworth et al., 2013) and non-clinical paraphilic interests (Baughman et al., 2014; Watts et al., 2017), with psychopathic traits being the most consistent predictor of the three, though it was more linked with sadistic paraphilic interests, such as bondage and sadism. However, studies varied in measurement of sexual interests (e.g., the Wilson Sex Fantasy Questionnaire vs the Multidimensional Assessment of Sex and Aggression), sampling (e.g., BDSM practitioners, people who have sexually offended, university students) and findings. Other studies (Lodi-Smith et al., 2014) were unable to replicate these findings. Dark personality traits were shown to be related to sexual motivations in non-paraphilic samples, with one study on the Dark Tetrad showing that

Machiavellianism was the strongest, most consistent predictor of seven of 10 sexual motivations and goals, suggesting links with dark personality features may not be driven by paraphilic interests specifically (Smith et al., 2019). However, studies using community samples have not typically found *clinical* levels of Dark Triad traits related to paraphilic interests. Testing the predictive ability of dark triad traits on different domains of paraphilic and normophilic interests in regression models may provide better insight into relationships between fantasies, behaviors, and dark personality features.

There may also be links to disgust sensitivity, a dispositional proneness to negative emotional reactions to repulsive stimuli, though this has not yet been robustly tested in those with paraphilic interests. One study linked 'darker' traits, especially everyday sadism and psychopathy, to decreased disgust sensitivity (Meere & Egan, 2017). Given the plausible links between paraphilic interests and Dark Triad traits and the types of stimuli or consequences involved in many paraphilic interests (e.g., damage to body through bruises/cuts, etc.), it is possible lower disgust sensitivity is related to increased arousal to or engagement in paraphilic interests, especially those with Dark Triad links.

In regard to other personality features, there is limited evidence for personality *disorder* features in non-clinical paraphilic samples. Some evidence suggests openness to experience and, to a lesser extent, extraversion, are related to BDSM interests, particularly in samples of people frequently engaging in BDSM behaviors (Hébert & Weaver, 2014; Wismeijer & Van Assen, 2013). Similarly, erotophilia (a personality trait describing openness and responsiveness to sexual cues) was found to be related to more positive attitudes towards BDSM in women (Rye et al., 2015). Studies have also found a relationship between paraphilic interests more generally and impulsivity and hypersexuality (Dawson et al., 2016; Kafka & Hennen, 2003). Participation in paraphilic behaviors may also be related to increased sensation-seeking (Dawson et al., 2016); a smaller study reported that those engaging in sadomasochistic activities do so for endorphin 'highs', as demonstrated by increased cortisol and arousal levels (Sagarin et al., 2009).

Trait psychopathy and extraversion (and other Dark Triad traits to a lesser extent) have been linked to sociosexuality, or the inclination towards more and casual sexual activity (Fernández del Río et al., 2019; Semenyna et al., 2018). Higher sociosexuality was related to a broader range of sexual

behavior (Dawson et al., 2016; Zheng & Zheng, 2014), greater sexual arousal (Timmers & Chivers, 2012), more lifetime sexual partners, and higher sex drive (Ostovich & Sabini, 2004). Research also showed increased sex drive was related to broader sexual fantasies and higher engagement in sexual behavior (Baughman et al., 2014; Ostovich & Sabini, 2004), with sex drive mediating the differences between gender and number of paraphilic interests (Dawson et al., 2016), and moderating the relationship between some sexual fantasies and concordant behaviors (Seto et al., 2021).

Where evidence showed a link between psychological distress and paraphilic interests, it was largely in clinical samples or subgroups of paraphilic interest practitioners. Some research found that people with BDSM interests had higher rates of suicidal ideation, especially if they reported a history of abuse (Brown et al., 2017) or mental health difficulties such as borderline personality disorder (Frías et al., 2017), in addition to other risk factors for suicide, such as being LGBTQ+ or having depressive symptoms. Distress (e.g., guilt) related to having paraphilic interests has been found to be associated with increased mental health difficulties (Roche et al., 2020). For example, pedophilic arousal patterns were associated with psychological distress, though whether the distress reached clinical levels was influenced by factor such as age preferences (teleiophilic attraction predicted less distress than pedophilic attraction) and whether or not they had been detected for possible child sexual offenses, again suggesting possible subgroup differences (Konrad et al., 2017). However, a recent systematic review found little relationship between people who fantasize about or practice BDSM and psychopathology (Brown et al., 2020b). Overall, studies that have compared those with non-clinical paraphilic interests to those without paraphilic interests have generally found comparative rates of psychopathology.

Another predictor of paraphilic sexual interests appears to be gender nonconformity and gender-related distress or dysphoria (Fisher et al., 2015). In paraphilias such as autogynephilia and autoandrophilia (sometimes though to be a sub-type of transvestism), where sexual arousal is gained from imagining oneself as being a different gender, this link with gender nonconformity is even stronger (Blanchard, 1993; Brown et al., 2020a). This may be related to autism spectrum disorder (ASD) symptoms; people with ASD or ASD traits have been found to demonstrate more gender



nonconformity, gender dysphoria, and paraphilic sexual interests (e.g., (Brown et al., 2020a; Fernandes et al., 2016; Schöttle et al., 2017).

### **Developmental Correlates**

There is limited evidence for the relationship between developmental correlates and paraphilic interests, of which almost all has come from male samples and are contentious within the literature. For example, neurobiological correlates of pedophilia may include higher rates of left-handedness and lower intelligence (Cantor et al., 2004). Other studies have also found that males with paraphilic interests have greater incidence rates of left-handedness (Rahman & Symeonides, 2008). A recent meta-analysis found support for the birth order effect, such that having more older sisters or brothers increases the odds of males with homosexual paraphilic interests, such as homosexual pedophilic attraction patterns (Blanchard et al., 2020). However, this association may be due more to sexual orientation, as birth order has been found to be related to homosexuality in males (Blanchard, 2018; Kishida & Rahman, 2015). Other potential correlates include parent's age at birth and height/weight, though no current literature has included these.

### **Sexual Correlates**

Similar to psychological correlates, the relationship between paraphilic interest and sex-related variables may help identify subgroups, particularly those who exhibit compulsive sexual behavior in conjunction with paraphilic interests. When sexual interests were related to poorer sexual outcomes this may have been due to hypersexuality (Walton et al., 2017), sexual distress (Roche et al., 2020), or paraphilic interests associated with non-consensual behavior, such as exhibitionism or frotteurism (Castellini et al., 2018; Poinsett, 2015). However, sexual dysfunction or problematic sexual behavior is more associated with hypersexuality than fantasy content (Castellini et al., 2018). Some evidence suggested that people with paraphilic sexual interests had higher rates of STIs and HIV (Moskowitz et al., 2011), though this may be more related to frequency of sexual behaviors rather than the behaviors themselves.

People with non-clinical paraphilic interests appear to have similar, if not better sexual functioning than people who report no paraphilic interests. For example, studies have found that

people engaging in BDSM behaviors have higher sexual satisfaction (Botta et al., 2019; Kimberly et al., 2018), due in part to better sexual communication between partners (Tripodi, 2017). Similarly, a recent study found BDSM to be linked with both sexual and relationship satisfaction (Strizzi et al., 2021). People who reported more sexual fantasies may also report increased sexual satisfaction and sexual functioning (Rathi et al., 2017), suggesting that broadening one's sexual repertoire may be useful for those with sexual dissatisfaction or communication inhibition. Interpersonally, it appears that people with non-clinical paraphilic interests, especially BDSM, have similar rates of dyadic adjustment in intimate relationships (Kimberly et al., 2018; Rogak & Connor, 2017). However, in the cases of rare paraphilic interests (e.g. adult babies/diaper lovers), people report having more relationship problems in regard to finding a partner who shares interests or having discordant levels of that interest (Zamboni, 2018). Those with compatible sexual interests generally report good communication and high relationship satisfaction (Dancer et al., 2006).

