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A Systematic Scoping Review of the Prevalence, Etiological, Psychological, and Interpersonal Factors Associated with BDSM

Ashley Brown , Edward D. Barker, and Qazi Rahman

Psychology Department, Institute of Psychiatry, Psychology, and Neuroscience, King's College London

ABSTRACT

BDSM (bondage, discipline, dominance, submission, and sadomasochism) encompasses a diverse set of sexual interests. Research interests in BDSM have been historically underpinned by examining potential mental health issues, unhealthy fixations on specific sexual behaviors, and/or the presence of childhood trauma, as is predicted by psychopathological and psychoanalytic models. The objective of this scoping review was to provide an overview of the current landscape of BDSM research, including incidence rates, evidence for psychopathological, psychoanalytical, biological, and social etiological factors, demographics of BDSM practitioners, and the psychological correlates of those with BDSM interests. After the literature search and screening process, 60 articles were included. BDSM related fantasies were found to be common (40-70%) in both males and females, while about 20% reported engaging in BDSM. Results show little support for psychopathologic or psychoanalytic models. In the selected samples studied, BDSM practitioners appear to be white, well educated, young, and do not show higher rates of mental health or relationship problems. Research supports BDSM being used as a broadening of sexual interests and behaviors instead of a fixation on a specific interest. Future empirical research should focus on non-pathological models of BDSM, discrimination of BDSM practitioners, interpersonal relationships, and biological factors.

Although people may use BDSM and sadomasochism interchangeably, BDSM is broader in scope, and represents three overlapping acronyms: bondage and discipline (BD), domination and submission (DS), and sadomasochism (SM). A precise definition of BDSM is difficult to generate, but it generally includes sexual behaviors that involve some sort of power exchange between two or more partners and/or the use of pain to elicit sexual pleasure, though sensations other than pain (e.g., pleasure) are also frequently used in play (Williams, 2006; see Weinberg, Williams, & Moser, 1984 for a similar definition based on qualitative data). This power exchange is rooted in affirmative consent; all parties involved consent to the behaviors taking place and can withdraw consent at any time (e.g., through the use of a safeword). It is useful to note that the experience and purpose of pain in a BDSM context differs between individuals. A behavior may be considered painful by some, but not by others. In contemporary settings, BDSM has grown into a subculture complete with events, social networks, and differing social identities (Williams, 2006), though due to it being historically pathologized, people interested in BDSM may hide their sexual proclivities from others (Freud, 1906/1953; Krafft-Ebing, 1886). Because of its basis in an exchange of power, BDSM oriented individuals choose identities within that power difference. Submissives, bottoms, and masochists are the most common identities on the side of relinquishing power, with dominants, tops, and sadists assuming power. Dominants and submissives do not necessarily enjoy giving or receiving pain, while sadists and masochists do not necessarily want to serve or be served by

their partners. Switches are those that assume roles on either side, usually dependent on context and partner.

Because BDSM was historically thought of as being caused by mental illness, pathology, or complications occurring in childhood, it has been associated with paraphilic disorders. This view still partially exists, with sexual sadism, sexual masochism, and fetishistic disorder being listed in both the DSM-5 and ICD-10 (but the ICD -11 has since removed sexual masochism). Many sex researchers contest the inclusion of some of these in diagnostic manuals because they stigmatize BDSM practitioners as well as medicalize what may be relatively benign and even common sexual interests (Moser, 2018, 2016; Seto, Kingston, & Bourget, 2014; Shindel & Moser, 2011; Wright, 2006). Having BDSM sexual interests alone no longer meet the criteria of a paraphilic disorder. In order to meet the diagnostic criteria for sexual masochism or sexual sadism disorder, an individual must have experienced clinically significant distress or impairment due to their sexual desires or must have acted on these sexual urges with a nonconsenting person (American Psychiatric Association [APA], 2013). However, these criteria are vague, and the level or cause of distress has received little clarification.

Despite the attention being paid to aspects of BDSM in individual disciplines (e.g., psychiatry, psychology), there have been no substantial reviews of the existing literature and thus there is little understanding of the current landscape of the BDSM research evidence base. The purpose of this scoping review is to help fill

Table 1. Database search terms

Database	Date Searched	Search Terms
Embase; MEDLINE; PsycARTICLES; PsycINFO (on Ovid)	February 26 th , 2019 Updated search on June 27 th , 2019	1. ((personality or mental health or anxiety or depression or individual differences or biological or neurodevelopment or genetic or hormones or neural or learning or modeling or conditioning or relationships or interpersonal or marriage or polyamor* or communication or sexual health or sexual risk or consent or sexual knowledge or sex education) not (offend* or forensic or criminal or medic*)).ab,ti. 2. ((bdsM or sadism or masochism or sadomasochism or kink* or bondage or leather or fetish* or domination or submission) not (offend* or forensic or criminal or medic*)).ab,ti. 3. limit 2 to english language 4. limit 3 to human 5. limit 4 to yr = "2000 -Current" 6. 1 and 6

this gap. The review includes literature on theories of the development of BDSM, prevalence rates, BDSM specific roles and behaviors within the BDSM community, and relationship factors that affect BDSM practitioners.

Method

Objective

We conducted a scoping review using the following research question: "What is the prevalence, etiological factors, psychological and interpersonal correlates associated with BDSM?" Scoping reviews in the behavioral and social sciences (including sex research) are well-suited for broad topic areas that contain primarily emerging literature or are in under-studied areas, behaviors or psychological traits. Such reviews differ from systematic reviews in that they aim to 1) broadly map and identify gaps in a particular field of study, 2) address broader, exploratory research questions, and 3) narratively describe the quantity and quality of research without using formal quality assessment or meta-analytic techniques (see Grant & Booth, 2009 for more information about how review styles differ). The methods for this scoping review were in accordance with the 2015 Joanna Briggs Institute methodology (Peters, Godfrey, McInerney, Parker, & Baldini Soares, 2015).

The uniqueness of scoping reviews is that they provide a methodology that allows a narrative assessment of emerging evidence (e.g., in new or rare fields) and thus offer a first step in research development. In new, under-studied, or minority fields of study (typical in sex research), a scoping review also provides more flexibility than traditional systematic reviews. It allows researchers to describe more clearly the diversity of the literature and studies using a range of methodologies that are often omitted due to the strict protocols of systematic reviews. The general scoping procedure includes identifying a specific area of emerging research, identifying the important sub-areas (or generating a series of broad research questions), identifying the relevant studies and generating appropriate inclusion and exclusion criteria, study search and extraction, charting the relevant study data (e.g., in tabular form), and summarizing and reporting the studies (Arksey & O'Malley, 2005). More specifically, scoping reviews differ from narrative reviews in that they 1) take a systematic (and comprehensive) approach to data search and extraction, 2) aim to investigate

areas of research that are more focused than those found in narrative reviews (which are very open-ended and unfocused), and 3) include analysis and critique of study design and overall quality.

Inclusion and exclusion criteria

Inclusion required 1) full text papers (i.e., not a conference abstract); 2) papers published in English; 3) the paper was in a peer reviewed journal; 4) empirical studies of BDSM, sado-masochism, or fetishism in relation to the variables being investigated, as stated in the objective. Exclusion criteria were 1) exclusively qualitative studies (quantitative sections of mixed methods studies were included); 2) the article did not contain original research; 3) publication before 2000¹; 4) a sample size less than 12; and 5) a sample comprised exclusively of clinical or incarcerated populations.

Search strategy

The following databases were searched on February 26th, 2019: Embase; MEDLINE; PsycARTICLES; PsycINFO. The search was updated on June 27th, 2019. Search terms were selected based on their relevance to BDSM and the areas of interest and agreed upon by AB and QR. See Table 1 for full search methodology and terms.

Results

Study characteristics

Before exclusion criteria were applied, 3,915 articles were identified with the search terms. Of the 3,100 that remained after deduplication, title and abstract screening eliminated 2,957. After full text scans of the remaining 76 articles and 57 articles identified through other sources, 59 articles were eligible for inclusion (see Figure 1 for full search results). All 133 articles included in the full text scan had references checked to ensure saturation of the relevant material. One additional article met inclusion criteria after the updated search, bringing the total number of articles included in this review to 60. Table 2 gives information on the samples, methods, and effect sizes of each study.

¹One study published in 1999 was not excluded, as the data from this study was highly relevant and was used in four other studies that were published in 2000, 2006, 2001, and two published in 2002.

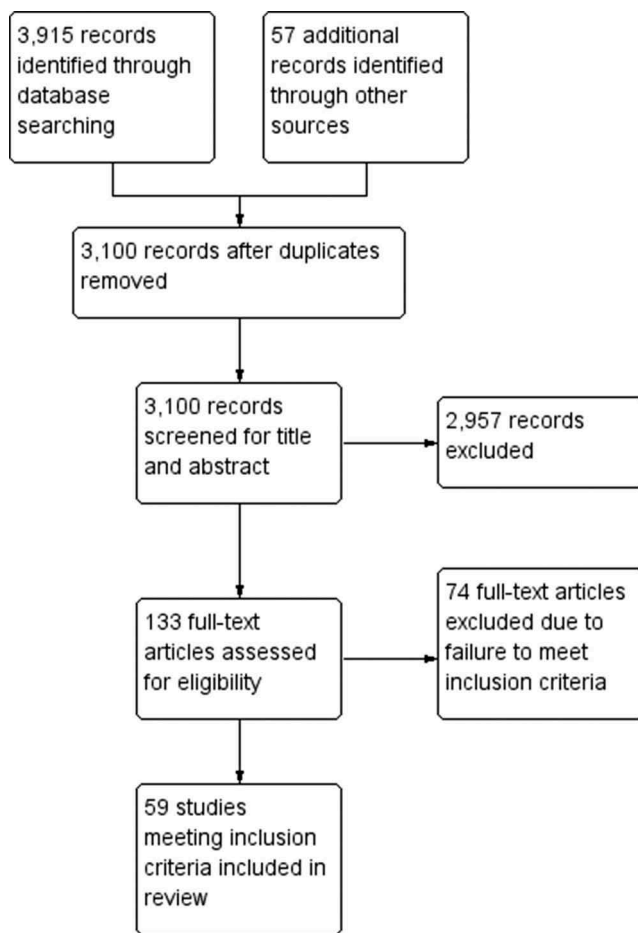


Figure 1. PRISMA flow diagram for search. Please note that the search was updated on June 27th, 2019 and includes one additional article.

Prevalence rates of BDSM related fantasies and behaviors

One nationally representative study found 68.8% of participants reported at least one BDSM fantasy or practice (Holvoet et al., 2017). Twenty-two percent of participants reported fantasies without acting on them; the remainder indicated engagement in at least one BDSM behavior. Submissive (9.5%) and masochistic acts (15.3% reported being hit by a partner) were more common than dominant (8%) and sadistic (11% doing the hitting) acts (cf. Joyal & Carpentier, 2017). While many reported BDSM fantasies, only 7.6% identified as BDSM practitioners. Another study found similar rates of BDSM related fantasies, with over half of all participants reporting at least one BDSM-related fantasy (Joyal, Cossette, & Lapierre, 2015).

Conversely, a nationally representative study from Australia in 2003 found that approximately 2% had participated in BDSM (Richters, Grulich, de Visser, Smith, & Rissel, 2003), and this only increased marginally (but non-significantly) in a follow up study 10 years later (Richters et al., 2014). However, researchers did not offer any examples or definitions of BDSM outside the meaning of the acronym, and thus, these rates may be underestimates.

Returning to the DSM-5's (APA, 2013) paraphilic classifications (many of which relate to BDSM), Joyal and Carpentier (2017) asked participants about their interest in the eight

paraphilias: sadism, masochism, voyeurism, exhibitionism, fetishism, pedophilia, frotteurism, and transvestism. Just over 45% acknowledged a desire for at least one paraphilic behavior, and 33.8% had engaged in a paraphilic behavior at least once in their life. Neither sadism, masochism, nor fetishism (fantasy or behavior) were statistically rare (less than a 2.3% incidence rate), and only sadism could be considered unusual (less than 15.9% incidence). Rates were even lower for engaging in behaviors consistently (>10 times over the lifetime): 3.5% for fetishism, 1.4% for masochism, and 0.3% for sadism. This highlights the importance of distinguishing between sub-groups who report different levels of desire and engagement in BDSM.

