



# Exploring Variations in Individuals' Relationships to Sexual Fantasies: A Latent Class Analysis

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## Abstract

Sexual fantasies represent a vast and highly personal dimension of human sexuality that remains understudied empirically. This article used a person-oriented approach to examine the reactions of arousal and discomfort that individuals experienced in response to four proposed fantasy scenarios depicting themes of romance, power dynamics (i.e., submission and domination), pain (i.e., sadism and masochism), and sexual violence. Using an online sample of 566 adult participants (250 men and 291 women) from the general population of Canada and the U.S., four classes were identified based on reactions of arousal and discomfort toward the proposed scenarios: Indifferent (relatively low arousal and discomfort to all scenarios, 37%), Romantic (high arousal solely for the romance scenario, high discomfort toward other scenarios, 22%), Enthusiastic (high arousal and low discomfort in response to all scenarios, 26%), and Dissonant (relatively high arousal and discomfort toward all scenarios, 15%). These classes were then compared to examine differences in terms of the following psychosexual characteristics: gender, experiences of childhood sexual abuse, sexual compulsion, and romantic attachment. Findings illustrated distinct patterns of reactions toward fantasies and confirmed the presence of links between reactions toward sexual fantasies, psychosexual characteristics, and traumatic life experiences. This suggests that the relationship between individuals and their sexual fantasies may be indicative of their overall relationship with sexuality.

**Keywords** Sexual fantasy · Sexual compulsion · Childhood sexual abuse · Attachment · Latent class analysis

## Introduction

Over the past decade, the topic of sexual fantasies has been ever-present in the public eye. This popularity can be attributed, in part, to the Internet and the proliferation of erotic novels, such as *Fifty Shades of Grey* (James, 2011). This popular unveiling of sexual fantasies has in turn contributed to a progressive normalization of what was previously seen as deviant or unhealthy (Joyal et al., 2015). Sexual fantasy has been defined as a mental image or pattern of thought that stirs a person's sexuality and ignites or enhances sexual arousal (Leitenberg & Henning, 1995). Sexual fantasy is considered a very personal aspect of human sexuality, and a key factor

in activating and maintaining sexual desire and arousal in individuals (Stockwell & Moran, 2014). Despite its important role in sexuality, sexual fantasy is a topic that has been somewhat understudied in research. Beyond examining physiological arousal (Harris et al., 2012; Lalumière et al., 2017), little has been done concerning the subjective reactions that sexual fantasies can provoke in individuals. While it has been established that sexual fantasies are related to sexual arousal (excitatory reaction), inhibitory or negative reactions provoked by sexual fantasies have yet to be examined. The dual control model of sexual response offers an interesting framework to this examination as it stipulates that sexual responses depend on a balance between excitatory (e.g., arousal) and inhibitory (e.g., discomfort) processes (Janssen & Bancroft, 2007). Previous studies have highlighted that individuals may experience complex patterns of positive and negative effects in response to sexual stimuli (Peterson & Janssen, 2007). Yet, empirical data are lacking on excitatory and inhibitory reactions to sexual fantasies, such as discomfort and arousal, as individuals may experience both in response to sexual fantasies. Examining these patterns of reactions represents

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an important step toward a comprehension of individual relationships to sexual fantasies.

The majority of studies on this topic have focused on the content of sexual fantasies (Joyal et al., 2015; Lehmiller, 2018). From these studies, a consensus emerged that most fantasies previously labeled as “deviant,” either for their assumed statistical rarity or because they presented themes seen as problematic (e.g., sadism, violence; see Leitenberg & Henning, 1995 for a review), were actually frequent in the general population. Only two fantasies were found to be statistically rare (2.3% or less of participants): pedophilia and bestiality (Joyal et al., 2015). Furthermore, both studies established similar common categories of fantasies, including romantic fantasies, power dynamic fantasies, pain-related fantasies, and sexual violence fantasies.