### **Demographic Correlates**

Demographically, men consistently report more engagement with and more intense sexual interests than women (Dawson et al., 2016; Joyal & Carpentier, 2017). Overall endorsement rates from both men and women both show an increase over time, with a nationally representative survey of Australia finding that affirmative responses to participating in BDSM increased significantly between two time points (Richters et al., 2014). More non-heterosexual behavior is also related to more diverse sexual interests and sex at an earlier age (Chivers et al., 2014; Richters et al., 2008). Systematic reviews have found people who report engaging in BDSM and other non-clinical, consensual paraphilic behaviors are more likely to be white, well-educated, and follow non-monogamous relationship patterns (e.g., (Brown et al., 2020b). Those diagnosed with paraphilic disorders are almost exclusively males (APA, 2013), and there is little information about demographic features of females with paraphilic disorders.

### **Correlates of Normophilic Interests**

Correlates of normophilic interests are often described in relation to paraphilic interests, such as when people without paraphilic interests are used as a 'control' group. The focus is largely on

prevalence rates rather than correlates outside of demographic variables. Like with paraphilic interests, substantial sex differences emerge for normophilic interests. For example, one large study found that men were more likely to have reported ever having masturbated and having masturbated more recently and more often than women (Richters et al., 2014). Predictors of reporting having masturbated in the previous 12-months included higher education and income, more diverse sexual behaviors (e.g., use of sex toys or anal stimulation), and having more than one sexual partner. People were less likely to have reported masturbation if they had religious affiliation or did not speak English at home, suggesting the potential role of cultural difference in reporting and engaging in certain sexual behaviors. Another study in the US found that women were more likely to have had sex with people of the same gender and that Black men and Hispanic women were less likely than their white counterparts to have reported same-sex partners (Chandra et al., 2011). A similar study in the UK found that men consistently reported more numbers of partners and had higher rates of simultaneous sexual partners; they also reported more sexual risk perception (Johnson et al., 2001). Overall, this suggest important demographic differences based on gender, age, and ethnicity, but information about other potential correlates is limited.

### **The Present Study**

We aim to replicate and extend the known correlates of sexual interests using the Sexual Fantasy and Behavior Inventory (SFBI), which was designed to capture both normophilic and paraphilic interests. The final model of the SFBI suggested that sexual interests as a latent construct were underpinned by a bifactor structure, such that there was a 'general' factor for sexual fantasies and behaviors, with specific factors for normophilic interests, interests related to power exchange (e.g., dominance and submission), and courtship disorders. Scale psychometric and scoring information can be found in Brown et al., 2021. Unlike previous studies, we will simultaneously examine the relationship between external correlates with paraphilic, normophilic, and general sexual fantasies and behaviors. Factor scores were used for the SFBI and external correlates, given the notable issues with relying on sum or average scores (McNeish & Wolf, 2020).

Exploratory variables, for which we have not made specific predictions due to lack of evidence, consistency in findings, or generalisability (e.g., it has only been studied in male sex offenders), include general psychological wellbeing, attitudes towards sexual consent, disgust sensitivity, dyadic communication, childhood gender nonconformity, developmental correlates such as birth order and age of biological parents at birth, history of incarceration, and attendance of sex-related events (e.g., BDSM clubs). Below we detail all confirmatory hypotheses.

#### **Psychological Correlates: Confirmatory Hypotheses**

We predict that, of the Dark Triad traits, psychopathic traits will have the strongest positive relationship with BDSM-related sexual interests, followed by narcissism and Machiavellianism. Openness to experience should be positively related to both general and paraphilic sexual interests, with this relationship being stronger for behaviors than fantasies. We do not expect any meaningful relationship between sexual interests and anxiety and depression scores.

#### **Developmental Correlates: Confirmatory Hypotheses**

We predict that paraphilic sexual interests will be weakly positively related to incidence of left-handedness and number of older brothers in natal males. This relationship has not been explored in natal females and thus we have no predictions.

#### **Sexual Correlates: Confirmatory Hypotheses**

We expect there to be a positive association with sociosexuality and sexual interests, with this relationship being stronger in sexual behaviors and paraphilic interests than in sexual fantasies or normophilic interests. Similarly, a more lifetime sexual partners should be related to higher sexual behavior engagement, with this being stronger for paraphilic sexual interests. Sexual compulsivity should be positively related to paraphilic interests such as voyeurism and exhibitionism and have weak or no associations with other sexual interest domains. We expect to find a positive relationship between more non-heterosexual attraction and sexual interests in general. We also hypothesize that people with greater sexual interests (defined as more arousal to fantasies + more engagement in sexual behaviors) should have more positive attitudes towards sadomasochism.

#### **Demographic Correlates: Confirmatory Hypotheses**

We predict that men will show greater sexual interest levels (both fantasies and behaviors in all dimensions) than women, except for the case of submission, in which women will indicate a greater interest than men. Years of education and ethnicity (white) should be positively related to BDSM-related sexual behaviors, but we do not expect this relationship to be found for courtship-related paraphilic interests or normophilic sexual interests. People with more non-traditional relationship structures (e.g., non-monogamy) are expected to have higher levels of general sexual interests. Given that these are largely categorical variables, gender, religion, ethnicity, sexual orientation, and relationship type will be examined via independent *t*-tests. In order to simplify interpretation of analyses, follow pre-registered hypotheses and account for sample size variance between groups, we have coded these categories as binary (e.g., heterosexual vs non-heterosexual).

### **Method**

This study received ethical approval from King's College London's Psychiatry, Nursing and Midwifery ethics subcommittee, reference number HR-17/18-5550. We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

#### **Participants and Sampling**

Participants were 4280 adults that resided in the United States (US), Canada, the United Kingdom (UK), or the Republic of Ireland. We recruited through social media, advertisement posters, and Mechanical Turk via Qualtrics survey software. There were 6025 responses, but 1745 were removed due to one or more of the following: providing an age of < 18, not fully completing either of the sexual fantasy or behavior measures, having more than 80% missing data, or responding 'not at all' (on a 1-4 scale of 'completely' to 'not at all') to either of two social desirability questions: "1) To what extent do you feel you were able to be completely open in answering this questionnaire?" and 2) "How accurately do you believe your answers to the above questions reflect your true feelings and behavior?" (Dunne et al., 2001). See Table 1 for demographic information. The median number of years spent in full time education was roughly equivalent to an undergraduate degree. Demographic correlates did not differ significantly ( $ps > .05$ ) based on site of recruitment.

#### **Table 1**

##### *Participant characteristics*

Variable	%	<i>n</i>
<b>Sex</b>		
Male	49.6	2121
Female	50.2	2149
Prefer not to say	0.2	10
<b>Gender</b>		
Man	49.0	2097
Woman	48.2	2062
Other	2.6	113
Prefer not to say	0.2	8
<b>Place of residence</b>		
United States	63.6	2722
Canada	11.8	507
United Kingdom or Ireland	24.6	1051
<b>Ethnicity</b>		
White	82.6	3537
Mixed	4.5	194
E/SE Asian	3.5	149
Hispanic/Latino	3.4	146
Black	2.8	120
S Asian	1.5	64
Native	0.5	20
Other	1.1	50
<b>Sexual Orientation</b>		
Heterosexual	64.2	2748
Bisexual	21.7	929
Gay/Lesbian	6.3	271
Other	5.4	232
Asexual	2.3	100
<b>Religious Affiliation</b>		
None	64.0	2741
Christianity	19.1	816
Catholicism	8.3	356
Judaism	1.6	70
Buddhism	1.3	56
Islam	0.7	32
Hinduism	0.4	15
Other	4.5	194
<b>Relationship Status</b>		
Committed	29.7	1271
Married	29.4	1258
Single	23.0	986
Dating	8.8	376
Non-monogamous	5.7	245
Separated/Divorced	2.5	110
Widowed	0.3	12
Other	0.5	22
<b>Criminal History</b>		
Ever been incarcerated (y)?	2.9	123
Convicted b/c violence (y)?	0.7	29
<b>Recruitment Source</b>		
Social Media	43.5	1864
Mechanical Turk	12.4	529
Posters/anonymous link	44.1	1887
	Mean	SD
Age	31.26	11.04
	Median	SD

Years of full-time education	17	3.26
Time to completion (in min)	35.83	87.55*

*Note.* \*SD value is due to participants leaving the survey page open on browsers for extended periods of time (many hours to multiple days), either during or after completion; median value is more representative of true completion time.