Joyal (2015) studied broader atypical sexual interests and reported that of 45 fantasies (as described by the Wilson Sex Fantasy Questionnaire [WSFQ]), the most intense fantasy was normophilic (or non-paraphilic): receiving oral sex (for both sexes). The mean intensity of the most intense normophilic fantasy did not differ significantly from the most intense paraphilic fantasy. Four of seven clusters (57%) of the entire sample reported a most intense paraphilic fantasy that was statistically as intense or more intense than their most intense normophilic fantasy. As the DSM-5 (APA, 2013, p. 685) defines a paraphilia as "any sexual interests greater than or equal to normophilic [i.e., genital stimulation] sexual interests", these results from Joyal (2015) were taken to suggest that 57% of this sample met the criteria for having a paraphilia. Similarly, Ahlers et al. (2011) indicated that 62.4% of men reported some degree of arousal to at least one paraphilia fantasy (and 44.4% paraphilic behaviors related to at least one of these) but only 1.7% experienced distress because of it, indicating that paraphilic interests are sub-clinical for most people. These studies highlight that many non-normophilic interests (including those related to BDSM) are not statistically atypical.

Several studies indicate that BDSM interests may represent a broadening of individuals' sexual repertoire rather than being truly "paraphilic" (e.g., Cross & Matheson, 2006; Hougbedji & Guillem, 2016; Oliveira Júnior & Abdo, 2010; Williams, Cooper, Howell, Yuille, & Paulhus, 2009). For example, Oliveira Júnior and Abdo (2010) studied 10 unusual sexual behaviors: fetish, voyeurism, incest, threesomes, exhibitionism, sadomasochism, group sex, money in exchange for sex, sexual practice with animals, and swinging. Twenty per cent of the sample reported practicing only one behavior, while 18% reported practicing two or more. Nine percent reported practicing sadomasochism and 13.4% reported fetishism. Overall, findings suggest that BDSM related fantasies and behaviors are relatively common, though behavior prevalence rates are typically lower than fantasies.

Sex differences

Although BDSM fantasies and behaviors are prevalent in both men and women, there appear to be sex differences herein (Joyal et al., 2015). For example, Zurbriggen and Yost (2004) found that men's fantasies were more likely to include portrayals of themselves as dominant, and women were more likely to fantasize about submission. However, regardless of sex, arousal to masochism and sadism were strongly related.

Table 2. Methodology and outcome information for articles included in review

Author(s)	Pub. Year	Appears in Review		Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
		Section	n				
Ahlers et al.	2011	Demographics; Incidence Rates*	367 men	Opportunistic sub-sample of a representative sample of Berlin men. This was a nested sample from a larger study.	Quantitative survey, in-person	Nested study in a larger survey ($n = 6,000$) that used multiple pre-existing measures of health and sexual functioning/interests	OR (95% CI), Those with at least one paraphilic associated arousal pattern compared to those with none were more likely to: Be single: 2.64 (1.05, 6.64), $p = .040$ Masturbate at least once per week: 4.40 (1.78–10.91), $p = .001$ Use pornography: 2.65 (1.54, 4.59), $p < .001$ Ever have an STD: 2.60 (2.24, 3.03), $p < .001$ Have HIV: 2.89 (1.49, 5.60) $p = .001$ Females engaged in more humiliation behaviors than males: $d = 0.37$, $p < .05$ Males engaged in more hypermasculine behaviors than females: $d = 0.62$, $p < .01$ Gay males preferred hypermasculine behaviors more than heterosexual males: $d = 0.42$, $p < .01$ Heterosexual males preferred humiliation behaviors more than gay males: $d = 0.43$, $p < .01$ OR (95% CI), Women who had sex with both men and women (in the past 10 years) were more likely than women who only had sex with women to engage in sadomasochism: 3.66 (2.40, 5.58), $p < .001$ Psychopathy was positively related to intimate ($r^2 = .040$, $p < .05$), exploratory ($r^2 = .068$, $p < .05$), impersonal ($r^2 = .168$, $p < .01$), and sadomasochistic ($r^2 = .109$, $p < .01$) sexual fantasies. Sadomasochistic fantasies were positively related to narcissism ($r^2 = .010$, $p < .05$), but not Machiavellianism ($r^2 = .004$, $p > .05$) Women were more likely than men to list physical pain as a favorite BDSM activity: $\phi = .241$, $p < .001$ OR (95% CI): Men more likely than women to identify as dominant: 2.15 (1.28, 3.63), $p = .006$ Women more likely than men to identify as a submissive: 2.47 (1.50, 4.09), $p < .001$ Women not more likely than men to identify as a switch: 0.79 (0.45, 1.38), $p = .488$
Alison et al.	2001	Etiology; BDSM ID, Engagement, and Behaviors	184 (22 women, 162 men)	Opportunistic sampling from 2 BDSM clubs in Finland, via mail	Quantitative survey, via mail	Questionnaires from Nordling et al. (2000/2006), Sandhabba et al. (1999/2002), & Santilla et al. (2001/2002) about BDSM and sexual experience, childhood background, and mental/physical health	
Bailey et al.	2003	Incidence Rates	1,218 women	Purposive and snowball sampling of gay and bisexual women in England and Scotland	Quantitative survey, in-person	Questionnaire created for use in sexual health clinics	
Baughman et al.	2014	Psychological Correlates	643 (190 men, 435 women)	Convenience sampling of undergraduate students in Canada	Quantitative survey, online during a proctored testing session	Pre-existing measures of the Dark Triad and sexual fantasies	
Botta et al.	2019	Demographics*; BDSM ID, Engagement, and Behaviors	266 (141 men, 125 women)	Snowball sampling online of Italian BDSM identified individuals	Quantitative survey, online	In addition to pre-existing measures of sexual complaints and sexual satisfaction, questions about demographics, BDSM role, and sexual behaviors were created for this study	

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Brown et al.	2017	Demographics; Psychological Correlates	576 (384 males, 173 females, 19 other)	Convenience sampling of BDSM identified individuals across online platforms	Quantitative survey, online	Demographic questionnaire about BDSM ID/involvement and pre-existing measures of suicide and pain tolerance	The total indirect effect of fearlessness about death and perceived pain tolerance as mediators for the relationship between BDSM engagement and suicide attempts was significant for men (95% CI [.046, .371], $p < .05$) but not for women (95% CI [-.007, .355], $p > .05$).
Chivers et al.	2014	BDSM ID, Engagement, and Behaviors*; Demographics	Study 1: 54 men Study 2: 46 women	Study 1: Community convenience sample of men in Canada Study 2: Community convenience sample of women in Canada	Study 1 & 2: Quantitative quasi-experimental and survey design, in-person	Study 1: measured both genital and sexual arousal to audio narratives, paraphilias scale Study 2: same as study 1, but with the addition of measures of sexual orientation and identity	Men with masochistic sexual interest (MMI) had greater subjective arousal to masochistic sex than neutral stimuli: $r_p^2 = .843$, $p < .001$ MMI did not differ in subjective arousal to conventional and masochistic sex narratives: $\eta_p^2 = .211$, $p = .060$ MMI had sig. greater subjective response to masochistic sex stories than men with conventional sexual interest (MCI): $d = 0.90$, $p = .015$ MMI had sig. greater genital arousal to masochistic sex than neutral stimuli: $r_p^2 = .739$, $p < .001$ MMI did not differ in genital arousal to conventional and masochistic sex narratives: $\eta_p^2 = .002$, $p = .865$ MMI had sig. greater genital arousal to masochistic sex than MCI: $d = 1.06$, $p < .001$ Study 2: Women with masochistic interests (WMI) reported greater same-sex attraction than women without these interests: $\eta_p^2 = .336$, $p < .001$ WMI had sig greater subjective masochism index than women with conventional sexual interests (WCI): $d = 1.83$, $p < .001$ WMI had greater genital masochism index than WCI: $d = 0.91$, $p = .014$

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Connolly	2006	Etiology; BDSM ID, Engagement, and Behaviors*; Demographics*; Interpersonal Factors; Psychological Correlates*	132 (73 males, 56 females, 3 transgender individuals)	Convenience sample of BDSM club/organization participants in California	Quantitative survey, in-person proctored testing sessions	Detailed demographic questionnaire and 7 pre-existing measures of psychopathology	BDSM participants had lower depression ($\eta_p^2 = .440, p < .001$), anxiety ($\eta_p^2 = .847, p < .001$), PTSD/trauma ($\eta_p^2 = .494, p < .001$), and BPD ($d = -1.24, p < .001$) scores than population norms BDSM participants had higher dissociation scores than population norms: $\eta_p^2 = .127, p < .001$ Higher submission scores were related to higher PTSD scores when compared to domination scores: $\beta = -.22, p < .05$ BDSM participants had slightly lower psychological sadism ($\eta_p^2 = .147, p < .001$) and masochism ($\eta_p^2 = .207, p < .001$) scores than population norms. More submissiveness predicted more paranoia symptoms ($\beta = -.24, p < .05$) and dependence ($\beta = -.22, p < .05$). More dominance predicted histrionic ($\beta = .36, p < .01$) and narcissistic personality disorder symptoms ($\beta = .31, p < .01$). Study 1: Authoritarianism was significantly higher in control group compared to the BDSM group: $\eta_p^2 = .039, p = .034$. No significant differences in feminist beliefs between switches ($d = 0.36, p = .115$), masochists ($d = 0.31, p = .086$), or sadists ($d = 0.13, p = .559$) and controls. No significant differences between switches ($d = 0.04, p = .861$) or sadists ($d = 0.17, p = .501$) and masochists or switches and sadists ($d = 0.14, p = .589$). Males had significantly higher traditional gender role beliefs than females: $\eta_p^2 = .080, p < .001$. OR (95% CI). Sadists were not less likely to be employed than controls: 0.96 (0.38, 2.42), $p = .862$
Cross & Matheson	2006	Etiology*; Psychological Correlates	Study 1: 154 (93 BDSM ID [24 females, 69 males], 61 control/non-BDSM ID [15 females, 46 males])	Study 1: Online convenience sample of both BDSM and non-BDSM identified participants	Study 1: Quantitative survey via email or mail	Study 1: Multiple pre-existing measures of mental health, sexual behaviors, and gender bias *Study 2 & 3: These studies were not included due to exclusion criteria	

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Damon	2003	Etiology; Demographics	342 males	Online and in-person convenience sample of sadomasochistically identified males	Mixed methods survey via email or mail	Measures of SM experience created for the study, plus pre-existing measures of self-esteem and sexism	Submissives had lower self-esteem than dominants: $\eta_p^2 = .046, p < .001$ Submissives had higher benevolent ($\eta_p^2 = .115, p < .001$) and hostile ($\eta_p^2 = .033, p = .004$) sexism than dominants Not applicable/calculable for results presented in review
Dancer et al.	2006	Interpersonal Factors	146 (66 males; 80 females)	Online convenience sample of self-identified 24/7 slaves	Quantitative survey, online	A measure created about the '24/7 slave' experience	Average level of arousal to fantasies for men compared to women: Fetishism: $d = 0.48, p < .001$ (more arousal for men) Sadism: $d = 0.26, p < .001$ (more arousal for men) Masochism: $d = -0.01, p = .901$ More arousal to masochism was related to more arousal from sadism: $r^2 = .43, p < .001$ OR (95% CI), Men report arousal to sadistic sexual interest more often than women: 2.11 (1.48, 3.00), $p < .001$ Men have a higher incidence rate of atypical sexual interests than women: $d = 0.04, p < .001$ No association between non-right handedness and paraphilic interest in men: $r^2 = .006, p = .217$ Non-right handedness weakly associated with paraphilic interest in women: $r^2 = .007, p = .031$ Total indirect effect of natal sex on paraphilic interests mediated by sex drive: $\beta = -24.95\%$ CI [-31, -18] There were significant positive relationships between hypersexuality (men: $r^2 = .063, p < .001$, women: $r^2 = .091, p < .001$), sexual compulsivity (men: $r^2 = .067, p < .001$, women: $r^2 = .057, p < .001$), impulsivity (men: $r^2 = .016, p < .05$, women: $r^2 = .009, p < .05$), sensation seeking (men: $r^2 = .009, p < .05$, women: $r^2 = .017, p < .001$), and total paraphilia scores
Dawson et al.	2016	Etiology; Incidence Rates; Psychological Correlates	1,226 (351 men, 785 women, 90 unidentified)	Opportunity sample of Canadian undergraduate students	Quantitative survey, online	A measure of paraphilic interest, plus pre-existing measures of sex drive, gender beliefs, personality, and neuro-developmental factors	