First, romantic fantasies that are centered on a romantic partner and include feelings or contexts of tenderness, love, and intimacy were highly reported (99% in Lehmiller, 2018; 88% men, and 92% women in Joyal et al., 2015). Second and third, power dynamics fantasies and fantasies related to physical pain were often grouped together (reported by 93% of men and 96% of women, Lehmiller, 2018). Even though these categories can overlap in some individuals, they are distinct as the arousal in power dynamic fantasies is derived from the idea of losing (i.e., submission) or having (i.e., domination) psychological and/or physical control (40–65% of individuals, Joyal et al., 2015), while in pain-related fantasies the focus is the pleasure derived from the sensations associated with inflicting (i.e., sadism) or receiving physical pain (i.e., masochism; 23–48% of individuals, Joyal et al., 2015). Finally, even though they are not as prevalently reported, it is important to mention the presence of sexual violence fantasies, also known as “rape fantasies” (72% of women and 87% of men; Lehmiller, 2018). More individuals report fantasies where they identify as the victim (30–31%) than as the perpetrator (11–22%; Joyal et al., 2015). The key themes of sexual violence fantasies center around the lack of consent when participating in sexual acts, which is why these types of fantasies differ from power dynamic fantasies where the focus centers around consensual sexual acts between partners (Kahr, 2008).

While previous studies offer a comprehensive portrait of fantasy themes in the general population, their measures (i.e., self-reported fantasies in Lehmiller, 2018, and frequency questionnaire of different fantasies in Joyal et al., 2015) did not account for the reactions participants experienced in response to sexual fantasies. Indeed, only a few studies examined participants’ reactions toward sexual fantasies using short audio scenarios, focusing mainly on comparing arousal responses toward violent and nonviolent scenarios in male sexual offenders versus non-offenders (Harris et al., 2012; Lalumière et al., 2017). According to phallogometric measures of arousal (i.e., erectile response), offenders displayed more

arousal toward violent scenarios compared to non-offenders who displayed more arousal toward nonviolent scenarios. These results highlight the importance of considering reaction toward sexual fantasies. Using scenarios may be an effective way to capture arousal responses; however, more studies are needed to document specific profiles of individuals based on their patterns of arousal and discomfort reactions across different fantasy scenarios. Indeed, a person-centered approach to analysis (e.g., latent class analysis [LCA]) may offer a more in-depth examination of the groups described in Nylund et al.’s (2007a, 2007b) results.

Aside from studies centered on sexual fantasies, some investigated the links between experiences of childhood sexual abuse (CSA) and sexual fantasies, finding distinct profiles when comparing survivors and non-victims (Briere et al., 1994; Gold, 1991). According to Briere et al., women who had experienced CSA were more likely to report submission fantasies, while men who had experienced CSA were more likely to report fantasies where they would force their partner non-consensually, when compared to non-victims. Another study found that women CSA survivors ( $n = 21$ ) reported more fantasies where involving being forced or put in a submissive role compared to non-victims (Gold, 1991). CSA experiences, typically representing a traumatic first introduction to sexuality for the child (e.g., traumatic sexualization, Finkelhor & Browne, 1985), can alter the victim’s psychosexual development and sexual functioning in adulthood, leading to feelings of shame, disgust, and guilt toward sexuality. Therefore, in addition to exhibiting differences in the content of their fantasies, CSA survivors may experience inhibitory reactions toward sexual fantasies (e.g., discomfort), perhaps especially toward fantasies depicting themes of violence or power. Empirical data are needed to support this hypothesis.

Previous studies also documented significant associations between sexual fantasies (frequency and content) and psychosexual characteristics. For instance, distinct gendered patterns in sexual fantasies were found related to power dynamic fantasies in studies on the general population (Joyal et al., 2015) and on CSA survivors (Briere et al., 1994). Precisely, men reported more dominant fantasies and women reported more submissive fantasies, underlining the importance of considering gender when documenting fantasy patterns in individuals. Furthermore, Dyer et al. (2016) found that sexual compulsivity predicted an increase in the frequency of sexual fantasies. Birnbaum’s (2007, 2010) studies found differences in sexual fantasies according to different romantic attachment styles. Respectively, fear of being abandoned by a romantic partner (i.e., anxious attachment), and the discomforting desire to avoid intimacy (i.e., avoidant attachment), were associated with distinct patterns in sexual fantasies (Birnbaum, 2007). Anxiously attached women reported more themes of unrestricted and emotionless sex, often involving

unknown partners. They also reported more representations of themselves as highly desirable. Anxiously attached men reported more themes of romance fantasies, often focused on satisfying their romantic partners. They also reported more representations of themselves as romantic and affectionate. Finally, avoidant attachment was linked to a lower presence of romantic themes in fantasies, especially among men, and to a higher frequency of representing oneself as helpless or humiliated (Birnbaum, 2007).