This study was powered to be able to psychometrically assess the Sexual Fantasies and Behaviors Inventory (SFBI; see Brown et al., 2021). Some data from this study were used in two previous publications: 1) validation of the SFBI (Brown et al., 2021) and 2) erotic target identity inversions (Brown et al., 2020a). At the time of preregistration, no analyses for this study had been performed and no correlational variables aside from anxiety, depression, sociosexuality, ASD symptoms, and Dark Triad traits were cleaned. These variables were used in sub-sample analysis in the above studies and were analyzed in the full sample as is presented here.

### Measures

Given the issues with using Cronbach's alpha ( $\alpha$ ) as a measure of internal consistency, such as its assumption that all items equally contribute to the measurement of a construct, we have chosen to report McDonald's Omega ( $\omega$ )<sup>1</sup>, which offers a more robust measure of scale reliability (Hayes & Coutts, 2020; Peters, 2018). Interpretations of  $\alpha$  and  $\omega$  are similar, with  $>.7$  indicating good internal reliability and  $>.9$  indicating excellent internal reliability. All scale scoring was done via factor score estimates unless indicated otherwise.

### Sexual Interests

This was measured via the Sexual Fantasies and Behaviors Inventory (SFBI; see Appendix A). Before the final model was selected, there was an iterative process to reduce item pool and determine factor structure. During item reduction, items related to some paraphilias (e.g., fetishism) were dropped; this was based on examining factor loadings and model fit information and was guided by theory. Thus, this scale does not individually assess all paraphilias listed in either the DSM-5 or ICD-11. This often occurs when using latent variables to reach conclusions about overarching

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<sup>1</sup> Omegas are calculated based on factor loadings on individual scale items. As factors are required to have at least 3 indicators per latent variable, the internal consistency for sub-scales shown here with only two indicators will be reported via Cronbach's  $\alpha$ .

constructs (e.g., 'sexual fantasies') and is beneficial as many individual variables (e.g., specific/narrow sexual interests) can be aggregated to represent underlying concepts.

The sexual fantasies inventory (SFI) was comprised of 28 items where participants were instructed to report their level of sexual arousal when thinking or imagining each of the items (e.g., you are receiving oral sex) using a 7-point Likert scale ranging from -3 (very repulsive) to 3 (very arousing), with 0 indicating indifference. This response scale mirrors that of the Paraphilias Scale (Seto et al., 2012). The SFI demonstrated a bifactor model with one general factor and six specific factors: 1) normophilia, 2) domination/sadism, 3) submission/masochism, 4) humiliation/degradation, 5) rough sex, and 6) fantasies of intrusion. Higher scores indicate increased sexual arousal to fantasies. The sexual behaviors inventory (SBI) was also comprised on 28 items where participants were instructed to report their frequency of engaging in specific sexual behaviors using a 6-point Likert scale (-1 = never and don't want to try, 0 = never but would like to try, 1 = once or twice ever, 2 = once a year or more on average, 3 = once a month or more on average, 4 = once a week or more on average). The SBI demonstrated a bifactor model with one general and five specific factors: 1) normophilia, 2) assuming power, 3) relinquishing power, 4) rough sex, and 5) intrusive behaviors. Higher scores indicate increased sexual behavioral engagement.

The most notable difference between the SFI and SBI models was a lack of the humiliation/degradation factor in the sexual behavior model. In the fantasy model, items such as 'you are verbally degrading and humiliating someone' and 'you have humiliating statements written on your body' combined into a single factor that represented both degrading others and being degraded by others. However, in the behavior model, these items were incorporated by relevant power exchange dimensions, with the former item becoming part of the assuming power dimension (including items about domination and sadism) and the latter becoming part of the relinquishing power dimension (including items about submission and masochism). Intrusive fantasies and behaviors here refer to the so-called 'courtship disorders', including voyeurism, exhibitionism, and frotteurism. Rough sex factors referred to interests such as biting, scratching, and hair pulling.



Bifactor Omega values were estimated via the Omega programme (Watkins, 2013);  $\omega_S$  represents values for subscales and  $\omega$  represents the general factor. For the SFI, general  $\omega = .95$ , normophilia  $\omega_S = .79$ , domination/sadism  $\omega_S = .91$ , submission/masochism  $\omega_S = .88$ , humiliation/degradation  $\omega_S = .88$ , rough sex  $\omega_S = .84$ , and fantasies of intrusion  $\omega_S = .84$ . For the SBI, general  $\omega = .95$ , normophilia  $\omega_S = .85$ , assuming power  $\omega_S = .91$ , relinquishing power  $\omega_S = .92$ , rough sex  $\omega_S = .85$ , and intrusive behaviors  $\omega_S = .78$ . Items for both the SFI and SBI were estimated as uncorrelated (orthogonal) specific factors with a higher order general factor via ESEM, a technique that combines confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) for confirmatory purposes. Factor scores were extracted from this final model.

### ***Depression and Anxiety***

Depression was measured via the Patient Health Questionnaire (PHQ-9; (Kroenke et al., 2001). Nine-items assessed how often participants had experienced depressive symptoms in the past two weeks (e.g., 'feeling hopeless') on a 4-point scale (1 = not at all, 2 = several days, 3 = more than half the days, 4 = nearly every day). Items were treated as representing a single latent factor in a CFA  $\omega = .94$ , 95% CI [.93, .94]. Anxiety was assessed via the General Anxiety Disorder measure (GAD-7; (Spitzer et al., 2006). Seven items assessed how often participants experienced anxiety symptoms (e.g., 'being unable to stop worrying about things') using the same response scale as the PHQ-9. Items were estimated as a single latent factor in CFA,  $\omega = .95$ , 95% CI [.94, .95]. Higher scores indicated increased depression and anxiety symptoms, respectively.

### ***General Psychological Wellbeing***

General psychological wellbeing was measured using the shortened Psychological Well-Being scale, an 18 item scale with 6 factors: 1) self-acceptance, 2) personal growth, 3) purpose in life, 4) environmental mastery, 5) autonomy, and 6) positive relationships with others (Ryff & Keyes, 1995). Responses were on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree). An example from the environmental mastery scale is 'in general, I feel I am in charge of the situation in which I live'. When estimated as a single latent construct via CFA, the model was unable to converge. We then estimated each factor as a single correlated latent construct. Reliability values were mixed; self-

acceptance  $\omega = .08$ , 95% CI [.01, .15], personal growth  $\omega = .76$ , 95% CI [.75, .78], purpose in life  $\omega = .58$ , 95% CI [.55, .60], environmental mastery  $\omega = .53$ , 95% CI [.50, .56], autonomy  $\omega = .67$ , 95% CI [.65, .69], and positive relationships with others  $\omega = .61$ , 95% CI [.58, .65]. Given the very low internal reliability for self-acceptance, we chose to drop this factor and it was not included when estimating factor scores for the scale. The values for overall the revised scale were  $\omega = .88$ , 95% CI [.87, .88]. Higher scores indicated increased general psychological wellbeing.