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Fuss et al.	2018	Interpersonal Factors	546 (347 women, 189 men, 10 unidentified)	Convenience and snowball sample of mental health professionals (via email) from Germany, Austria, or Switzerland	Randomized controlled trial, quantitative survey, online	Case vignettes created for the study, pre-existing measures of stigma and a measure of estimated psychopathology	Mental health practitioners (MHP) gave lower pathology scores to female subjects than male subjects in sexual sadism vignettes ($\eta_p^2 = .033$, $p < .001$), but not in sexual masochism vignettes ($\eta_p^2 = .000$, $p = .964$). MHP trained in psychoanalysis pathologized sexually sadistic behaviors more than people trained in CBT: $\eta_p^2 = .013$, $p = .005$. Males with sexual sadism were perceived as being more dangerous ($\eta_p^2 = .042$, $p < .001$) and MHP indicated they wanted more social distance from males ($\eta_p^2 = .041$, $p < .001$) than females. In the sexual sadism vignettes, female subjects were less likely to be diagnosed as mentally disordered than men: $\phi = .162$, $p < .001$. Women preferred the male domination scenario more than men preferred the male domination scenario: $\eta_p^2 = .368$, $p < .001$
Hawley & Hensley	2009	Etiology*	470 (231 women, 239 men)	Opportunity sample of college students at a university in Kansas	Quantitative survey, online	Sexual fantasy vignettes created for use in this study, measures of social dominance/resource control, and short measure of neuroticism adapted from a pre-existing Big 5	Submissives scored higher than dominants on emotionality: $\eta_p^2 = .020$, $p = .020$ Dominants scored higher than submissives on desire for control ($\eta_p^2 = .029$, $p = .006$) and extraversion ($\eta_p^2 = .030$, $p = .005$)
Hébert & Weaver	2014	Demographics*; Psychological Correlates*	270 (93 males, 168 females, 7 transgender/transsexual, 2 intersex individuals, 2 unidentified)	Convenience sample from BDSM related subreddits	Quantitative survey, online	BDSM related demographic questions and pre-existing measures of desire for control, personality, self-esteem, life satisfaction, and interpersonal reactivity	Submissives scored higher than dominants on emotionality: $\eta_p^2 = .020$, $p = .020$ Dominants scored higher than submissives on desire for control ($\eta_p^2 = .029$, $p = .006$) and extraversion ($\eta_p^2 = .030$, $p = .005$)
Hillier	2019	Etiology; Psychological Correlates	68 (39 female, 23 male, 6 other)	Convenience sample from online kink identified individuals	Quantitative survey, online	Socio-demographic data, kink role identification and behaviors, preestablished measures of childhood trauma and the Big 5	Trauma scores did not significantly predict dominance ($p = .064$, R^2 not given) or submission ($p = .935$, $R^2 = .00$) scores Neither neuroticism or extraversion predicted dominance ($p = .382$, $R^2_{adj} = .001$) or submission ($p = .470$, $R^2_{adj} = .007$)
Holvoet et al.	2017	BDSM ID, Engagement, and Behaviors*; Incidence Rates; Interpersonal Factors	1,027 (459 men, 565 women, 3 other)	Representative sample of Belgian citizens	Quantitative survey, online	Measure created for the study of various BDSM interests and questions about BDSM involvement/identification	Positive relationship between dominance and submission sum scores: $r^2 = .702$, $p < .001$ Women had significantly higher submission sum scores than men: $\eta_p^2 = .010$, $p < .001$ Men had significantly higher domination sum scores than women: $\eta_p^2 = .041$, $p < .001$

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Houngbedji & Gulleem	2016	Incidence Rates	95 (62 men, 33 women)	Online convenience sample of French swingers	Quantitative survey, online	Socio-demographic data, questions about swinging and other sexual practices, self-report use of drugs, and a pre-existing measure of sensation seeking	Not applicable to/calculate for results presented in review
Joyal	2015	Demographics*; Incidence Rates*	1,516 (799 women, 717 men)	Online convenience community sample of US adults	Quantitative survey, online	A revised version of the Wilson Sex Fantasy Questionnaire	Not applicable to/calculate for results presented in review
Joyal & Carpentier	2017	Etiology; Demographics; Incidence Rates	1,040 (475 men, 565 women)	Semi-representative sample of adults in Quebec, via telephone and online	Quantitative, survey administered via telephone or online	Questionnaire created for this study that included demographic information, sexual behavior/experience, pornography consumption, paraphilic sexual arousal, and sexual satisfaction	OR (95% CI): Women had a higher desire to engage in masochism (1.7 [1.3–2.0], $p = .001$) and fetishism (1.4 [1.1–1.7], $p = .015$) than men, and men had a higher desire to engage in sadism (1.9 [1.2–3.1], $p = .007$) Women had higher lifetime engagement rates of masochism (2.0 [1.4, 2.5], $p < .001$) than men, and men had higher lifetime engagement rates of sadism (2.0 [1.1, 3.4], $p = .014$) and fetishism (1.4 [1.1, 1.9], $p = .012$) OR (95% CI) for presence of fantasies for women compared to men: Women had a higher prevalence rate for the fantasy of being dominated (1.60, [1.30–1.97], $p < .001$) and being spanked or whipped (1.43 [1.15, 1.78], $p = .001$) than men Men had a higher prevalence rate of the fantasies of dominating others (0.60, [0.49, 0.73], $p < .001$) spanking or whipping others (0.41, [.33, .51], $p < .001$), and forcing someone to have sex (0.43, [0.32, 0.57], $p < .001$) Women reported more intense fantasies about being dominated ($d = 0.29$, $p < .001$) and being whipped or spanked ($d = 0.19$, $p < .001$) than men Men reported more intense fantasies about dominating someone else than women: $d = 0.26$, $p < .001$ More domination fantasies were linked to more submission fantasies: $r^2 = .250$, $p < .001$ Men's overall ratings of sexual arousal to sexual fantasies were higher than women's: $\eta_p^2 = .106$, $p < .001$
Joyal et al.	2015	Etiology; Incidence Rates	1,516 (799 women, 717 men)	Community convenience/snowball sample of adults in Quebec advertised both online and in other media	Mixed methods survey, online or via telephone	A revised version of the Wilson Sex Fantasy Questionnaire, plus a qualitative section (not included in review) where participants described their sexual fantasies	

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Jozifkova et al.	2012	Etiology	340 (157 men, 183 women)	Opportunity sample of last-year high school students from 15 high schools in Prague. This was a nested study.	Quantitative survey, in-person	A questionnaire designed for this and a larger study, focused on relationship partner preference and bondage/dominance/submission	For males, dominance scores significantly correlated with 7/8 items about desiring hierarchical disparity between partners ($r^2 = .027-.098$, $p < .001 - < .05$); for females only 2 items correlated with dominance scores ($r^2 = .028-.102$, $p < .001 - < .05$) Opportunism scores ns. with 8 items for males ($r^2 = .002-.015$, $p > .05$) or females ($r^2 = .000-.016$, $p > .05$). Therapists with experience treating BDSM identified patients reported more positive attitudes toward BDSM: $r^2 = .023$, $p < .001$ Therapists who felt competent to treat BDSM clients had significantly more positive attitudes than those who did not consider themselves to be competent: $d = 0.82$, $p < .001$ Therapists with no graduate training on BDSM had less accepting attitudes than those with some training: $d = 0.29$, $p < .001$ Engaging in BDSM related to an increase in comfort discussing sexual topics, controlling for relationship status: $\beta = .25$, $p < .001$. Engaging in BDSM not related to an increase in physical relationship satisfaction: $\beta = .13$, $p = .060$ Sexual arousal increased from before to during the sadomasochistic (SM) event: $d = 0.53$, $p = .037$. Negative affect decreased from before to during SM event: $d = 0.58$, $p = .014$. Stress levels decreased from before to during SM event: $d = 0.54$, $p = .022$. No significant differences between the BDSM and two control samples on levels of hostile sexism ($\eta_p^2 = .019$, $p = .185$) or expectation of sexual aggression ($\eta_p^2 = .015$, $p = .266$) BDSM had significantly lower benevolent sexism ($\eta_p^2 = .154$, $p < .001$) rape myth acceptance ($\eta_p^2 = .144$, $p < .001$), victim blaming ($\eta_p^2 = .060$, $p = .004$), and acceptance of sexual aggression ($\eta_p^2 = .043$, $p < .027$) scores than control groups
Kelsey et al.	2013	Interpersonal Factors	766 (437 females, 329 males)	Convenience sample of licensed psychotherapists residing in the US via email	Quantitative survey, online	A questionnaire designed for this study including information on socio-demographics, professional information (e.g., degree type/therapy style), beliefs about treating BDSM identified clients, and attitudes toward BDSM	
Kimberly et al.	2018	Interpersonal Factors*	238 women	Convenience sample of women online and through other media	Mixed methods survey, online	Pre-existing measures of physical satisfaction, sexual communication, and a measure (created for study) of basic BDSM behavior.	
Klement et al.	2017a	BDSM ID, Engagement, and Behaviors	67 (33 women, 26 men, 3 transgender individuals, 5 not specified)	Opportunity in-person sample of adults attending a BDSM event in Arizona	Mixed methods in-person, survey and behavioral observation	Survey created for study asked about BDSM role and experience, sexual arousal, psychological state both during and after event. Cortisol measured via saliva.	
Klement et al.	2017b	Etiology	185 (111 women, 74 men)	Convenience sample from 3 groups: MTurk, college students, and the BDSM community	Quantitative survey, online	Pre-existing measures of sexism, rape myth acceptance, victim blaming, and expectation/acceptance of sexual aggression	

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Lammers & Imhoff	2016	Etiology; BDSM ID, Engagement, and Behaviors	14,306 (9,016 women, 5,290 men)	Opportunity/convenience sample from readers of two magazines in the Netherlands	Quantitative survey, online	Information of occupational hierarchy (position), and a pre-existing measure of sexual interest	Men were more strongly aroused to sadistic thoughts than women: $d = 0.48, p < .001$. Social power related to arousal to sadistic thoughts: $B = .026, p = .011$. Power increased arousal to sadistic thought for women ($B = .032, p < .001$), but not men ($B = -.024, p = .146$) Women were more aroused by masochistic thoughts than men: $d = 0.21, p < .001$ Social power increased men's arousal to female masochism: $B = .062, p < .001$ OR (95% CI), Women (14.16 [3.02, 66.31], $p < .001$) and men (13.36 [4.12, 43.32], $p < .001$) who engaged in more sexual activities and reported hypersexuality more likely to deliberately use pain during sex compared to those with low sexual activity and low hypersexuality. In multiple regression, only openness ($\beta = .23, p < .01$) was significant predictor of sadomasochistic activities in men. In the same regression for women, more openness ($\beta = .14, p < .01$), low conscientiousness ($\beta = -.12, p < .05$) and Machiavellianism ($\beta = .20, p < .01$) all significantly predicted sadomasochistic behaviors
Långström & Hanson	2006	Demographics	2,450 (1279 men, 1171 women)	Random sample of Swedish adults via mail	Quantitative survey, in-person interviews	Measures of impersonal sex, life/sexual satisfaction, sexual history, paraphilic sexual arousal, drug use, and other risk factors	
Lodi-Smith et al.	2014	Demographics*; Psychological Correlates	595 (244 males, 334 females, 17 gender fluid)	Convenience sample online	Quantitative survey, online	Pre-existing measures of the Big 5, the Dark Triad, and sexually deviant behavior	
Luo & Zhang	2018a	Etiology; Psychological Correlates	Study 1: 363 (283 BDSM ID [190 males, 97 females], 80 non-BDSM ID/control [41 males, 39 females]) Study 2: 64 females	Study 1: Convenience online sample of Chinese BDSM and non-BDSM identified individuals Study 2: Convenience sample of 64 Chinese females that identified as submissive	Study 1: Quantitative quasi-experimental and survey design, online Study 2: Quantitative quasi-experimental and survey design, in-person	Study 1: Pre-existing measures of interpersonal reactivity, self-esteem, SES, life satisfaction, a relationship assessment, and 12 female face photographs rated for pain/enjoyment/arousal and relationship to BDSM Study 2: 48 digital pictures of female faces as stimuli and participants' reactions measured by both EEG and subjective ratings	Female submissive had lower trait empathy than switches and controls, but not dominants: $\eta_p^2 = .210, p < .001$. Female submissives had lower subjective empathetic responses than controls: $\eta_p^2 = .447, p < .001$. Study 2: Female submissives had lower subjective empathetic responses than controls: η_p^2 (average) = .665, $p < .001$.