To summarize, previous research has documented prominent categories of sexual fantasies. Nevertheless, little attention has been paid to the patterns of arousal and discomfort that different fantasies might provoke in individuals. In order to capture these intricate patterns linking sexual fantasies and other individual factors, a person-centered approach, such as latent class analysis, may be particularly effective (Nylund et al., 2007a, 2007b). This approach may allow for the identification of latent classes based on similar patterns of reactions (i.e., discomfort and arousal) to the proposed fantasy scenarios, instead of assessing reactions toward each type of fantasy separately. In addition to this, consideration of key study-yielded factors may allow for the comparison of different profile factors, including gender, CSA, sexual compulsion, and romantic attachment (Birnbaum, 2007; Briere et al., 1994; Joyal et al., 2015; Nylund et al., 2007a, 2007b).

## Objectives

The present research consisted of an exploratory study, which aimed to take a step toward understanding the relationship individuals entertain with their sexual fantasies. This was done by observing patterns of arousal and discomfort reactions toward proposed fantasy scenarios in a convenience sample extracted from the community through social media platforms. First, this study aimed to identify classes according to the individuals' patterns of arousal and discomfort reactions toward four proposed fantasy scenarios (i.e., romance, submission/masochism, domination/sadism, and sexual violence). Second, this study aimed to examine the differences between classes in terms of psychosexual characteristics, namely gender, CSA experiences, sexual compulsivity, and romantic attachment.

## Method

### Participants and Procedure

A convenience sample was recruited from the general population of Canada and the U.S. To qualify for the study, individuals had to have reached the age of majority in accordance with provincial and state laws regarding the legal age of consent, to currently reside in Canada or the U.S. and to have sufficient

mastery of English in order to answer an online survey. Participants were recruited through posts on social media platforms (e.g., *Facebook*, *Tumblr*), as well as through diverse listservs such as *Psychological Research on the Net*. Posts contained a brief description of the study and its objectives, along with a link to the online survey, hosted on the secure platform *Qualtrics*. No compensation was offered to participants. The present study was approved by the university's Institutional Ethics Review Board.

A total of 566 participants completed the survey, which took around 30–40 min. The majority of participants (60.5%) had heard of the study through social media platforms (e.g., *Facebook*, *Tumblr*), 14% of participants through listservs, and the rest (25.2%) through word of mouth. Table 1 shows the sociodemographic characteristics of participants. Almost half (51.4%) of participants identified as women, 44.2% as men and 4.4% identified as other (e.g., non-binary). However, people who identified their gender as being "other" were excluded from analyses due to the low representation (less than five individuals per class). The majority were born in the U.S. (52%) or Canada (36%). Participants' mean age was 26 years old ( $SD = 8.64$ , ranged from 18 to 95). In terms of sexual orientation, 43% of participants identified as heterosexual, 22% as homosexual, 22% as bisexual, 5% as queer and 7% identified as other (e.g., pansexual). As for their relationship status, 51% of participants reported being currently in a relationship (i.e., stable partner, cohabiting, or married), while 47% reported being single, and 2% reported other (e.g., widowed). In terms of occupation, half (50%) of the participants were students and 39% were in the workforce. Finally, the majority of the sample (55%) reported an annual personal income of \$19,999 or less.

## Measures

### Indicator Variables: Sexual Fantasy

Measures of sexual fantasy were developed for this study, based on techniques used in previous research on this topic (Harris et al., 2012; Lalumière et al., 2017). Four written scenarios (about a paragraph in length) were created to depict four types of sexual fantasies: (1) romance, (2) submission/masochism, (3) domination/sadism, and (4) sexual violence (i.e., rape fantasy). The romance scenario reflected aspects of intimacy, comfort, closeness, and tenderness. The submission/masochism scenario depicted sexual pleasure derived from the loss of control, obeying a partner, and receiving physical pain. On the other hand, the domination/sadism scenario depicted sexual pleasure derived from having control over, giving orders, and inflicting pain to the partner. Finally, the sexual violence scenario contained dimensions of lack of consent, coercion as well as physical and psychological violence. Each scenario depicted two characters and were