### ***Disgust Sensitivity***

A short form of the Disgust Scale-Revised (DS-R) assessed disgust sensitivity (Olatunji et al., 2007). Five items included statements about how much it would bother/upset someone to experience certain events (e.g., 'you are touching a dead body') on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) and three items assessed how disgusting someone would find certain events (e.g., seeing someone's intestines after a car accident) on a 5-point Likert scale (not at all disgusting-extremely disgusting). Items were estimated as a single latent factor via CFA,  $\omega = .86$  95% CI [.85, .87]. Higher scores indicated more disgust sensitivity.

### ***Sociosexuality***

The Revised Sociosexual Orientation Inventory assessed sociosexuality, defined as the willingness to engage in sexual activity outside of a committed relationship (Penke, 2011). The seven-item measure assesses number of sexual partners in different contexts (e.g., casual or serious relationships), fantasizing about sex with others when in a relationship, and agreement with statements about casual sex (e.g., 'sex without love is okay'). Response scales differed based on the question. Items were combined into a single latent factor via CFA,  $\omega = .84$ , 95% CI [.83, .85]. Higher scores indicated increased sociosexuality.

### ***Big-5 Personality Traits***

The Ten Item Personality Inventory assessed Big 5 personality traits: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Gosling et al., 2003). Two items represented each trait, with one being contraindicative. For example, 'anxious, easily upset' and 'calm, emotionally stable' measured neuroticism. Participants responded on a 7-point Likert scale (1

= disagree strongly, 7 = agree strongly). Given that only two-items make up each dimension, estimations of factor scores are not possible, as latent factors require at least 3 items. Instead, average scores were calculated for each trait; openness to experience  $\alpha = .42$ , conscientiousness  $\alpha = .62$ , extraversion  $\alpha = .76$ , agreeableness  $\alpha = .38$ , and neuroticism  $\alpha = .74$ . Cronbach  $\alpha$  for these subscales are often low due to items utilising positive and negative poles and having only two items per scale; this does not indicate poor construct reliability in this instance (Woods & Hampson, 2005). Higher scores indicate exhibiting more of each personality trait.

### ***Dark Triad Traits***

The Dark Triad traits are comprised of narcissism, Machiavellianism, and psychopathy. These were assessed by the 27-item (9 per trait) Short Dark Triad (Jones & Paulhus, 2014) on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). An example item for the narcissism factor is 'people see me as a natural leader'. Factor analysis suggests that these are represented as three distinct factors. Thus, the measure was estimated as three correlated factors via CFA: narcissism  $\omega = .76$ , 95% CI [.75, .77], Machiavellianism  $\omega = .82$ , 95% CI [.81, .83], and psychopathy  $\omega = .79$ , 95% CI [.78, .80]. Higher scores indicated increased Dark Triad traits.

### ***Childhood Gender Nonconformity and Gender Identity Discomfort***

Participants indicated their level of gender nonconformity in childhood (from as early as they could remember to 12 years old) on 10 items rated on a 5-point Likert scale (Zucker et al., 2006). Response items differed by question. Items were recoded so that higher scores indicated higher gender nonconformity, using sex assigned at birth to determine childhood gender roles. An example item is 'as a child, I liked to experiment with cosmetics and jewellery'. These were estimated as a single latent construct via CFA,  $\omega = .89$ , 95% CI [.89, .90]. Gender identity discomfort was measured with a single item on a 7-point Likert scale (1 = very uncomfortable, 7 = very comfortable): 'how comfortable are you currently with the gender you were assigned at birth?'

### ***Autism Spectrum Traits***

The 10-item Autism Spectrum Quotient (AQ-10) assessed the level of ASD traits, with higher scores indicating more autistic traits (Allison et al., 2012). Items assessed traits such as 'I often notice

small sounds when others do not' and 'I like to collect information about categories of things' on a 4-point Likert scale (1 = definitely agree, 4 = definitely disagree). AQ-10 items were estimated as a single latent construct via CFA,  $\omega = .73$ , 95% CI [.71, .74]. Lower scores indicated more autism traits.

### ***Dyadic Sexual Communication***

The Dyadic Sexual Communication Scale assesses perception of sexual relationship communication (Catania, 2011). Thirteen items were responded to on a 6-point Likert scale (1 = disagree strongly, 6= agree strongly), such as 'my partner and I can usually talk calmly about our sex life'. Higher scores indicated better sexual communication. Items were estimated as a single latent construct in CFA,  $\omega = .93$ , 95% CI [.93, .94].

### ***Sexual Consent***

The revised Sexual Consent Scale assesses different dimensions of sexual consent negotiations (Humphreys, 2011). In the present study, we chose to examine the 1) positive attitudes towards establishing consent and 2) perceived behavioral control subscales. Nine items for each subscale (18 total), such as 'I feel that sexual consent should always be obtained before the start of any sexual activity' were responded to on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree). Higher scores on the first subscale ( $\omega = .93$ , 95% CI [.93, .94]) indicated more positive attitudes towards establishing consent and higher scores on the second subscale ( $\omega = .93$ , 95% CI [.92, .93]) indicated an increased perception of behavioral control when asking for consent. The overall sexual consent scale also showed good internal reliability,  $\omega = .94$ , 95% CI [.94, .95]. Items were estimated as two correlated factors via CFA.

### ***Attitudes Towards Sadomasochism***

The Attitudes about Sadomasochism scale assesses stereotypes and prejudice against people engaging in consensual sadomasochism (Yost, 2010). This is a 23-item measure with four subscales and a 7-point Likert scale (1 = disagree strongly, 7 = agree strongly). Questions largely focused on social perceptions (e.g., 'sadomasochism is a perversion'), perceived violence of sadomasochism, and lack of tolerance. As we were more interested in general attitudes, we chose to calculate a total

score and thus treated the items as representing a single factor,  $\omega = .98$ , 95% CI [.98, .98]. Higher scores indicated more negative attitudes towards sadomasochism and sadomasochism practitioners.

### ***Sexual Sensation Seeking and Compulsivity***

To assess the interference of sexual behavior and the failure to control sexual impulses, we used the Sexual Sensation Seeking and Sexual Compulsivity Scales (Kalichman & Rompa, 1995). Ten items (e.g., 'my desires to have sex have disrupted my daily life') were answered on a 4-point Likert scale (1= not at all like me, 4 = Very much like me), with five items each for sensation seeking and sexual compulsivity. Higher scores indicated more dysfunction related to sexual sensation seeking ( $\omega = .88$ , 95% CI [.88, .89]) and compulsivity ( $\omega = .89$ , 95% CI [.88, .90]). Items were tested as two correlated factors via CFA.

### ***Handedness***

The Edinburgh Handedness Inventory (Caplan & Mendoza, 2011) assesses hand dominance by asking about hand use preference in ten different tasks (e.g. writing, brushing teeth). Higher scores indicate more-exclusive right handedness. As responses were treated as a binary (yes or no) for each task, scores used here are sum-scores and a reliability test was not performed.

### ***Sexual Orientation***

Sexual orientation was measured in two ways. First, participants were asked about their sexual orientation label (heterosexual, bisexual, gay/lesbian, asexual, or other). They were then asked to report sexual orientation using a 9-point Kinsey-like scale, where 0 = no sexual attraction, 1 = exclusively heterosexual attraction and 7 = exclusively homosexual attraction, and 8 = prefer not to say. In analyses regarding sexual orientation, only participants with scores 1-7 were used.