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Luo & Zhang	2018b	Etiology; Psychological Correlates	26 females	Opportunity sample of 26 Chinese female submissives, recruited from Luo and Zhang (2018a)	Quantitative quasi-experimental and survey design, in-person	48 digital pictures of female faces as stimuli and participants' reactions measured by both EEG and subjective ratings of pain/enjoyment/arousal and the image's relationship to BDSM	Female submissives' responses in the N1, early LLP, and late LLP neural responses to other's suffering inhibited in gag vs no gag condition: N1 (measured across 6 electrodes): $\eta_p^2 = .120$, $p < .001$ - $< .05$. Early LLP (6 electrodes): $\eta_p^2 = .110$ - $.190$, $p = .006$ - $.049$. Late LLP (8 electrodes): $\eta_p^2 = .180$ - $.210$, $p = .003$ - $.007$.
Martinez	2018	BDSM ID, Engagement, and Behaviors*	202 (102 women, 96 men, 2 genderqueer)	Convenience sampling online of adults (no geographical limitations)	Mixed methods survey, online	A questionnaire created for this study asked about demographics, BDSM experiences/identification, and body satisfaction information. The qualitative component was not included in this review.	There was a significant effect of both gender ($\eta_p^2 = .041$, $p = .024$) and sexual identity ($\eta_p^2 = .081$, $p < .001$) on BDSM role fluidity. Women had higher role fluidity than men: $d = 0.39$, $p = .006$. OR (95% CI). Men more likely than women to identify as being in the dominant category: 9.52 (4.62, 19.63), $p < .001$. Women more likely than men to identify as being in the submissive category: 5.94 (3.17, 11.11), $p < .001$. Switches were not less likely to be heterosexual than submissives: 0.66 (0.31, 1.38), $p = .354$. Switches were less likely to be heterosexual than dominants: 0.11 (0.05, 0.26), $p < .001$.
Moskowitz et al.	2011	Interpersonal Relationship Factors	2,209 men (665 BDSM identified, 1,554 non-BDSM identified)	Convenience in-person sample of both BDSM Leathermen and non-Leathermen at two separate unrelated events	Quantitative, in person survey	A questionnaire created for this study and asked about Leatherman affiliation, HIV status, HIV testing, STI testing, number of partners, and condom use	OR (95% CI): Leather (BDSM) identified men were more likely than non-leather men to be HIV positive: 1.62 (1.19, 2.21), $p < .01$ Leather submissives were more likely to be HIV positive than non-leather men of any BDSM role identification: 2.19 (1.46, 3.26), $p < .001$

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Nordling et al.	2000	Etiology*; Psychological Correlates	186 (164 males, 22 females)	Opportunistic sampling from 2 BDSM clubs in Finland via mail	Quantitative survey, via mail	Questionnaire from Alison et al. (2001), Nordling et al. (2006), Sandnabba et al. (1999), & Santtila et al. (2001) about BDSM and sexual experience, childhood background, and mental/physical health	OR (95% CI). Abused participants had more of the following than non-abused: Suicide attempts: 17.18 (4.92, 59.96), $p < .001$ Psychiatric in-patient visits: 8.83 (2.69, 28.98), $p < .001$ Out-patient psychological counseling: 11.71 (2.64, 51.95), $p = .003$ Visits to GP about BDSM-related injuries: 6.88 (1.07, 44.22), $p < .010$ Likelihood of abused vs non-abused BDSM participants to engage in BDSM club behaviors: $r = .122$, $p = .003$
Nordling et al.	2006	BDSM ID, Engagement, and Behaviors	186 (164 males, 22 females)	Opportunistic sampling from 2 BDSM clubs in Finland via mail	Quantitative survey, via mail	Questionnaire from Alison et al. (2001), Nordling et al. (2000), Sandnabba et al. (1999), & Santtila et al. (2001) about BDSM and sexual experience, childhood, mental/physical health	More heterosexuality was related to a preference for masochism in men ($p = -.16$, $p = .042$) and in women ($p = -.66$, $p < .001$)
Oliveira Júnior & Abdo	2010	Demographics*; Incidence Rates; Psychological Correlates	7,022 (3,188 women, 3,834 men)	Opportunistic, in-person sampling of adults in 18 cities in 13 Brazilian states	Quantitative survey, in-person	Questionnaire created for this study that measured demographics, general life habits, sexual behavior/history/orientation, general health, and sexual difficulties	OR (95% CI). Men more likely than women to participate in more than one usual sexual behavior (USB) compared to only one unusual sexual behavior: 2.15 (2.27, 2.77), $p < .001$. Men (1.75 [1.29, 2.37], $p < .001$) and women (1.50 [1.05, 2.14], $p = .033$) with at least one USB more likely than men without an USB to show PTSD symptoms. Men (4.74 [2.39, 9.42], $p < .001$) and women (3.39 [2.38, 4.83], $p < .001$) with at least one USB more likely than those without to have ever been a victim of sexual violence. Not applicable to/calculate for results presented in review
Pascoal et al.	2015	BDSM ID, Engagement, and Behaviors*; Demographics*	68 (22 women, 46 men)	Convenience/snowball sample of BDSM identified individuals in Portugal through local BDSM organizations	Quantitative survey, online	A BDSM questionnaire created for this study asking about age of first experience, most liked practices, self-report measures of sexual dysfunction, and a pre-existing measure of sexual satisfaction	
Rahman & Symeonides	2008	Etiology	200 men	Opportunistic/snowball in-person sampling from adult men in the London area	Quantitative survey, in-person	Pre-existing measures of sexual fantasy (WSFQ), handedness, sibling sex composition, digit ratios	Those with more paraphilic interest had more older brothers than those with low paraphilic interest: $d = 0.49$, $p = .001$. High paraphilics had trend toward having more non-right handedness than low paraphilics: $d = 0.26$, $p = .070$

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Rehor	2015	BDSM ID, Engagement, and Behaviors*, Demographics*	1,580 women	Opportunistic/convenience sampling through kink communities and online BDSM pages. There was no geographic limitation	Quantitative survey, online	Bespoke measure of interest/participation in a wide range of BDSM, role-play, erotic, exhibitionistic, fetishistic, and other sexual behaviors	Not applicable to/calculable for results presented in review
Richters et al.	2014	Demographics; Incidence Rates	20,094 (9,985 men, 9,730 women)	Representative sample of Australian men and women recruited via telephone	Quantitative survey, via telephone interview	Demographics, and bespoke questions about masturbation, pornography consumption, a range of sexual behaviors (e.g., BDSM, sex toy use, role-play, anal, etc.), and paying for sex.	OR (95% CI) for current study: Women participated less than men in BDSM (0.63 [0.43–0.92], $p = .017$) but not in role play (1.15 [0.89–1.49], $p = .292$). OR (95% CI) of percentage of sample indicating participation in following activities in Richters et al. (2003) compared to the percentage of the Richters et al. (2014): BDSM, men: 1.42 (0.94–2.14), $p = .095$ BDSM, women: 1.29 (0.70–2.38), $p = .422$ Role play, men: 2.18 (1.58–3.02), $p < .001$ (higher in 2014 cf. 2003) Role play, women: 2.62 (1.89–3.64), $p < .001$ (higher in 2014 cf. 2003)

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Richters et al.	2008	Etiology; Demographics; Psychological Correlates	19,307 (10,173 men, 9,134 women)	Representative sample of Australian men and women recruited via telephone	Quantitative survey, via telephone interview, a nested study in Richters et al. (2003).	Survey from Richters et al. (2003) and further questions about participation in less common sexual activities (e.g., BDSM), history of sexual coercion, psychological wellbeing, and sexual difficulties	OR (95% CI) for the experience/engagement in the following among BDSM vs non-BDSM participants: Sexual coercion before 16: Men: 2.03 (0.75, 3.38), $p = .228$ Women: 0.99 (0.36, 3.03), $p = .987$ Psychological distress: Men: 0.33 (0.14, 0.80), $p = .010$ (BDSM group lower) Women: 2.20 (0.88, 6.26), $p = .118$ Masturbation (lifetime): Men: 1.46 (0.49, 4.34), $p = .493$ Women: 3.89 (1.37, 11.07), $p = .011$ (BDSM higher) Bisexual experience: Men: 4.44 (2.96, 9.33), $p < .001$ (BDSM higher) Women: 5.69 (1.97, 16.42), $p = .001$ (BDSM higher) More than 50 sexual partners: Men: 3.13 (1.28, 7.66), $p = .012$ (BDSM higher) Women: 6.76 (1.93, 23.69), $p = .003$ (BDSM higher) Sexual difficulties (8 were measured): Men: 0.57 (0.24, 1.33) - 2.93 (0.78, 11.00), $p = .110$ - .997 Women: 0.58 (0.22, 1.56) - 1.81 (0.73, 4.46), $p = .198$ - .897 OR (95% CI): There were no differences between men and women in the engagement of BDSM (0.68 [0.36–1.29], $p = .239$) or role play (0.94 [0.64–1.37], $p = .730$) Dominants and submissives did not differ in overall dyadic adjustment/relationship satisfaction: $d = 0.10$, $p = .603$. BDSM participants scored above the criterion variable for dyadic adjustment indicating relationship distress: $d = 0.32$, $p < .001$. Thwarted belongingness and perceived burdensomeness mediated the relationship between shame and suicidal ideation in BDSM practitioners, $R^2 = .57$, $p < .001$
Richters et al.	2003	Incidence Rates; Psychological Correlates	19,307 (10,173 men, 9,134 women)	Representative sample of Australian men and women recruited via telephone	Quantitative survey, via telephone interview	Bespoke survey asking about demographic information, autoerotic, esoteric, and other sexual behaviors (e.g., role playing, anal sex)	
Rogak & Connor	2017	Interpersonal Factors	163 (75 males, 84 females, 3 transgender individuals)	Convenience/snowball sample of BDSM participants in committed relationships from two BDSM related websites	Quantitative survey, online	An inventory of BDSM participation was created for this study, and was preceded by a pre-existing measure of dyadic adjustment	
Roush et al.	2017	Demographics; Interpersonal Factors; Psychological Correlates	321 (198 males, 108 females, 9 transgender individuals, 4 other identified)	Convenience sample of individuals who endorsed BDSM involvement from BDSM-related web forums	Quantitative survey, online	Demographics and pre-existing measures of suicidal ideation, depression, interpersonal needs, and other measures of well being	

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Rye et al.	2015	Interpersonal Factors; Psychological Correlates	94 females	Convenience sample of female students in an undergraduate research experience group	Quantitative survey, in-person survey during a larger testing session	Two newspaper-like articles about BDSM (stimuli) and accompanied by questions about perceptions of BDSM. Pre-existing measures of sexual communication and comfort, sexual anxiety and sexual liberalism	Erotophilia (via scores on 7 measures) was positively related to personal feelings about BDSM ($\eta^2 = .109 - .462$, $p < .001$) and to comfort in discussing BDSM ($\eta^2 = .058 - .303$, $p < .001 - .05$). Personal feelings about discussing BDSM did not change based on whether participants received a positive or negative media portrayal passage, $\eta_p^2 = .000$, $p = .863$.
Sagarin et al.	2009	Interpersonal Factors*	Study 1: 13 (6 women, 7 men) Study 2: 45 (19 women, 26 men)	Study 1 & 2: Opportunistic in-person sample of attendees of a BDSM event in Arizona	Study 1 & 2: Quantitative, in-person survey, and hormone level testing	Study 1 & 2: Researchers created two surveys- one for before a scene took place, and one for after- that asked about BDSM roles, anticipation/result of the scene, and measures of their perception of scene partner. Salivary testosterone where samples taken before and after the scene occurred.	Study 1: Between baseline and 20 minutes after the BDSM scene, bottoms' cortisol levels rose significantly ($\eta_p^2 = .326$, $p = .040$), but tops levels did not ($\eta_p^2 = .000$, $p > .050$). Study 2: Between baseline and 20 minutes after the BDSM scene, bottoms' cortisol levels rose significantly ($\eta_p^2 = .236$, $p = .002$), but tops levels did not ($\eta_p^2 = .000$, $p > .050$). One measure of relationship satisfaction/closeness increased significantly from before to after the BDSM scene, regardless of how scene went ($p < .001$). Women responded faster to sex primed submissive words than neutral primed submissive words: $\eta_p^2 = .110$, $p = .030$. Women responded slower to sex primed dominant words than to neutral primed dominant words: $\eta_p^2 = .360$, $p < .001$. There was no difference in men's response time to sex primed submissive and neutral primed submissive words: $\eta_p^2 = .068$, $p = .190$. Men responded slower to sex primed dominant words than neutral primed dominant words: $\eta_p^2 = .508$, $p < .001$.
Sanchez et al.	2006	Etiology	36 females	Convenience, in-person sample of undergraduate females at the University of Michigan	Quantitative behavioral observation, quasi-experimental design	A lexical-decision task with eye tracking was created for use in this study with stimuli that were associated with sex or dominance/submission	Women responded faster to sex primed submissive words than neutral primed submissive words: $\eta_p^2 = .110$, $p = .030$. Women responded slower to sex primed dominant words than to neutral primed dominant words: $\eta_p^2 = .360$, $p < .001$. There was no difference in men's response time to sex primed submissive and neutral primed submissive words: $\eta_p^2 = .068$, $p = .190$. Men responded slower to sex primed dominant words than neutral primed dominant words: $\eta_p^2 = .508$, $p < .001$.