**Table 1** Sample characteristics ( $n = 566$ )

Sociodemographic	
Age $M(SD)$	26 (8.64)
Gender	
Male	44.2%
Female	51.4%
Other	4.4%
Country of origin	
Canada	35.5%
USA	51.8%
Other	12.7%
Sexual orientation	
Homosexual	22.3%
Heterosexual	44.0%
Bisexual	21.6%
Queer	5.5%
Other	6.7%
Relationship status	
Single	28.1%
Single, w. occasional partner	18.9%
With stable romantic partner	29.3%
Cohabiting	12.7%
Married	8.8%
Other	2.1%
Highest education level	
High school	25.8%
College/Cegep	22.4%
University, bachelor (BA.)	38.2%
University, graduate (MA./PhD)	12.9%
Occupation	
Student	49.8%
Worker	38.7%
Unemployed	4.4%
At home full-time	2.7%
Retired	0.7%
Other	3.7%
Annual personal income	
$\leq 19,999$ \$	55.6%
20,000–39,999 \$	24.0%
40,000–59,999 \$	13.2%
$\geq 60,000$ \$	7.2%

written using gender neutral language to allow inclusion of diverse sexual orientations. Two questions were asked right after each scenario: one assessing the level of subjective sexual arousal that participants experienced while reading (“Please rate the level of sexual arousal you experienced while reading this scenario”), and the other, the level of subjective discomfort (“Please rate the level of discomfort you experienced while reading this scenario”). Response options were based on an 11-point Likert scale ranging from zero

(no arousal/discomfort) to ten (intense arousal/discomfort). All participants were invited to read the different scenarios, which were separated in the survey by other scales (one scale, one scenario, and so forth) to avoid tainting the reactions to the scenarios. Each participant was invited to answer the entirety of the questionnaire, including the four scenarios. These scenarios were developed based on material found on erotica websites (e.g., *Lushstories*) labeled with the chosen themes (e.g., stories labeled submission) and on the transcripts of the scenarios used in Lalumière et al.’s (2017) study. The scenarios were then validated using a committee of five experts comprised of two Ph.D. students in sexology and three sex and relationship researchers. Upon reading, each expert was asked to evaluate whether they thought the scenarios accurately reflected the targeted themes on a scale ranging from zero (*not at all*) to ten (*totally*). Revisions were made according to the experts’ comments until each expert’s score reached a minimum of nine.

### External Variables: Psychosexual Characteristics and Life Experiences

**Childhood Sexual Abuse** CSA was assessed based on the Code criminel canadien (1985), asking participants if they endured an unwanted sexual experience or any sexual contact with an adult, a person in a position of authority or someone five years older, before the age of 18 (Vaillancourt-Morel et al., 2015). CSA was a dichotomous variable and was scored as zero (*absent*) or one (*present*) if they answered “yes” to any of the options above. This measure of CSA was used to limit the response biases (i.e., including participants who endured CSA but do not identify as “victims”; Vaillancourt-Morel et al., 2016) and to capture if participants had experienced a sexual contact while they could not consent legally (e.g., parents, extended family members, a person in position of authority) as well as any experiences of unwanted sexual acts (e.g., with a peer).

**Sexual Compulsivity** The ten-item version of the Sexual Compulsivity Scale (Kalichman & Rompa, 1994) was used to measure sexual compulsion. This scale assesses sexual compulsivity in terms of hypersexuality and sexual preoccupations. The items were rated on a four-point Likert scale ranging from one (*not like me at all*) to four (*totally like me*). Examples are “My desires to have sex have disrupted my daily life” and “My sexual thoughts and behaviors are causing problems in my life.” Items were summed to compute a total score ranging from 10 to 40, where a higher score represented a higher level of sexual compulsivity. While there is currently no validated clinical cutoff for this scale, previous research has used a score of 24 or above as an indication of severe sexual compulsivity symptoms (McBride et al., 2008). This scale demonstrated excellent internal consistency, with

alphas ranging from 0.87 to 0.92 in previous studies (Kalichman & Rompa, 1994) and reaching 0.89 in the current sample.