### ***Additional Developmental Variables***

A number of single-item questions assessed the following: height (in cm), weight (in kgs), number of older/younger brothers, older/younger sisters, and twin/triplets/etc. that their biological mother gave birth to, age of biological mother at birth, and age of biological father at birth.

### ***Additional Sex-related Variables***

Additional single-item questions were included to measure potential associations between sexual interests and other facets of sexuality. We asked for age of first sexual experience, number of lifetime sexual partners, whether some form of pregnancy or STI protection was used during their last sexual encounter, if they had ever been diagnosed with an STI, and frequency of attending sex-related events (e.g., swingers parties).

### **Analyses and Hypotheses**

All analyses, both exploratory and confirmatory, were pre-registered on the Open Science Framework database at <https://osf.io/vc7p4>. Pre-registration was completed after data collection but before analyses specific to this study. However, parts of this data set were analysed for two previous studies. All correlates in the present study used the full sample and scores were estimated in new models. All analyses were completed via R (packages used: 'lavaan', 'userfriendlyscience', and 'psych'), Mplus v. 7 (Muthén, 2015) and Omega (Watkins, 2013). With the exception of single-item measures, handedness, and Big 5 personality traits, all scores were calculated by weighted factor scores (the average of each raw score for each item multiplied by the item loading). All relevant measures had factor scores estimated via CFA; the SFBI was estimated via a bifactor-ESEM model (see Brown et al, 2021). Because some data indicated non-normality, robust measures of estimation were used in model fittings. For scales with more than five response categories, data was treated as continuous and maximum likelihood with robust standard errors (MLR) was used, as is recommended (Rhemtulla et al., 2012). For scales with five or less response categories, data was treated as ordinal and Weighted Least Squares Mean and Variance Adjusted (WLSMV) was used.

Given the breadth of variables explored here, both confirmatory and exploratory analyses will be analysed via bivariate correlations. We did not perform any partial correlations given the number of variables being investigated. Tests of differences in strengths between correlations were examined via Fisher's z-test. Due to sample size, we expect many correlations, even with small effects, to be significant at  $\alpha = .05$ . Thus, we will only be considering significant  $r$  values  $> |.20|$  to be meaningful. We chose to this value as being somewhere between small and medium effects, given that 1) there is little previous robust empirical evidence for many variables being investigated, 2)

psychological and developmental variables often show small effects, and 3) more recent research has indicated, that, for the social sciences,  $r = .20$  may be better interpreted as a medium effect (Funder & Ozer, 2019). Additionally, there are notable drawbacks of using ‘conventional’ cut offs, which often can lead to superficial interpretations (Funder & Ozer, 2019). Binomial variables (yes/no) will be examined via point-biserial correlations. We did not correct for multiple comparisons as 1) some corrections, such as the Bonferroni correction, have been recognized as being overly strict, 2) corrections for bivariate correlations typically correct for  $p$ -value whereas our conclusions are guided by effect size/meaningfulness, and 3) our approach is based on specific hypotheses rather than searching the data for any point of significance, which is when corrections are generally preferred (Armstrong, 2014). Any multiple regressions run will be exploratory and will be informed by results of bivariate correlations. As stated in the pre-registration, hypotheses regarding confirmatory analyses relate to categories of sexual interests more generally, not factors of the SFBI specifically. For relevant demographic categories (e.g., ethnicity), mean difference tests via  $t$ -tests will be performed.

## Results

First, we observed overall endorsement rates for specific factors of the SFBI. A person was considered to have endorsed a factor if they had responded to at least one factor item with a positive response. For fantasies, a response of  $\geq 1$  was required, which indicated ‘mild arousal’. For behaviors, they had to indicate participating in a one or more of the items at least once. This was also indicated by a score of  $\geq 1$ . See Table 2 for endorsement rates based on sex assigned at birth.

**Table 2**  
Endorsement Rates (%) of SFBI Specific Factors Based on Sex

Factor	Female ( $N = 2146$ )	Male ( $N = 2124$ )
Fantasies		
Normophilia	98.3	99.3
Rough Sex	84.7	77.3
Submission/masochism	74.7	67.4
Domination/sadism	64.2	78.4
Degradation/humiliation	43.5	49.5
Intrusion (courtship paraphilias)	60.4	73.4
Behaviors		
Normophilia	94.1	92.8
Rough Sex	83.5	75.4
Assuming Power	32.8	46.1
Relinquishing Power	67.6	45.7
Intrusion (courtship paraphilias)	22.7	35.5

Given the breadth of analyses, here we have reported those that are meaningful and directly relate to study aims. For full correlational matrices, please see supplemental file Tables 1 and 2 for psychological correlates, 4- 5 for developmental correlates, 6-7 for sexual correlates, and 8-9 for demographic correlates. Supplemental tables 10-14 show full demographic *t*-test information.

### **Psychological Correlates**

As predicted, measures of mental health (anxiety, depression, wellbeing) largely had no meaningful correlations with dimensions of sexual fantasies or behaviors. Disgust sensitivity was also not meaningfully related to any sexual fantasy or behavior dimension. Of the three Dark Triad traits, psychopathic traits had the most meaningful relationship with fantasy and behavior dimensions. Increased psychopathic traits were related to arousal to general ( $r = .24, p < .001$ ), domination/sadism ( $r = .23, p < .001$ ), degradation/humiliation ( $r = .23, p < .001$ ), and intrusion/courtship paraphilia fantasies ( $r = .24, p < .001$ ). Regarding behaviors, psychopathy was meaningfully related to increased engagement in general ( $r = .20, p < .001$ ), assuming power ( $r = .25, p < .001$ ), and intrusion/courtship paraphilia ( $r = .27, p < .001$ ) behaviors. When comparing strengths of correlations between fantasy and behavior dimensions, it was found that they did not differ between general factors ( $z = 1.58, p = .112$ ), domination/sadism and relinquishing power factors ( $z = 0.98, p = .327$ ), degradation/humiliation and relinquishing power factors ( $z = 1.11, p = .266$ ), or intrusion factors ( $z = 1.25, p = .210$ ). Machiavellianism and narcissism were not meaningfully correlated with any sexual fantasy or behavior dimensions.

Given evidence linking Dark Triad traits with paraphilic interests, especially those involving non-consent or forms of sadism, we ran multiple regressions with Dark Triad traits predicting arousal to domination/sadism ( $\beta_{Mach} = .070, \beta_{Narc} = .074, \beta_{Psych} = .160$ ), degradation/humiliation ( $\beta_{Mach} = .040, \beta_{Narc} = -.037, \beta_{Psych} = .215$ ), and courtship paraphilias ( $\beta_{Mach} = -.044, \beta_{Narc} = .123, \beta_{Psych} = .220$ ) and engagement in assuming power ( $\beta_{Mach} = .027, \beta_{Narc} = .055, \beta_{Psych} = .215$ ) and courtship paraphilia ( $\beta_{Mach} = -.058, \beta_{Narc} = .088, \beta_{Psych} = .268$ ) behaviors (see supplemental table 3). All models were significant. All Dark Triad traits were significant predictors, except for Machiavellianism



predicting engaging in assuming power behaviors, though effect sizes were small for both Machiavellianism and narcissism across models. Psychopathy remained the strongest predictor, particularly for courtship-disorder related fantasy arousal and behavioral engagement.

There were no other meaningful relationships between fantasy factors and psychological correlates, including Big 5 traits, ASD traits, and childhood gender nonconformity. For behaviors, there was a meaningful relationship between decreased ASD traits and increased normophilic engagement ( $r = .24, p < .001$ ), increased openness to experience and general behavioral engagement ( $r = .20, p < .001$ ), and increased extraversion and normophilic engagement ( $r = .22, p < .001$ ). This did not support our hypothesis that openness to experience should be meaningfully related to both general and paraphilic interests or the hypothesis that it should be more strongly related to behavioral dimensions rather than fantasy dimensions ( $z_{general} = 1.25, p = .210$ ).