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Sandnabba et al.	1999	BDSM ID, Engagement, and Behaviors	164 males	Opportunistic sampling from 2 BDSM clubs in Finland via mail	Quantitative survey, via mail	Questionnaires from Alison et al. (2001), Nordling et al. (2000/2006), Sandnabba, Santtilla, Nordling, Beetz, and Alison (2002), & Santtilla et al. (2001) about BDSM and sexual experience, childhood background, and mental/physical health	Gay men were older than heterosexual men at age of first awareness of BDSM interest ($\eta_p^2 = .093, p = .004$) and at age of first BDSM experience ($\eta_p^2 = .086, p = .006$). There was a non-significant tendency for heterosexual men to be masochists and gay men to be sadists. A significant proportion of participants had lighter BDSM sessions than they wanted ($\phi = .647, p < .001$) and believed they wanted heavier sessions than their partners ($\phi = .410, p < .001$). Zoophilic oriented participants were more likely to have participated in more sadomasochistic behaviors than matched non-zoophilic BDSM controls, including the use of knives ($\phi = .519, p < .01$), skin branding ($\phi = .467, p < .05$), and urologia ($\phi = .430, p < .05$). Not applicable to/calculable for results presented in review
Sandnabba et al.	2002	BDSM ID, Engagement, and Behaviors	12 males	Opportunistic sampling from 2 BDSM clubs in Finland via mail This was a sub sample from a larger study	Quantitative survey, via mail	Questionnaires from Alison et al. (2001), Nordling et al. (2000), Sandnabba et al. (1999), & Santtilla et al. (2001) about BDSM and sexual experience, childhood background, and mental/physical health	
Santtilla et al.	2002	BDSM ID, Engagement, and Behaviors*	186 (164 males, 22 females)	Opportunistic sampling from 2 BDSM clubs in Finland via mail	Quantitative survey, via mail	Questionnaires from Alison et al. (2001), Nordling et al. (2006), Sandnabba et al. (1999), & Santtilla et al. (2001) about BDSM and sexual experience, childhood background, and mental/physical health	
Santtilla et al.	2001	Etiology	164 males	Opportunistic sampling from 2 BDSM clubs in Finland via mail	Quantitative survey, via mail	Questionnaires from Alison et al. (2001), Nordling et al. (2006), Sandnabba et al. (1999), & Santtilla et al. (2002) about BDSM and sexual experience, childhood background, and mental/physical health	Likelihood of sadistic participants having more ambivalent and less secure attachment and masochists having more secure and less ambivalent attachment: <i>Cramer's V</i> = .401, $p = .006$ Ns. relationship between feminist beliefs and forceful sexual fantasy ($r^2 = .014, p = .053$) or between CSA and sex guilt ($r^2 = .002, p = .318$). Lower sex guilt related to more erotophilia ($r^2 = .645, p < .001$) and forceful sexual fantasies ($r^2 = .071, p < .001$). Higher erotophilia was related to more forceful sexual fantasies: $r^2 = .132, p < .001$. Higher erotophilia was related to lower sex guilt: $r^2 = .645, p < .001$.
Shulman & Home	2006	Etiology; Psychological Correlates	261 women	Convenience online sample of adult women residing in US	Quantitative survey, online		

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Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Tomassilli et al.	2009	Demographics; Incidence Rates	347 women	Convenience in-person sample of gay and lesbian women at two community events in New York City	Quantitative survey, in-person	A measure of demographics and engagement in bondage/domination, SM, photo/video exhibitionism, and asphyxiation/breath play was created for this study	OR (95% CI) for participation in kinky sexual behaviors for lesbian vs bisexual women: Sadomasochism: 0.66 (0.34, 1.27), $p = .211$ Bondage and domination: 0.65 (.37, 1.16), $p = .144$ Photo or video exhibitionism: 0.35 (0.19, 0.64), $p < .001$ (bisexual women more) Breath play: 1.00 (0.28, 3.58), $p = .647$ Women who engaged in the following sexual behaviors were younger at their age of first sexual behavior than women who did not engage in these: Bondage and domination: $d = 0.35$, $p = .004$ Sadomasochism: $d = 0.34$, $p = .019$ Sexual sadism was significantly positively correlated with: Narcissistic entitlement and exploitativeness: $r^2 = .032$, $p < .01$ Four of five measures of psychopathy: $r^2 = .058 - .194$, $p < .01$ Schizotypal personality disorder symptoms: $r^2 = .078$, $p < .01$ Antisocial personality disorder symptoms: $r^2 = .584$, $p < .01$ Borderline personality disorder symptoms: $r^2 = .260$, $p < .01$ Dominants were significantly more likely than submissives to indicate BDSM was serious (cf. casual) leisure on 4/6 serious leisure items: <i>Cramers's V</i> , .055-.070, $p < .001 - .034$
Watts et al.	2019	Psychological Correlates	608 (443 women, 165 men)	Convenience sample of undergraduate students from two universities in the Southeastern US	Quantitative survey, distribution/data collection method not specified	Measures of paraphilic interests and existing measures of personality disorder symptoms, erotophilia, psychopathy, and narcissism	
Williams et al.	2016	Etiology	935 (293 men, 561 women, 15 transgender individuals, 50 queer or gender fluid)	Convenience online sample of adults who regularly practiced BDSM	Quantitative survey, online	A measure of demographics, BDSM role identification, and both serious and casual leisure was developed for use in this study	

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Williams et al.	2009	Incidence Rates; Psychological Correlates	Study 1: 103 men Study 2: 88 men	Study 1 & 2: Convenience, in-person sample of undergraduate students from a large Western university	Study 1 & 2: Quantitative survey, in-person	Study 1: A demographic questionnaire including questions about pornography use, and a pre-existing measure of deviant fantasies and behaviors Study 2: In addition to the survey from study 1, participants completed Big 5 and Dark Triad measures	Study 1: Positive relationship between sum deviant behaviors and fantasies: $r^2 = .504, p < .001$ Study 2: Positive relationship between sum deviant behaviors and fantasies: $r^2 = .518, p < .001$ Sadistic sexual fantasies were positively related to narcissism ($r^2 = .096, p = .003$) and psychopathy ($r^2 = .078, p = .008$) Bondage fantasies were positively related to psychopathy ($r^2 = .058, p = .024$) Sadistic sexual behaviors were also positively related to narcissism ($r^2 = .053, p = .031$) and psychopathy ($r^2 = .058, p = .024$) Bondage sexual behaviors were positively related to psychopathy ($r^2 = .058, p = .024$) Submissives had more anxious attachment than dominants, neither differed significantly from switches: $\eta_p^2 = .038, p = .038$ Submissives, switches, and dominants did not differ in avoidant attachment: $\eta_p^2 = .006, p = .543$ Non-BDSM females had lower relationship confidence than BDSM females: $\eta_p^2 = .016, p = .001$ BDSM participants had higher scores of openness to experience ($\eta_p^2 = .045, p < .001$), extraversion ($\eta_p^2 = .008, p < .05$), and conscientiousness ($\eta_p^2 = .019, p < .001$) and lower scores on rejection sensitivity ($\eta_p^2 = .022, p < .001$), neuroticism ($\eta_p^2 = .033, p < .001$), and agreeableness ($\eta_p^2 = .018, p < .001$) than non-BDSM controls. Dominants and switches scored higher on openness to experiences than submissives: $\eta_p^2 = .045, p < .001$ Submissives scored higher on agreeableness than dominants: $\eta_p^2 = .018, p < .001$.
Wismeijer & Van Assen	2013	Demographics; Psychological Correlates	902 (464 males, 438 females)	Convenience sample of BDSM respondents from a BDSM website in the Netherlands	Quantitative survey, online	Demographics and information about BDSM role, pre-existing measures of attachment, personality, rejection sensitivity, and subjective well-being	

(Continued)

Table 2. (Continued).

Author(s)	Pub. Year	Appears in Review Section	n	Sampling Strategy	Study Design/Data Collection Method	Primary Measures	Outcomes of Interest and Indicative Effect Sizes
Yost	2010	Interpersonal Factors	Study 1: 213 (150 women, 63 men) Study 2: 258 (140 men, 118 women)	Study 1: Convenience in-person sample of undergraduate students from a US liberal arts university Study 2: Convenience in-person sample of undergraduate students from a large public US university	Study 1 & 2: Quantitative survey, online	Study 1: Measure of attitudes about sadomasochism and pre-existing measures of social desirability, authoritarianism, sexual conservatism, and rape myth acceptance Study 2: Validation of model in study 1 and existing measures of social desirability, authoritarianism, and sexual orientation attitudes <i>The samples from study 1 & 2 were combined for the analyses presented in review</i>	In a multiple regression, more homophobia ($\beta = .21, p = .030$), sexual conservatism ($\beta = .38, p < .001$), social conservatism, as measured by right wing authoritarianism ($\beta = .18, p = .08$), and more rape myth acceptance ($\beta = -.15, p = .040$) predicted more prejudice toward sadomasochism practitioners People who engaged in sadomasochism had less prejudice toward sadomasochism than those who did not: $d = 1.2, p < .001$ People who knew others that engaged in BDSM had less prejudicial attitudes than those who did not: $d = 0.84, p < .001$ As knowledge about sadomasochism increased, attitudes become more positive on all four sub-scales: $r^2 = .010 - .032, p < .001 - .05$ OR (95% CI): Women were significantly more likely than men to identify as submissive: 3.33 (2.02, 5.50), $p < .001$ Men were significantly more likely than women to identify as dominant: 3.85 (2.13, 6.94), $p < .001$ Women were not more likely than men to be switches: 0.79 (0.46, 1.35), $p = .467$ Domination was more likely to appear in men's sexual fantasies than in women's: $d = .38, p = .02$ No difference in the frequency of appearance of submission in sexual fantasies between men and women $d = .25, p = .11$ Women were more likely to portray themselves as submissive in their fantasies and men were more likely to portray themselves as dominant: $\eta_p^2 = .046, p = .006$
Yost & Hunter	2012	Demographics	272 (144 women, 128 men)	Convenience sample of self-identified BDSM participants recruited online and in US based BDSM events/organizations	Quantitative survey, online	A bespoke measure that asked about BDSM self-identification, role, and participation	
Zubriggen & Yost	2004	Etiology; Incidence Rates	162 (85 men, 77 women)	Convenience sample of adults from a midwestern US city via media advertisements/notices	Mixed methods survey, via mail	Responses to open-ended questions about sexual fantasies; pre-existing measures on rape myth acceptance, attitudes toward women, sexual beliefs, and social desirability. Fantasies were labeled categorically based on content (e.g., domination/submission)	

*Effect sizes either could not be calculated for all outcomes of interest in this section or they were not applicable to results presented

Dawson, Bannerman, and Lalumière (2016) found men indicated significantly more arousal than women for fetishism (28% vs 11%) and sadism (19% vs 10%). For masochism, women reported more arousal (17%) than men (15%). Similarly, Joyal et al. (2015) reported that women (64.6%) reported fantasizing about being dominated significantly more than men (53.5%), while men (59.6%) reported fantasizing about dominating someone significantly more than women (46.7%). Focusing on other aspects of BDSM play, a 2017 study (Joyal & Carpentier) found that significantly more women (27.8%) than men (19.2%) reported desire to engage in masochism and 9.5% of men and 5.1% of women expressed desire for sadism. Fetishism was found to be an interest for 40.4% of men and 47.9% of women.

As expected, prevalence rates of BDSM behaviors were lower than the prevalence of BDSM fantasies for both males and females. In general, research has found that men are more likely than women to report engaging in unusual sexual behaviors (Holvoet et al., 2017; Oliveira Júnior & Abdo, 2010). One of the few studies that did not find any significant sex differences in prevalence rates of BDSM behaviors was an Australian study that collected data from a nationally representative sample of men and women aged 16–59. This found that 2% of men and 1.4% of women had participated in BDSM in the past 12 months (Richters et al., 2003). Researchers also asked if they had participated in role play or dressing up, to which 4% of men and 3.7% of women answered affirmatively. In relation to specific BDSM behaviors, Joyal and Carpentier (2017) found that more women (23.7%) reported experiencing sexual masochism than men (13.9%). Two studies on bisexual and gay women found that about 19% reported some engagement in sadomasochism, 33% participated in bondage and domination, 22.2% in photo or video exhibitionism, and 5.2% in breath play (Bailey, Farquhar, Owen, & Whittaker, 2003; Tomassilli, Golub, Bimbi, & Parsons, 2009).

Etiological theories of BDSM

Recent empirical literature has aimed to test the psychoanalytic, social, and bio-medical models, as well as offer new etiological theories for the development of BDSM interests. We have sequestered these areas to their own sub-sections below. However, here it is worth mentioning a key study by Cross and Matheson (2006) which tested four possible etiological theories in one study: psychopathological, radical feminist, escape-from-self, and psychoanalytic. The psychopathology model hypothesizes that BDSM interests are abnormal traits caused by physical or psychological disease and thus should covary with measures of psychopathology. The feminist model argues that participation in BDSM is inherently misogynistic, regardless of which sex assumes which BDSM role, and pleasure from degradation or torture is indicative of an internalized patriarchy. The escape-from-self theory (Baumeister, 1988) posits that masochism provides escape from excessive levels of self-control. As successful people (in career or personal life) may have high levels of self-control, this model predicts that successful individuals will tend more toward masochism than sadism because they

desire to relinquish their own control. People who identify as sadistic are doing so not to relinquish the self, but out of a need to assert control and bolster their own self-concept. Psychoanalytic theory suggests that BDSM traits may be linked to sexual guilt as compensatory mechanisms for a dysfunctional superego, or that a weak superego might result in greater thrill-seeking as a compensation (Freud, 1953).