**Romantic Attachment** The 12-item version of the Experiences in Close Relationships (ECR-12) questionnaire (Lafontaine et al., 2016) was used to measure romantic attachment. The ECR-12 includes two six-item subscales that assess the two dimensions of romantic attachment; abandonment anxiety (e.g., “I worry about being abandoned”) and avoidance of intimacy (e.g., “I don’t feel comfortable opening up to a romantic partner”). Items are scored on a seven-point Likert scale with response options ranging from one (*strongly disagree*) to seven (*strongly agree*). Items on each subscale are averaged, higher scores indicate greater attachment anxiety or avoidance. A mean of 3.5 or above on the anxiety subscale indicates an anxious attachment and a mean of 2.5 or above on the avoidance subscale indicates an avoidant attachment (Brassard et al., 2012). Attachment styles can be inferred using these scores, in accordance with attachment theory: a non-anxious and non-avoidant participant is considered secure, a non-anxious but avoidant participant is considered detached, an anxious but non-avoidant participant is considered preoccupied, and an anxious and avoidant participant is considered fearful (Brassard et al., 2012). Good internal consistency for this scale was found in previous studies, with alphas ranging from 0.78 to 0.87 for the anxiety subscale and from 0.74 to 0.83 for the avoidance subscale (Lafontaine et al., 2016). In the current study, Cronbach’s alphas were satisfactory with 0.88 for the anxiety subscale and 0.86 for the avoidant subscale.

## Statistical Analyses

Analyses consisted of three steps. First, descriptive analyses conducted on SPSS 25.0 were used to describe reactions (i.e., arousal and discomfort) toward the scenarios, romantic attachment, sexual compulsion, and CSA in the sample as well as the association between all studied variables. Second, we used Mplus v8.1 (Muthén & Muthén, 2012) to conduct LCA based on participants’ scores with the eight items, precisely arousal and discomfort associated to each of the four scenarios. In order to normalize distributions for analysis, the zero to ten scores on the respective discomfort and arousal items were transformed (i.e., score of zero = zero, scores of one to three = one, scores of four to seven = two and scores of eight and above = three), to obtain four levels of arousal and discomfort: zero (*none*), one (*low*), two (*moderate*), and three (*high*). Missing data were handled using Full-Information Maximum Likelihood (FIML) implemented in Mplus. To select the optimal number of latent classes, we relied on Akaike’s Information Criterion (AIC; Akaike, 1987), the Bayesian Information Criterion (BIC; Schwartz, 1978), and

theoretical interpretability. AIC and BIC scores were lower while the number of classes increased until a certain point (optimal number of classes). The lowest AIC and BIC scores indicate the optimal number of classes (Nylund et al., 2007a, 2007b). Simulations studies found that the AIC tends to overestimate the correct number of classes, while the BIC, which balances model fit and parsimony, has been described as the best of these indicators (McLachlan & Chang, 2004; Nylund et al., 2007a, 2007b). For this reason, the BIC was prioritized along with theoretical interpretability.

Third, chi-square tests and ANOVAs with Bonferroni-corrected post hoc analyses were conducted on SPSS 25.0 to compare classes on external variables (i.e., variables not used to generate the classes in this case sociodemographic: CSA, compulsion and attachment). Values of Cramer’s  $V$  ( $\phi'$ ) and eta squared ( $\eta^2$ ) were used as measures of effect size. Cutoffs for small, medium, and large effect sizes for  $\phi'$  were determined based on the smallest number of categories ( $r$ ) in the contingency table (i.e., when  $r = 2$ , 0.10 = small, 0.30 = medium, and 0.50 = large; when  $r = 3$ , 0.07 = small, 0.21 = medium, and 0.35 = large; Cohen, 1988). Benchmarks for  $f$  values suggested by Richardson (2011) were used to define small, medium, and large effects for  $\eta^2$  (i.e., 0.0099, 0.0588, and 0.1379).