### **Developmental Correlates**

There were no meaningful (and often no significant) correlations between any dimension of sexual interests and developmental correlates. Given that studies on paraphilic interests and developmental correlates have focused on males, we then investigated these correlates by sex (information available upon request). Again, there were no meaningful relationships between dimensions of sexual interests and developmental variables of any kind for males or females. This did not support our hypothesis that there would be weak but meaningful relationships between left handedness and number of older brothers for males with paraphilic sexual interests.

### **Sexual Correlates**

Non-heterosexuality (Kinsey scores) and age of first sexual experience were not meaningfully related to sexual interest dimensions. As hypothesized, sociosexuality was generally related to sexual interests. It was meaningfully related to arousal to general ( $r = .36, p < .001$ ), intrusive/courtship paraphilia ( $r = .32, p < .001$ ), and normophilic fantasies ( $r = .31, p < .001$ ) and related to engagement in all behavioral dimensions ( $r_{general} = .38, p < .001$ ;  $r_{rough\ sex} = .29, p < .001$ ;  $r_{assuming\ power} = .24, p < .001$ ;  $r_{relinquishing\ power} = .22, p < .001$ ;  $r_{intrusion} = .26, p < .001$ ;  $r_{normophilia} = .41, p < .001$ ).

There was a stronger association for normophilic behaviors compared to fantasies ( $z = 4.50, p < .001$ )

and for intrusive interest fantasies and compared to behaviors ( $z = 2.49, p = .013$ ). Associations between fantasies and number of male/female partners were mixed; results were more consistent for the relationship between partner numbers and behavioral engagement. More male partners was meaningfully related to more engagement in general ( $r = .29, p < .001$ ), rough sex ( $r = .25, p < .001$ ), relinquishing power ( $r = .25, p < .001$ ), and normophilic ( $r = .32, p < .001$ ) behaviors. More female partners were meaningfully related to general ( $r = .27, p < .001$ ), assuming power ( $r = .32, p < .001$ ), intrusion/courtship paraphilia ( $r = .28, p < .001$ ), and normophilic ( $r = .29, p < .001$ ) behaviors. This is consistent with sex differences seen in endorsement rates and mean difference testing, given that the majority of the sample is heterosexual. However, these relationships were not stronger in paraphilic interests compared to normophilic or general interests (all  $z$ 's  $> 2.0$  and  $p$ 's  $> .05$ ).

There was generally little to no meaningful relationships between indicators of sexual health or other sexual behavioral engagement (contraceptive use, STI incidence rate/testing) and arousal to fantasies. For behaviors, there was also little relationship found here, though general ( $r = -.24, p < .001$ ), rough sex ( $r = -.27, p < .001$ ), and normophilic ( $r = -.25, p < .001$ ) behaviors were related to having been tested for STIs in the past year.

Regarding attitudes towards sadomasochism, there was an overall relationship between more accepting views of sadomasochism and increased arousal to a broader range of fantasies and increased engagement in a broader range of sexual behaviors. This relationship was meaningful for all sexual fantasy factors except for the intrusion/courtship paraphilia factor ( $r_{general} = -.42, p < .001$ ;  $r_{rough\ sex} = -.39, p < .001$ ;  $r_{submission/masochism} = -.34, p < .001$ ;  $r_{domination/sadism} = -.23, p < .001$ ;  $r_{degradation/humiliation} = -.28, p < .001$ ;  $r_{normophilia} = -.22, p < .001$ ). Similarly, it was related to increased behavioral engagement for general ( $r = -.32, p < .001$ ), rough sex ( $r = -.30, p < .001$ ), relinquishing power ( $r = -.23, p < .001$ ), and normophilic factors ( $r = -.24, p < .001$ ). Better dyadic communication was meaningfully related to increased general ( $r = -.27, p < .001$ ), rough sex ( $r = -.27, p < .001$ ), and normophilic behavioral engagement ( $r = -.27, p < .001$ ). In contrast, engaging in courtship paraphilia related behaviors ( $r = -.11, p < .001$ ) and arousal to these fantasies ( $r = -.10, p < .001$ ).

.001) was related to with poorer dyadic communication. However, this did not meet our threshold for meaningfulness, so should be interpreted cautiously.

Positive attitudes towards consent was not meaningfully related to any factors. However, decreased perception of control over consent was meaningfully related to more arousal to intrusive/courtship paraphilias ( $r = -.20, p < .001$ ). It was not related to other domains. Lastly, we looked at sexual sensation seeking and sexual compulsivity. Sensation seeking was related to more arousal to general ( $r = .27, p < .001$ ), degradation/humiliation ( $r = .21, p < .001$ ), and intrusive/courtship paraphilia ( $r = .28, p < .001$ ) fantasies and more engagement in general ( $r = .23, p < .001$ ), assuming power ( $r = .25, p < .001$ ), relinquishing power ( $r = .21, p < .001$ ), and intrusive/courtship paraphilia ( $r = .32, p < .001$ ) behaviors. Thus, most relationships here were specific to paraphilias. Increased sexual compulsivity was related to arousal to general ( $r = .28, p < .001$ ) and intrusive/courtship paraphilia ( $r = .32, p < .001$ ) fantasies and more engagement in general ( $r = .22, p < .001$ ), assuming power ( $r = .21, p < .001$ ), and intrusive/courtship paraphilia ( $r = .32, p < .001$ ) behaviors. While this does not fully support the hypothesis that sexual compulsivity should be positively related to courtship disorder-related interests have weak or no associations with other sexual interest domains, further investigation found the relationship with sexual compulsivity was stronger for intrusive/courtship paraphilic behavioral engagement as compared to general ( $z = 4.32, p < .001$ ) or assuming power ( $z = 4.41, p < .001$ ) ones. Overall, more behavioral engagement and arousal to fantasies were related to higher sexual compulsivity and sensation seeking.

### **Demographic Correlates**

Younger age was meaningfully related to rough sex fantasies ( $r = -.26, p < .001$ ) and older age was meaningfully related to both intrusion/courtship paraphilia fantasies ( $r = .20, p < .001$ ) and behaviors ( $r = .24, p < .001$ ). There were no meaningful relationships with years spent in full time education, conviction of a violent crime, or history of incarceration. This failed to support our hypothesis that people who were younger and more educated would be related to more arousal to/engagement in BDSM related interests.

We then completed mean different testing based on demographic factors; more detailed information for all comparisons (including descriptives) can be seen in the supplementary material. There were significant mean differences between men and women for all sexual interest dimensions, though effect sizes varied. As predicted, women showed higher scores than men for arousal to fantasies ( $t(3817.83) = 11.60, p < .001, d = 0.37$ ) and engagement in behaviors ( $t(3445.58) = 8.90, p < .001, d = 0.30$ ) related to submission. Similarly, men scored significantly higher than women on other paraphilic dimensions, including arousal to fantasies about domination/sadism ( $t(3839.05) = 19.46, p < .001, d = 0.63$ ), humiliation ( $t(3835.89) = 9.37, p < .001, d = 0.30$ ), and intrusion/courtship paraphilias ( $t(3855.34) = 14.94, p < .001, d = 0.48$ ), and more engagement in assuming power ( $t(3529.36) = 14.79, p < .001, d = 0.45$ ) and intrusion/courtship paraphilia behaviors ( $t(3573.98) = 12.91, p < .001, d = 0.43$ ). Men also had higher arousal scores for general fantasies ( $t(3860) = 8.59, p < .001, d = 0.28$ ). Other gender differences showed very small effects ( $d < .20$ ).