To test these competing hypotheses, Cross and Matheson (2006) compared people who identified as either a sadist, masochist, or switch, with a non-BDSM control group. None were supported. Masochists were not more prone to distress or mental instability than other groups. Authoritarianism scores were significantly higher among the control group compared to switches. In general, all groups held pro-feminist attitudes, suggesting that BDSM interests are not due to internalized patriarchal norms (cf., Shulman & Home, 2006). Another study found that BDSM practitioners, when compared to two non-BDSM control groups, did not significantly differ on hostile sexism and acceptance of sexual aggression, and had lower levels of benevolent sexism, rape myth acceptance, and victim blaming (Klement, Sagarin, & Lee, 2017b). Although one study found that women implicitly associated sex with submission, contrary to the feminist theory, men did not implicitly associate dominance with sex (Sanchez, Kiefer, & Ybarra, 2006). As for the escape-from-self hypothesis, there were no significant differences in scores on measures of risk-taking behaviors (Cross & Matheson, 2006). Sadists did not differ in employment (or success level) from non-BDSM controls, and masochists were not more inclined to engage in escapist behaviors. Sexual guilt and thrill-seeking levels did not differ between sadists, masochists, and switches, offering little empirical support for psychoanalytic predictions (Cross & Matheson, 2006).

Child abuse and trauma

Despite lack of scientific support, psychoanalytic theories for BDSM persist in popular culture. These variously take the form of a belief that a proclivity for BDSM is anchored in childhood sexual abuse (CSA, or that early abuse cascades into psychosexual, developmental or other personality dysfunction which results in BDSM; Freud, 1962, 1924/1961, 1938). Thus, psychoanalytic theory predicts that those with BDSM interests should have underlying psychological and personality dysfunction, as these interests are rooted in trauma that will result in mental health issues. However, studies linking CSA and sadomasochistic preferences tend to be case studies from those with other psychological problems (Blizard, 2001; Rothstein, 1991). Thus, it is difficult to tease apart the overlap between CSA, other mental health disorders, and BDSM traits.

Contrary to the prediction that most persons with BDSM interests should have experienced some form of trauma, BDSM practitioners had comparable PTSD and trauma-related phenomena scores and incidence rates of trauma similar to population averages (8%), though more submissiveness was associated with an increased PTSD symptom score (Connolly, 2006). BDSM practitioners did not show higher borderline personality or dissociative identity disorder

symptoms. Similarly, a population study found no link between psychopathology, abuse, and BDSM (Richters, de Visser, Rissel, Grulich, & Smith, 2008). When comparing those who had practiced BDSM in the last 12 months to those who had not, engagement in BDSM was unrelated to having been sexually coerced before the age of 16. Men who engaged in BDSM were also significantly less likely to have psychological distress and women who engaged in BDSM did not differ significantly in psychological distress to those who had not.

Shulman and Home (2006) tested the guilt reduction theory, which hypothesizes that women with high sex guilt have more forceful sexual fantasies as the fantasies absolves them of the guilt they might experience if they initiated or said yes to a sexual scenario. Sex guilt refers to the feeling of shame or embarrassment one might experience due to participating in or fantasizing about sexual activity. Guilt reduction theory stipulates that those with high sex guilt will feel less guilty if they are in a sexual scenario where they are unable to reject sexual advances as they do not have the burden of asking for (or even saying yes to) sex. CSA may result in high levels of sex guilt, which would then cascade into fantasies of force (related to the domination and submission aspects of BDSM). However, results indicated that CSA was not directly related to sex guilt but did have a direct path to erotophilia (an individual's general propensity to respond to sexual cues). Most notable was the finding that low levels of sex guilt and high levels of erotophilia predicted forceful sexual fantasies. Stronger feminist beliefs coupled with low levels of guilt were also related to erotophilia and more sexual experience. This indicated that, although CSA may be related to forceful sexual fantasies, it is not the only potential origin of these fantasies.

Nordling, Sandnabba, and Santtila (2000) tested the hypothesis that BDSM practitioners who experienced CSA would seek out sadomasochistic relationships because they viewed violence as a normal part of sexuality, show greater psychological distress, and have poorer social adjustment. Both male and female BDSM practitioners were more likely to have experienced CSA than the general population (7.9% males in the current sample compared to 1-3% in the population; 22.7% to 6-8% for females, respectively). However, it is important to note that most (90.4%) BDSM practitioners in this study reported no abuse at all, providing little support for the theory that *most* BDSM practitioners have previously experienced abuse. The association between CSA and BDSM should also be interpreted with caution given the small sample size of abused participants. More recently, a study focused on investigating the role of childhood trauma in kinky sexual behavior in adults found that trauma did not significantly predict either dominance or submissive sexual behaviors within a sample of kink-identified participants, indicating that trauma is not a common precipitating factor of BDSM interests (Hillier, 2019).

Attachment

Some psychodynamic accounts propose that children who are abused develop poor attachment, which results in masochistic or sadistic ego states used to preserve their self-concept and attachment to parents. One study on 164 men from two

BDSM clubs indicated that attachment (based on retrospective descriptions of parental relationships) to the mother (but not the father) was significantly correlated with BDSM orientation. Specifically, sadistic participants were more likely to have avoidant attachment and less likely to have secure attachment, and masochistic participants were more likely to have secure attachment and less likely to have avoidant attachment (Santtila, Sandnabba, & Nordling, 2001). The distributions of attachment styles in this sample were similar to population samples. Wismeijer and Van Assen (2013) reported similar results (i.e., no significant differences in attachment styles between BDSM sub-groups and controls; see also Connolly, 2006; Richters et al., 2008). Overall, the findings offer weak support for attachment hypotheses.

Disinhibition

In a less psychopathology-focused study, Lammers and Imhoff (2016) put forth the disinhibition hypothesis, which states that having social power leads to behavioral disinhibition; powerful people are more likely to act impulsively because they can. Consistent with the disinhibition hypothesis, men, who had more social power (determined by their position at their job, with managerial or leadership roles ranked as being higher in social power than hourly-wage or non-leadership positions), were significantly more aroused by sadistic thoughts. Results demonstrated that social power was positively related to arousal by sadistic thoughts, and this effect was moderated by gender (controlling for age). The same was found for women and masochism. Position of power increased arousal to sadistic thoughts among women but not men. Additionally, there was a small positive effect of social power on masochistic arousal for men, indicating that men's increase in social power was linked with arousal to female-associated masochism.

A related hypothesis argued that BDSM preferences may be related to a compensation for a lack of power in childhood (Damon, 2003). Individuals who perceive a lack of power in daily life may seek out opportunities to show dominance by exerting control over others. Contrary to the hypothesis, submissives, not dominants, were found to have lower levels of self-esteem and higher levels of sexism (Malovich & Stake, 1990; Valentine, 1998). Thus, the hypothesis of using dominance as a way to compensate for low levels of self-esteem also appears unsupported.

Neurological and biological differences

Also critical of the psychopathological model, Luo and Zhang (2018a) quantified neural empathetic responses of BDSM practitioners. The use of pain in BDSM led early researchers to view these practices as linked to psychopathy, which has been related to diminished empathy, and antisocial, and borderline personality disorder (Soderstrom, 2003). Luo and Zhang (2018a) found that female submissives showed reduced trait empathy and subjective empathetic response and more BDSM experiences were associated with even more reduction in empathy. Frequent exposure to pain inflicting situations may diminish empathic responses over time, as has been demonstrated in medical professionals frequently exposed to seeing those in pain (Cheng et al., 2007).

Luo and Zhang (2018b) then looked at the potential influence of humiliation (via wearing a ball gag) and bondage on female submissives' empathetic neural response. Results showed that the subjective feeling of humiliation and objective loss of ability to move facial muscles due to the gag decreased their empathetic response, suggesting that the lower empathetic response was context dependent. Thus, any diminished empathetic response may be due to, instead of the cause of, BDSM practices.

Other studies have found relationships between neurodevelopmental factors and paraphilic preferences in men. Rahman and Symeonides (2008) found that greater paraphilic interests were associated with greater non-right handedness and numbers of older brothers (a potential marker of prenatal events which may influence brain development, such as maternal immune responses) in men. However, the associations were small and Dawson et al. (2016) did not replicate the association between paraphilic interests and non-right handedness. Conversely, it was weakly, but non-significantly, associated with paraphilic interest in women. This may be because neurodevelopmental markers may be related to paraphilic disorders (like pedophilia) rather than to low-level atypical sexual interests. However, we found no literature (using our criteria) on genetic (e.g., twin studies), hormonal (e.g., studies on the role of sex steroids) or other psychobiological correlates.

Leisure

One study tested the novel theory that BDSM may simply be a leisure or recreational activity (Williams, Prior, Alvarado, Thomas, & Christensen, 2016). Leisure is defined as an activity, context, or time period with positive psychological benefits that is also personally meaningful, freely chosen, and intrinsically motivated (Kleiber, Walker, & Mannell, 2011). Similarly, recreation involves engaging in pleasurable activities, usually during one's leisure time. The notion of BDSM as leisure could help explain why some people, like those that identify as asexual, do not view their participation in BDSM as erotic or sexual. Because BDSM practitioners frequently refer to their practices with terms like toys, games, play, or fantasy, it is conceivable that this can be seen as leisure and have no deeper, pathological, etiological origin for many practitioners. Participants were not given definitions of either recreation or leisure but were simply asked whether they considered BDSM to fit into either of these categories. Sixty-four percent of participants reported that BDSM participation was recreational and 58% reported that it was leisure most or all of the time. Dominant participants were significantly more likely than submissives to rate BDSM activities to be more serious, rather than casual, on four of the six items related to this continuum. This may be due to their need to master certain skills (like handling of whips) and their responsibility to keep their submissive safe during a scene.

Evolutionary hypotheses

Other causal hypotheses include evolutionary accounts which argue that sexual arousal by a power difference between partners is a successful mating strategy. Arousal by a higher ranking and dominant male can facilitate mating with

a partner with good genes and good resources (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004; Llaurens, Raymond, & Faurie, 2009). In support, Jozifkova, Bartos, and Flegr (2012) cited findings where hierarchically incongruent pairs had more offspring than those with equal status, regardless of which gender partner was higher ranking. If this strategy does not work, individuals may also adopt an alternative, opportunistic strategy in order to maximize their potential for reproductive success. Thus, dominance and submission may come from a dominance strategy, and preference for bondage may come from an opportunistic strategy (i.e. putting a sexual partner in a position where they are physically unable to get away from the encounter). As predicted, for males, dominance scores correlated with questions pertaining to a desire for hierarchical disparity between partners, but the opportunistic score (representing a preference for bondage) was not correlated with any of the items. In women, dominance only correlated significantly with two of the eight questions asking about preference for hierarchical disparity in relationships and no questions about hierarchical disparity preference correlated significantly with opportunism scores.

A model based on evolutionarily advantageous resource control was also tested (Hawley & Hensley, 2009). People were categorized as having either 1) coercive strategies, where people gain access to resources by simply taking them as a show of social dominance, 2) prosocial strategies, where people gain access to resources through cooperation, or 3) a combination of the two (bi-strategic). The researchers predicted that women who are more dominant (or adopt a coercive strategy) would show more forceful sexual fantasies than submissive women because they are drawn to dominant men that they themselves are competitive enough to win over. The first study found that women's predilection for forceful submission was greater than men's preference to fantasize about forceful domination. Bi-strategic women showed the greatest divergence between preferences: they preferred to be dominated more than they preferred to dominate, supporting the initial hypothesis. As predicted, dominant men were more likely to entertain dominance fantasies.

Sex drive

Although some research (Lammers & Imhoff, 2016) points to BDSM being associated with subversion of gender norms, sex differences remain. Men are consistently found to report a higher incidence of atypical sexual interests, including BDSM (Dawson et al., 2016; Joyal et al., 2015). The exception appears to be masochism, in which more women than men report having this fantasy (Joyal et al., 2015). Dawson et al. (2016) found the men reported arousal to sadistic sexual interests more often than women, consistent with other studies. However, sex drive was an important mediator of these associations, indicating that higher sex drive is a possible etiological factor in the development of BDSM interests.

As has been demonstrated, it seems to be highly unlikely that there is a single cause of BDSM interests. There is good evidence that BDSM practitioners do not suffer from more psychological problems than the general population (Connolly, 2006; Cross & Matheson, 2006; Richters et al.,

2008) and do not show levels of empathetic neural responses associated with psychopathy (Luo & Zhang, 2018a, 2018b), as is predicted by psychopathological and psychoanalytic models. If CSA is a contributing etiological factor in a small subset of BDSM practitioners (Nordling et al., 2000), it is more likely to be related to hypersexuality or erotophilia than BDSM interests themselves (Shulman & Home, 2006). Though many of the studies reviewed were limited by the use of self-selected sampling, those with large, representative samples (Richters et al., 2014, 2008, 2003) have reached similar conclusions.