The hypothesis that those who identified as non-heterosexual would have had higher scores on sexual interest dimensions was partially supported. Meaningful differences ( $d > .20$ ) included non-heterosexuals scoring higher on arousal to general ( $t(3880) = 7.66, p < .001, d = 0.26$ ), rough sex ( $t(3880) = 9.29, p < .001, d = 0.31$ ), submission/masochism ( $t(3573.2487.94) = 10.84, p < .001, d = 0.38$ ), and degradation/humiliation ( $t(2544.63) = 8.84, p < .001, d = 0.31$ ) fantasies and more engagement in general ( $t(2128.84) = 12.11, p < .001, d = 0.45$ ), rough sex ( $t(3599) = 6.52, p < .001, d = 0.23$ ), and assuming ( $t(2156.89) = 6.71, p < .001, d = 0.25$ ) and relinquishing ( $t(1936.02) = 14.44, p < .001, d = 0.56$ ) power behaviors.

In all dimensions, people who were white had higher scores than people who were non-white, though these were only significantly different in the cases of normophilic fantasies ( $t(850.72) = 2.92, p = .001, d = 0.14$ ) and behaviors ( $t(805.48) = 5.01, p < .001, d = 0.25$ ), where effect sizes were small. Thus, we did not support our hypothesis people who were white would have higher scores on factors related to BDSM. People who indicated religious affiliation generally had lower scores across factors, but few were significant and effects were small. As predicted, those who identified as being in a non-monogamous relationship also showed significantly higher scores across

all fantasy and behavior factors, except in normophilic fantasies. Across demographic characteristics, this showed the largest effects. Meaningful differences included non-monogamous individuals having more arousal to general ( $t(25671) = 10.93, p < .001, d = 0.66$ ), rough sex ( $t(270.09) = 10.42, p < .001, d = 0.55$ ), submission/masochism ( $t(3970) = 6.17, p < .001, d = 0.43$ ), domination/sadism ( $t(239.78) = 4.17, p < .001, d = 0.33$ ), and degradation/humiliation ( $t(3970) = 8.80, p < .001, d = 0.61$ ) fantasies and more engagement in general ( $t(235.79) = 16.98, p < .001, d = 1.29$ ), rough sex ( $t(274.38) = 14.37, p < .001, d = 0.74$ ), assuming power ( $t(224.28) = 9.97, p < .001, d = 1.02$ ), relinquishing power ( $t(224.742) = 10.24, p < .001, d = 0.103$ ), intrusion/courtship paraphilias ( $t(227.72) = 3.87, p < .001, d = 0.35$ ), and normophilic ( $t(318.49) = 13.61, p < .001, d = 0.55$ ) behaviors.

## Discussion

### Summary of Findings

The present study extends previous work on the behavioral and psycho-social correlates of paraphilic and normophilic fantasies and behaviors in one of the larger online studies to date, using modern statistical approaches to estimate sexual interest factors and their associations with standardized measures of latent constructs and behaviors. Hypotheses regarding psychological correlates were largely supported. There was no evidence that either sexual fantasies or behaviors were related mental health measures. Regarding personality, psychopathic traits had the strongest relationship with sexual interests, especially paraphilic interests related to domination/sadism and voyeurism, exhibitionism, and frotteurism, replicating previous research (Hébert & Weaver, 2014; Lodi-Smith et al., 2014; Wismeijer & Van Assen, 2013). There was also an association with extraversion and openness to experience and general/normophilic behaviors, but not with paraphilic dimensions. We did not find any meaningful associations with disgust sensitivity, similar to a smaller study looking at disgust sensitivity in BDSM practitioners (Boulton, 2013). There was little to no meaningful association with gender nonconformity/discomfort or ASD traits, though decreased ASD traits were related to increased normophilic interest. Additionally, we found no meaningful associations with developmental correlates. Studies finding these relationships used clinical male samples (often gay) with paraphilic disorders or a history of sexual offending (Baur et al., 2016).

As predicted, higher sociosexuality was generally related to increased arousal to a broader range of fantasies and engagement in more behaviors, with there being more meaningful correlations for behavior dimensions. However, unlike our hypotheses, we did not find evidence for behavior dimensions showing significantly stronger associations with sociosexuality, except in the case of normophilia and courtship paraphilias. As expected, there was a positive association between sexual interests and number of sexual partners, especially across behavioral dimensions, but these associations were not significantly stronger for paraphilic dimensions.

We supported the hypothesis that more liberal attitudes towards sadomasochism was generally related to increased arousal to and engagement in paraphilic and normophilic interest, though this relationship was not stronger for BDSM-related factors. Generally, engaging in sexual behaviors more frequently was associated with better dyadic communication. This association between sexual frequency and communication has been found elsewhere (Roels & Janssen, 2020). Examining links to problematic sexual behaviors, we found arousal to courtship paraphilia fantasies was related to a reduced perception of control over consent; this was not found for other dimensions. Increased arousal to and engagement in a wider range of sexual interests was related to increased sexual sensation seeking and compulsivity, mirroring links between hypersexuality and desires to engage in sex (Walton et al., 2017; Walton et al., 2016). This relationship was particularly notable for fantasy arousal to and behavioral engagement in courtship paraphilias, linking to findings that these class of paraphilias are linked to compulsive sexual behaviors, hypersexuality, and behavioral disinhibition (Clark et al., 2014; Långström & Seto, 2006; Thomas et al., 2021). Similarly, increased intrusive/courtship paraphilia interests were related to more negative attitudes towards establishing consent and a perceived lack of control over establishing consent. By definition, voyeurism, exhibitionism, and frotteurism involve acting or pretending to act as if there are non-consenting parties involved. Sexual sensation seeking and compulsivity were also related to other paraphilic dimensions in this sample, such as sadomasochism, degradation, and humiliation.

Hypotheses regarding demographic associations were mixed. There was no indication that more attraction to same-gender partners was related to increased sexual interests, though mean

difference testing did find that non-heterosexual participants generally reported more arousal to sexual fantasies and more engagement in sexual behavior than heterosexual participants.

Discrepancies between these two tests may come from measurement; correlations were assessed with Kinsey scores and grouping for mean difference testing was done by sexual orientation label.

We were also limited by our binary grouping for mean difference testing; there may be other sexual orientation differences therein (e.g., gay/lesbian vs bisexual). Women exhibited more interests in submission than men. Conversely, men generally showed more arousal to and more engagement in non-submission related paraphilic factors. Men also reported more arousal to fantasies in general.

This replicated literature regarding both paraphilic and normophilic sexual fantasies and behaviors (Bártová et al., 2020; Chandra et al., 2011; Herbenick et al., 2017; Joyal & Carpentier, 2017; Richters et al., 2014; Richters et al., 2003). We did not find support for the hypotheses that more years of education or ethnicity were associated with paraphilic interests related to BDSM.

Previous research finding these association (Connolly, 2006; Richters et al., 2014) recruited from BDSM-identified samples or BDSM events rather than from samples that had either sexual fantasies or behaviors that overlapped with BDSM more generally, as was done here. Ethnic differences in these contexts might

be due more towards biases in event attendance or participation in paraphilic interest communities rather than the experience of arousal or engaging in paraphilic interests. Having religious affiliation was generally related to decreased reporting of sexual arousal and engagement in sexual behaviors across factors, potentially due to religious values that teach more conservative attitudes about sex (Ahrold et al., 2011). However, these effect sizes were small, and differences may be due to

hesitancy in responding rather than true differences in sexual fantasy and behavior patterns. Being in any type of non-monogamous relationship indicated increased sexual interests across all dimensions except normophilic fantasies. Non-monogamy may be related to more open attitudes about sex (Sizemore & Olmstead, 2018) and more sexual partners. This is also consistent with research suggesting a high overlap between non-monogamy and paraphilic interest groups (e.g., BDSM; (Botta et al., 2019; Carlström & Andersson, 2019; Connolly, 2006).

### **Implications and Future Directions**

Inspecting endorsement rates in conjunction with inferential analyses suggests that 1) normophilic sexual interest act as a 'baseline' of sexual interests regardless of sex/gender, and 2) paraphilic interests and overall propensity to be aroused by fantasies and engage in behaviors may be influenced by other psychological and sociodemographic factors. Although we did not directly test the potential influence of these factors, the findings are consistent with previous research assessing the influence of factors such as gender and sex drive on sexual fantasy and behavior concordance (Seto et al., 2021) and breadth of sexual interests (Bouchard et al., 2017; Dawson et al., 2016). Overall, there were few meaningful correlates of the sexual interest dimensions explored. There appeared to be 'groupings' of correlates, with variables being meaningfully related either to normophilic or paraphilic dimensions, but rarely both. To further assess these relationships and their causal pathways, future studies should examine correlates while controlling for relevant factors (e.g., sex) and using prospective techniques, such as cross-lagged designs or theory-driven (or causal model driven) structural equation models. This would include an investigation of the concordance of sexual fantasies and behaviors using both subjective and objective measures (e.g., assessment of genital arousal), building on a recent study by Seto et al. (2021) to include possible moderating effects of hypersexuality, sexual compulsivity, or sexual sensation seeking. This may provide evidence for classifying and defining sexual interests more broadly, such as what is best classified as 'paraphilic', by determining shared correlates or causal factors.

The sexual interests with the strongest link to problematic sexual behavior and Dark Triad traits were consistently those related to courtship paraphilias and, to a lesser extent, sadism and domination. This may have important implications for determining subgroups, such as those that report courtship paraphilias or non-consensual sadistic arousal/behavioral engagement patterns. Originally, 'paraphilic coercive disorder' was conceptualised as being a courtship paraphilia (Freund & Blanchard, 1986); we did not test this explicitly but related fantasies/behaviors were captured by the domination/sadism and assuming power factors. Notably, these dimensions did not share correlates of courtship paraphilias, such as perceived control over consent, and had a significantly weaker



association with sexual compulsivity. In terms of classification, this may point towards a distinction between desire for coercive/sadistic fantasies and other courtship paraphilias.

Any associations with variables such as psychopathy, sexual sensation seeking/compulsivity, and perceptions of consent are likely to be non-clinical, especially as this study used a community sample. There remains a gap in our existing knowledge about how to clearly identify those with paraphilic interests who are likely to sexually offend from those who fantasize and enact paraphilic interests with consenting partners. Proposed risk factors of offending include sexual fantasy, negative emotional states, personality, and history of childhood abuse (Bartels & Gannon, 2011; Drury et al., 2017; Woodworth et al., 2013); these may also be present in non-offending, non-clinical individuals with paraphilic interests, pointing to a need to better distinguish between sub-groups and risk level. Future work could test the predictive ability of risk factors for offending or distress in a larger range of paraphilias, such as pedophilia and coercive sexual sadism. Ideally, these paraphilias should also be assessed via measurements of latent constructs rather than individual scale items. This may help identify sub-groups and quantitative differences between those who have low level paraphilic interests, paraphilias, paraphilic disorders, or high risks of offending.

Our findings may also have implications for the role of social identity in paraphilic sexual interests. For example, we did not find any BDSM-specific associations with external correlates as we predicted. This may highlight the differences between people who explicitly identify as BDSM practitioners and/or attend related events from those who have fantasies and engage in behaviors that overlap with BDSM, which is what was largely captured here. This may also partially account for our lack of positive results regarding education level, ethnicity, and age. Being white was related to increased fantasies and behaviors, these were not specific to BDSM dimensions as has been shown in literature about BDSM practitioners (Brown et al., 2017; Coppens et al., 2020; Richters et al., 2014). Findings were similar for dyadic communication; it was overall engagement in a variety of sexual behaviors that was related to better sexual communication, not engagement in BDSM specifically. Additionally, there may be differences in psycho-social factors between those who engage in BDSM (or other paraphilic interests) in community settings compared to in private.

### Strengths and Limitations

This study has one of the largest non-clinical samples of sexual interests to date and explored a large range of correlates. Our primary measure of sexual interests (SFBI) was created and validated using a sophisticated approach to classifying latent structures, unlike other studies (Bouchard et al., 2017; Dawson et al., 2016). We also compared correlates across both fantasy and behavior dimensions. Additionally, we investigated the psychometric properties of all relevant scales by utilising CFAs to extract factor scores. This is a more accurate way of measuring latent constructs. We used  $\omega$  values to assess reliability, a more robust measurement than Cronbach's  $\alpha$ .

A notable limitation of the response scale of the SFBI is that it assumed that arousal and repulsion to fantasies are on a single polar scale, though for some people they may exist in tandem. Models of sexual motivation, such as the information processing model (Janssen et al., 2000) and the incentive motivation model (Toates, 2009), suggest that there is parallel processing of conscious and unconscious processing of sexual stimuli, whereby there may be an unconscious process that triggers genital arousal that can be dampened or heightened by a negative or positive appraisal of the stimuli. In this way, it would be possible to have a genital/physiological arousal response while being subjectively repulsed by the sexual stimuli (a thought or fantasy). However, the SFBI response scale focuses on subjective appraisal of the fantasy, where it might be less possible to have simultaneous positive and negative *subjective* appraisal of a stimulus. Currently, there is a lack of literature on how common this might be and how it may affect scale responses and should be considered in future scale development. Additionally, this scale captured arousal to fantasies and frequency of engagement in behaviors and thus we could not observe other important factors like frequency of having fantasies or arousal/satisfaction when engaging in behaviors.

These data were cross sectional, and no causal conclusions can be drawn. Additionally, data collection was via self-report measures about a sensitive topic online. However, research (Hamilton & Morris, 2010) has suggested that data about sexual behavior collected from different sources, including self-report, shows relative consistency. Using an online platform allowed us to access participants whos' sexual desires are hidden or stigmatized and may have increased their

representation. Anonymous responses also reduced potential feelings of embarrassment or discomfort. When examining the psychometric properties of scale fit for correlates, model fit was mixed. This is likely due to scales (e.g., the psychological wellbeing scale) often not undergoing rigorous psychometric testing before publication and use. Lastly, given the breadth of correlates examined here, we were limited to bivariate correlations, mean difference testing, and multiple regression. We did not control for variables such as sex drive or gender when examining these relationships, though some correlates (e.g., developmental variables) were broken down by sex. When looking at mean differences, we chose to split relevant variables (e.g., ethnicity) into two groups, which reduces specificity and the ability to identify true differences between groups.

### **Conclusions**

Our study contributed to the literature in three ways. First, it employed robust techniques to assess sexual fantasies and behaviors and external correlates in a large non-clinical sample. Second, it identified that there was little relationship between normophilic or paraphilic interests and psychopathology or developmental variables but found that sociosexuality was largely related to both sexual fantasy and behavior dimensions. There were notable associations between courtship paraphilias and interests related to domination/sadism and psychopathic traits, sexual compulsivity, and sexual sensation seeking. Courtship paraphilic arousal and engagement was also related to negative beliefs about consent, providing evidence for their association with hypersexuality and problematic sexual behaviors. Third, it identified a number of important group differences, such as women consistently showing more interest in submission/masochism and men showing more interest in all other paraphilic fantasies/behaviors, and non-heterosexual and non-monogamous participants generally showing higher fantasy arousal and behaviors scores.

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