In sum, causal factors may include BDSM engagement for leisure (Williams et al., 2016), influence of high sex drive (Lammers & Imhoff, 2016) to mate selection techniques (Jozifkova et al., 2012) and positions of social power (Hawley & Hensley, 2009). However, the cross-sectional nature of these studies makes causal pathways difficult to determine and the use of self-selected samples limit generalizability. Notable is the lack of good research on genetic, hormonal, and neural correlates. Collectively, data suggest there is no singular causal factor of BDSM, but rather multiple factors.

Demographic characteristics of BDSM practitioners

The majority of studies on BDSM practitioners have found that they are typically white, well-educated, and young (e.g., Brown, Roush, Mitchell, & Cukrowicz, 2017; Connolly, 2006; Damon, 2003; Hébert & Weaver, 2014; Lodi-Smith, Shepard, & Wagner, 2014; Oliveira Júnior & Abdo, 2010; Pascoal, Cardoso, & Henriques, 2015; Richters et al., 2014). Only two studies diverged from this demographic pattern (Joyal, 2015; Wismeijer & Van Assen, 2013, although the latter still reported greater education levels).

Additionally, BDSM practitioners have higher rates of non-monogamy. One study found 40% reported some form of non-monogamous relationship (Rehor, 2015), another found that 31.4% practiced BDSM with someone other than their primary romantic partner (Hébert & Weaver, 2014), a third found that 32.7% identified as non-mongamous or polyamorous (Connolly, 2006), and a fourth reported rates of polyamory of around 14% (Botta, Nimbi, Tripodi, Silvaggi, & Simonelli, 2019). This may be related to findings by Wismeijer and Van Assen (2013) that non-BDSM females scored significantly lower on confidence in relationships than the female BDSM practitioners. However, because BDSM is a niche sexual interest, it may lead to higher rates of being single as it becomes more difficult to find a partner with shared interests (Ahlers et al., 2011).

Identifying as non-heterosexual is also related to BDSM. One study found that women with masochistic interests reported greater same sex attraction than women with conventional sexual interests (Chivers, Roy, Grimpos, Cantor, & Seto, 2014). Another study found that BDSM involvement was significantly more likely for bisexual men and gay men and women, and those with any BDSM experience were more likely to report bisexual experiences (Richters et al., 2008). Hébert and Weaver (2014) found that 30.7% of BDSM practitioners identified as bisexual, while 4.9% identified as

homosexual. Connolly (2006) found that 34.1% identified as exclusively heterosexual, while Botta et al. (2019) reported that 39.7% of men and 30.4% of women identified as exclusively heterosexual.

Sexual experience and functioning

When it comes to sexual experience, the results indicate that BDSM practitioners typically have more partners over their lifetime (Oliveira Júnior & Abdo, 2010; Richters et al., 2008), have more sexual experience, and have sex at an earlier age (Oliveira Júnior & Abdo, 2010; Tomassilli et al., 2009). There is little evidence for an association between BDSM practices and sexual difficulties (Richters et al., 2008). For example, BDSM-identified men reported significantly lower levels of sexual distress, and arousal did not differ between BDSM and non-BDSM sexual contexts (Pascoal et al., 2015). Women reported significantly less distress about maintenance of arousal in BDSM contexts than non-BDSM contexts, though overall sexual satisfaction did not differ.

However, Långström and Hanson (2006) reported an association between impersonal sex, hypersexuality, and paraphilic interests, such that hypersexuality was related to the deliberate use of pain during sex. Oliveira Júnior and Abdo (2010) also reported that those with at least one atypical sexual behavior reported higher rates of STIs, and men reported a higher incidence rate of HIV/AIDS. Another study in a gay leather community found that those who identified as leather men were 61% more likely than a non-leather control group to be HIV positive (Moskowitz, Seal, Rintamaki, & Rieger, 2011). Those who identified as submissive were also more likely to be HIV-positive than non-leather identified participants. Further investigations are needed on the relationship between BDSM involvement and physical and sexual health.

BDSM identification, engagement, and behaviors

Arousal Patterns

Previous research (Chivers, Seto, & Blanchard, 2007; Suschinsky, Lalumière, & Chivers, 2009) has indicated that heterosexual women do not show gender or activity specific arousal patterns, unlike men (Seto, Lalumière, Harris, & Chivers, 2012). One study tested whether or not activity-specific genital arousal was different for men and women who reported masochistic interests (Chivers et al., 2014). Men with masochistic interests reported significantly greater subjective and genital arousal to masochistic sex than neutral stimuli but did not differ in their subjective ratings of conventional and masochistic sex narratives. Women with masochistic interests showed the greatest subjective arousal to conventional and masochistic sex (with no significant differences between them). Both men and women with masochistic interests showed more subjective and genital arousal to masochistic sex than any participants with conventional interests. Overall, participants with sexual interests in masochism, regardless of gender, showed nonspecific arousal patterns, responding similarly to both conventional and masochistic sex, once again supporting the notion that BDSM interests

are not used as a complete replacement of conventional sexual behaviors

Individuals can also broaden their interests once already within the BDSM community. Typically, this is done by altering their role identification and/or adopting new or more extreme behaviors. Klement, Sagarin, and Lee (2017a) reported on data from a BDSM event centered on the extremes of sadomasochism (where participants insert needles, hooks, or hang heavy weights from the skin). It was found that engaging in these behaviors increased sexual arousal and decreased both negative affect and stress levels.

Role identification

One study of BDSM participants asked about BDSM identity and fluidity and found BDSM role identification showed a significant relationship to gender and sexual identities (Martinez, 2018). As expected, women were more likely to be in the submissive category, and men were more likely to be in the dominant category. This gender/BDSM identification divide was also found in other studies (Botta et al., 2019; Yost & Hunter, 2012). Genderqueer participants were more likely than men or women to identify as switches, and switches were significantly less likely to be heterosexual than dominants (Martinez, 2018). Queer and pansexual participants had the highest rate of equally sharing role frequencies, followed by lesbians/gays, bisexuals/heteroflexibles, and heterosexuals. Genderqueer individuals had higher role fluidity than women, and women had higher fluidity than men. Results support findings that suggest that, for a sub-set of BDSM participants, BDSM role can liberate individuals from, not reinforce, gender roles (Lammers & Imhoff, 2016).

BDSM behaviors

Exemplifying the broad spectrum of sexual behaviors that may be adopted by BDSM practitioners was a study by Rehor (2015) looking at the behaviors of women who identified with the kink community. More than 50% reported they had participated in sadomasochistic activities like breast play, paddling, flogging, pinching, whipping, and caning. Over half indicated that they had engaged in verbal or physical humiliation, exhibitionism, sensory deprivation, physical punishment, breath play, obedience training, domestic service/submission activities or forced activities for their own sexual gratification. Over 87% engaged in at least 1 of 10 role play scenarios- in order from most to least common: master/slave, fear play (e.g., kidnapping), occupation (e.g., boss), animal play, medical play, age regression, religion, incest, age progression, and necrophilia. About 75% indicated arousal by an object in at least one of five fetish categories (clothing, body parts, fabrics, uniforms, body fluids). Other research (Connolly, 2006) found the most preferred BDSM activities were whipping, caning, and flogging, followed by bondage and spanking. Botta et al. (2019) reported that 58.9% of male and 54.4% of female BDSM practitioners listed bondage as one of their most favorite BDSM activities, 73.8% of males and 90.4% of women favored physical pain, and 56.7% of men and 59.2% of women enjoyed humiliation (cf. Pascoal et al., 2015).

Regarding the extremity of behaviors, 14.4% categorized themselves as being light players, 39% as medium players, 30.5% as heavy, and 15.3% as edge (the most extreme) players (Connolly, 2006). Regardless of the intensity, 90.5% stated they used safe words. Most participants still had non-BDSM sex, with only 11.2% indicating that BDSM was their only form of sexual activity. About 13% had also reported occasionally paying for BDSM services from professional dominants or submissives. The majority (88.4%) of all participants reported engaging in sexual activity without elements of BDSM before they had their first experience with BDSM (Nordling, Sandnabba, Santtila, & Alison, 2006)

With respect to the structure of these diverse behaviors, Alison, Santtila, Sandnabba, and Nordling (2001), similar to other studies, reported 27% of BDSM practitioners identified as sadistic/dominant, 22.7% as switches, and 50.2% as masochistic/submissive. Analysis revealed four domains of behavior: hypermasculinity, administration of pain, humiliation, and physical restriction. Women engaged in significantly more humiliation (e.g., use of gags) than men, whereas men engaged in more hypermasculine behaviors than women. Gay men preferred hypermasculine behaviors (e.g., rimming, penis binding, fisting) and straight men preferred humiliation (see also Nordling et al., 2006). It is possible that these behaviors take on different meanings based on an emphasis on humiliation or hypermasculinity (Alison et al., 2001). Thus, BDSM play can be viewed as a set of behaviors that take on different meanings to individuals based on partner and context. In all four domains, a significant underlying, nonrandom, structure emerged, suggesting that the 29 behaviors investigated were clustered in a predictable way (Santtila, Sandnabba, Alison, & Nordling, 2002). Participants tended to engage in behaviors with increasing intensity, with less extreme behaviors typically preceding more intense behaviors, indicating that, over time, BDSM practitioners adopt more intense behaviors.

Further analysis focused specifically on the 162 males in the above three studies (Sandnabba, Santtila, & Nordling, 1999). The median age of first awareness of BDSM interest was 18–20, and the median age of first BDSM experience was 21–25, again with gay men being older than heterosexual men for both of these. Gay men became aware of their BDSM interests and had their first BDSM experience at an older age than the exclusively heterosexual men (Nordling et al., 2006). When asked about the intensity of their BDSM scenes, a significant number of participants indicated that they had lighter sessions than they wanted (Sandnabba et al., 1999). Moreover, participants believed they preferred heavier sessions than their partners wanted, regardless of BDSM role identity.

When asked about the place of BDSM behaviors, one study found that 85.5% reported doing so at home (Holvoet et al., 2017) and another found that 83.8% reported practicing BDSM at home, while only 4.4% of BDSM activities were reported to take place in BDSM clubs (Pascoal et al., 2015). This points to a potential sampling bias, as many studies on BDSM recruit from BDSM clubs and events, though the behaviors of those who practice in and out of the home appear similar.

Collectively, results from each of these studies indicate that BDSM identification and behaviors can change over time,

though the fluidity of these differ between individuals. They also show that, for a majority, BDSM behaviors are in addition to, not a replacement of, more typical sexual behaviors (Alison et al., 2001; Chivers et al., 2014; Rehor, 2015; Sandnabba et al., 1999; Sandnabba et al., 2002). This supports non-pathological models of atypical sexual interests that focus on the broadening of sexuality (Cross & Matheson, 2006).

Psychological correlates

Mental health and clinical considerations

In general, BDSM practitioners are comparable to the general population in terms of mental health (Connolly, 2006; Cross & Matheson, 2006; Richters et al., 2008, 2003). For example, it was found that BDSM practitioners reported lower depression scores, but typical levels of anxiety, compared to population norms (Connolly, 2006). However, some studies have found sub-groups of BDSM practitioners report more psychological problems. On measures of dissociation, submissiveness was related to reported memory disturbance and depersonalization, regardless of gender (Connolly, 2006). Another study found that men and women who engaged in these behaviors were more likely to show posttraumatic symptoms than those who did not engage in these behaviors, and both men and women who reported engaging in at least one atypical sexual behavior were significantly more likely to be a victim of sexual violence (Oliveira Júnior & Abdo, 2010). However, participants did not differ from population norms on depression, anxiety, panic, or phobias.

Other studies indicated that BDSM participants with a history of sexual abuse may be at risk of mental health issues (Nordling et al., 2000). For instance, Nordling et al. (2000) found that BDSM practitioners with a history of CSA were more likely to have ever attempted suicide, had more hospital psychological treatment, and were more likely to visit a physician regarding BDSM related injuries. Brown et al. (2017) investigated the potential risk of suicide attempts, based on the interpersonal theory of suicide, in which an acquired capability for suicide develops via habituation to exposure to painful or traumatic events (Van Orden et al., 2010). As participating in or watching a BDSM scene could be considered painful and/or emotionally provocative, participants may habituate over time, and thus increase their risk of suicide. For males, (no association was found for females) more engagement in BDSM was associated with an increased chance of a suicide attempt, but only when this relationship was mediated by both fearlessness about death and perceived pain tolerance. Twelve percent reported at least one suicide attempt; a rate higher than the general population. Roush, Brown, Mitchell, and Cukrowicz (2017) reported 37.4% (higher than the estimated 3.7% of US adults) of the BDSM practitioners reported some level of suicide ideation in the past two weeks. However, feelings of thwarted belongingness and perceived burdensomeness mediated the relationship between shame and suicidal ideation in this sample, suggesting that the stigmatization of BDSM (not BDSM itself) may be a causal factor for depressive symptoms.

Although some of this research points to mental health issues, it does not indicate that most practitioners suffer from

clinically significant psychological problems. A sub-section of BDSM practitioners, perhaps those who suffered non-BDSM related trauma, may be at an increased risk of psychological distress. Studies that point to mental health problems have used small sample sizes (Nordling et al., 2000) or included other sexual interests, like pedophilia (Oliveira Júnior & Abdo, 2010) in their results. There is greater need to separate comorbid problems and diagnostic versus symptom-based definitions of poor psychological health.

Personality

Hébert and Weaver (2014) found that BDSM practitioners did not differ from population norms on honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, desire for control, self-esteem, life satisfaction, and empathy. However, dominants and submissives scored lower on altruism. When compared to other BDSM orientations, submissives scored higher on openness to experience and emotionality, and dominants scored higher on desire for control and extraversion. Compared to controls, results from another study found that BDSM participants scored higher on openness to experience, extraversion, and conscientiousness, and lower on rejection sensitivity, neuroticism, agreeableness (Wismeijer & Van Assen, 2013). When comparing across orientations, switches and dominants scored higher on openness than submissives and submissives scored higher on agreeableness than dominants. Additionally, a 2019 study found that neither extraversion or neuroticism were predictors of dominant or submissive role identification (Hillier, 2019).

Dawson et al. (2016) found that hypersexuality, sexual compulsivity, impulsivity, and sensation seeking were positively related to paraphilic interest scores. Generally, measures associated with excessive or compulsive sexual behavior, along with sociosexuality, were correlated with paraphilic interests. As previously mentioned, Shulman and Home (2006) found that erotophilia predicted fantasies involving submissiveness and force and was negatively related to sex guilt. Rye, Serafini, and Bramberger (2015) reported that erotophilia was positively related to personal feelings about BDSM and comfort in discussing BDSM.

Some research has studied Dark Triad traits (psychopathy, narcissism, and Machiavellianism) and personality disorder characteristics in relation to BDSM. One such study using the WSFQ reported that while psychopathy was significantly related to all four fantasy domains (intimate, exploratory, impersonal, and sadomasochism), it was most strongly correlated with impersonal fantasies (Baughman, Jonason, Veselka, & Vernon, 2014). Sadomasochism appeared most strongly and significantly related to psychopathy, followed by narcissism, and Machiavellianism (which was not significant; see also Williams et al., 2009). One study of adults with sub-clinical paraphilic interests found that, out of the Big 5 and the Dark Triad, only openness predicted sadomasochism in men, and openness, low conscientiousness, and Machiavellianism predicted sadomasochism in women (Lodi-Smith et al., 2014). Connolly (2006) found dominants scored higher on measures of narcissism and histrionic symptoms than the normative values, but this effect was greater in men. BDSM participants did not score significantly above non-clinical population norms for histrionic, avoidant, or

dependent personality disorder symptoms, though submissives did have significantly higher dependence scores than dominants (see also Watts, Nagel, Latzman, & Lilienfeld, 2019).

Interpersonal relationship factors

Due to social stigma, BDSM participants may be hesitant to disclose their interests in personal and clinical settings. On disclosure, 34.1% reported feeling they could tell most of the adults in their lives about their BDSM interests, 52.4% said they could tell some people in their lives, 9.5% said they did not feel comfortable disclosing to anyone, and 4% reported they had to permanently hide their interests (Connolly, 2006). The majority (53.7%) felt uncomfortable by the prospect of their BDSM interests being discovered by others; 1.6% of these individuals said it terrified them. Another study found that fewer than 5% had disclosed to a family member, 25.6% to a friend, and 3.8% to a colleague (Holvoet et al., 2017).

Research on attitudes toward BDSM found that as participants reported more prejudice toward sadomasochists, they also reported more homophobia and social and sexual conservatism (Yost, 2010). Endorsement of false statements about rape was also related to the belief that BDSM practitioners were violent and dangerous. However, as knowledge about BDSM, involvement in BDSM, or knowing individuals involved in BDSM increased, prejudice decreased. Pre-existing beliefs about BDSM was also found to shape attitudes toward BDSM more than media portrayal (Rye et al., 2015).

These mixed social attitudes toward BDSM can lead to lack of disclosure in clinical contexts, with many BDSM practitioners being worried about disclosure during therapy (Kelsey, Stiles, Spiller, & Diekhoff, 2013; Roush et al., 2017). A study of licensed mental health professionals found that 76% reported having at least one client that engaged in BDSM (Kelsey et al., 2013). Sixty-seven percent agreed that it could be part of a healthy relationship, and 70% disagreed that it should be treated through therapy. Therapists who had more experience with BDSM clients had significantly more positive attitudes about BDSM. However, over half (52%) did not consider themselves competent enough to see BDSM clients, and 64% reported having no graduate training mentioning BDSM. Research on psychotherapist perceptions suggest that there may be more bias against male clients who disclose dominant or sadistic sexual interests, seeing them as more dangerous (Fuss, Briken, & Klein, 2018). Those trained in psychoanalysis also pathologized sadistic behaviors more than those trained in cognitive behavioral therapy, fitting with the etiological theories supported by psychoanalytic thought.

Contrary to some stereotypes, research suggests that BDSM can be beneficial to both social and romantic relationships. Drawing primarily from a sample of BDSM practitioners who attended related events, almost 90% said they held a membership at one or more BDSM organizations, 73% indicated they attended events regularly, 70.9% indicated this involvement provided them with an avenue for social support, 85% said it helped them make friends, and 83.4% said it gave them educational opportunities (Connolly, 2006). For BDSM practitioners in committed relationships, dyadic

adjustment scale scores on consensus, satisfaction, and cohesion subscales did not differ between BDSM orientations (Rogak & Connor, 2017).

Another study found that there were no significant differences in relationship communication anxiety between those who did and did not participate in spanking, bondage, submissive behaviors, and BDSM in general (Kimberly, Williams, & Creel, 2018). Engagement in BDSM was related to a significant increase in sexual communication comfort, though it did not relate directly to an increase in relationship satisfaction. Other studies using biomarkers such as cortisol levels also reported that BDSM engagement may be associated with greater couple bonding (Sagarin, Cutler, Cutler, Lawler-Sagarin, & Matuszewich, 2009). High relationship satisfaction was also found in what some consider to be the most intense BDSM relationship- the "Master/slave" relationship. For example, 88% of participants in Master/slave relationships stated that they were satisfied or completely satisfied with their relationship (Dancer, Kleinplatz, & Moser, 2006). Overall, empirical research has demonstrated that BDSM relationship functionality and satisfaction is not significantly different from the general population (Kimberly et al., 2018; Rogak & Connor, 2017).

Discussion

There is a disparate literature on various aspects of BDSM, including potential origins, psychological and relationship correlates. However, this literature is often placed under the umbrella of "paraphilias", and there are no reviews which offer a coherent overview of these segments of the BDSM literature. The purpose of this review was to address this gap. Despite the difficulties in generalizing across studies which differ in methodological approach, population characteristics, and analyses, we are able to make some broad conclusions and directions for future inquiry. There appears to be little support for psychoanalytic or psychopathological theories of BDSM development (e.g., Cross & Matheson, 2006; Connolly, 2006; Richters et al., 2014). Feminist models, which imply that BDSM power dynamics are related to sexism, are also not supported (e.g., Klement et al., 2017b; Shulman & Home, 2006). There was no strong evidence for models that suggest that BDSM participants have increased risk of CSA or maladaptive attachment styles (Richters et al., 2008; Santtila et al., 2001), although CSA may play a role in a sub-set of individuals (Nordling et al., 2000). Empirical evidence was shown for theories that regard BDSM as a form of leisure (Williams et al., 2016), a facet of sex drive (Lammers & Imhoff, 2016), or as a broadening of sexual repertoire (e.g., Cross & Matheson, 2006; Tomassilli et al., 2009). The primary etiological finding of this review challenges the historical psychopathological model of BDSM interests, suggesting that future research should instead focus on looking into new, more complex etiological pathways for the development of specific sexual interests.

Studies on prevalence of BDSM interests differ, with reports ranging from 2% (Richters et al., 2003) to close to 70% (Holvoet et al., 2017). This range is most likely due to differing definitions, classifications, and sampling biases (e.g.,

from self-selected samples), although most research agrees that BDSM interests are not statistically rare (defined here as less than a 2.3% prevalence rate; Joyal et al., 2015; Zurbriggen & Yost, 2004). While interests and fantasy rates are quite high, engagement in BDSM is lower, usually around 20%–30% (Bailey et al., 2003; Joyal & Carpentier, 2017; Tomassilli et al., 2009). Thus, it is important to note that having these sexual fantasies do not mean that individuals necessarily enact them. This distinction is sometimes obscured in the literature we reviewed.

Individuals who participate in, and identify with, BDSM tend to be white, well educated, young, and are more likely than the population to be non-heterosexual, though most studies presented here do not draw from representative samples (Hébert & Weaver, 2014; Richters et al., 2014; Tomassilli et al., 2009). They also tend to have higher rates of non-monogamous relationships and report more sexual partners and experience (Oliveira Júnior & Abdo, 2010; Richters et al., 2008). Men are more likely to identify as dominants, tops, or sadists, while women are more likely to identify as submissives, bottoms, or masochists, but this pattern is not as strong in non-binary or non-heterosexual practitioners (Martinez, 2018; Zurbriggen & Yost, 2004). Importantly, BDSM does not appear to replace normophilic behaviors (Cross & Matheson, 2006; Hounbedji & Guillem, 2016; Williams et al., 2009). Findings here imply that there is a need to reframe the current scientific view of what is considered “atypical” in sexuality with more comprehensive research on prevalence rates of sexual fantasies and behavior both in the population and BDSM communities. Additionally, results from this review indicate a need to investigate the complex relationships between sexual orientation, relationship style preferences, gender, and sexual interests.

While there is some evidence (e.g., Baughman et al., 2014) for BDSM practitioners showing higher levels of narcissism and psychopathy, these levels did not warrant a clinical diagnosis (Mahmut, Homewood, & Stevenson, 2008). A small sub-set of BDSM practitioners may be at a higher risk of suicide (e.g., Brown et al., 2017). In contrast to pathology-focused models, BDSM practitioners are less sexist (Connolly, 2006; Klement et al., 2017b; Shulman & Home, 2006), more open to new experiences (e.g., Hébert & Weaver, 2014; Lodi-Smith et al., 2014), more extraverted (Wismeijer & Van Assen, 2013), and better at relationship communication (Kimberly et al., 2018; Rogak & Connor, 2017). Though there is little evidence for a link between psychopathology and BDSM, this review has identified potential sub-groups of BDSM practitioners who may be at a higher risk for developing mental health issues. Research should focus on identifying characteristics of these subgroups, as it may provide clinically important information about BDSM-identified individuals who experience psychological distress.

One of the larger findings of this review was that BDSM may be an expansion of unusual sexual fantasies and behavior (e.g., Cross & Matheson, 2006; Hounbedji & Guillem, 2016). This suggests that further work should focus on better understanding the psychometric structure underlying this trait. For example, BDSM interests and behavior may be part of a latent factor of paraphilic interests, form a factor on its own, or be

part of a hierarchical structure linked by a third factor such as general atypical sexual interests or sex drive. Future research should also focus on a broader range of measures of mental health, the investigation of biological factors, the relationship between BDSM and sexual orientation, and discrimination of BDSM-identified people.

Limitations of this scoping review include restriction of the literature to peer-reviewed articles published between 2000 and 2019, and omitting articles which used only qualitative approaches. Including qualitative studies may have helped provide new observations based on BDSM practitioner experiences in some of the topics (e.g., relationships). We also restricted sample sizes in studies to 12 or more. The sample of literature also focused on that which was published in Western and English-language journals and so does not fully reflect the research priorities or cultural contexts of other locations. Understanding the basic prevalence, developmental factors, psychological, and relationship correlates of BDSM is a prerequisite for informing future research directions.

In sum, our results highlight the field’s interest in prevalence of BDSM interests and behaviors, psychological factors implicated in the development of BDSM (e.g., personality traits), the influence on relationship processes, and particularly the focus on BDSM as a broadening of sexual interests and behavior. Results also highlight important definitional limitations in the extant literature, and lack of attention to sampling and selection biases in studies. There is a notable lack of work on the development and use of psychometrically validated measures of BDSM and on biological correlates which are implicated in the development of atypical sexual interests (Seto, 2017).

ORCID

Ashley Brown  <http://orcid.org/0000-0001-6743-3773>

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