## Results

Descriptive analyses among participants indicated that most of the sample reported elevated (moderate/high) levels of arousal (58%) and low (none/low) levels of discomfort (89%) in response to the romance scenario. Regarding the submission/masochism scenario, 54% of participants reported elevated levels of arousal and 77% reported low levels of discomfort. As for the domination/sadism scenario, 40% displayed elevated levels of arousal, and 66% low levels of discomfort. Finally, regarding the sexual violence scenario, 22% of participants reported elevated levels of arousal (the majority, 65%, reported none) and 25% displayed low levels of discomfort. Looking at external variables, 13% of participants reported a history of CSA (12% of men and 14% of women). Mean score on the Sexual Compulsivity Scale for the sample was 15.57 (SD = 5.78). Finally, 58% of the present sample scored above the cutoff for avoidant attachment and 68% scored above the cutoff for anxious attachment, leading to a majority of 82% participants displaying insecure attachment styles (i.e., 14% detached, 24% preoccupied, and 44% fearful) and 16% reporting a secure attachment style.

## Latent Class Analysis Model Selection

The first analytic step was to compare models ranging from two to six latent classes based on the eight items assessing

sexual arousal and discomfort. The lowest AIC score indicated that a six-class model was optimal, and the lowest BIC score indicated that a four-class model as optimal (see Table 2). Upon comparison of the six- and four-class models, the four-class model was identified as the optimal model to represent the data. This decision was based on the BIC, which is reported as the better indicator of model fit (Nylund et al., 2007a, 2007b), and on theoretical interpretability. In terms of theoretical interpretability, the four-class model was chosen over the six-class model as the two extra classes in the later model regrouped less than 20 participants each, making comparison with other classes difficult.

The examination of arousal and discomfort responses (see Figs. 1, 2, 3, and 4) allowed for the interpretation of classes. The first and largest class ( $n = 211$ ) is labeled *Indifferent* because it groups individuals who reported lower levels of both arousal and discomfort toward all scenarios. In fact, 22% reported high discomfort toward the sexual violence scenario, as compared to 30–85% in other classes, while only 0–5% of individuals in this class reported elevated levels of discomfort or arousal for the other scenarios, which is lower

similar to their level of arousal. For instance, in response to the dominance/sadism scenario, 70% of Dissonant individuals reported high or moderate arousal, while they also reported high or moderate discomfort at a similar rate (65%).

### Classes and Sociodemographics

Group comparison analyses were conducted to compare the four observed classes according to sociodemographic characteristics (see Table 3) to examine whether these factors were related to class membership. The results of chi-squared analyses for gender indicated a significant small difference between classes,  $\chi^2(3, n = 566) = 7.86, p = 0.048, \phi' = 0.12$ . As shown in Table 3, significant gender differences indicated that the Romantic and Dissonant classes contained significantly higher proportions of women (61% each) than the Indifferent (47%) and Enthusiastic (53%) classes. Group comparison analyses yielded no significant differences in terms of sexual orientation across the four classes ( $p = 0.096$ , see Table 3).

### Psychosexual Characteristics and Child Sexual Abuse Among Classes

The results of chi-squared analyses (see Table 3) revealed a small statistically significant difference between classes in terms of CSA experiences,  $\chi^2(3, N = 566) = 8.05, p = 0.045, \phi' = 0.13$ . Participants in the Enthusiastic class had a significantly higher proportion of CSA survivors (23%) than the other classes (respectively, 12% in Romantic and Indifferent and 20% in Dissonant). ANOVAs found a medium significant difference between groups in regards to sexual compulsivity,  $F(3, 427) = 7.94, p < 0.001, \eta^2 = 0.05$ , where individuals in the Enthusiastic ( $M = 17.22; SD = 6.89$ ) and Dissonant classes ( $M = 16.97; SD = 5.84$ ) had significantly higher scores than individuals in the Indifferent ( $M = 14.79; SD = 5.24$ ) and Romantic ( $M = 13.97; SD = 4.49$ ) classes. However, all four classes showed average scores, below the cutoff of 24 established by McBride et al. (2008). Yet, individuals in the Enthusiastic and Dissonant classes both scored higher than the current sample mean of 15. Finally, chi-squared analyses revealed small to medium significant differences between classes in terms of both romantic attachment dimensions, specifically avoidance,  $\chi^2(6, N = 566) = 10.43, p = 0.043, \phi' = 0.16$ , and anxiety,  $\chi^2(6, N = 566) = 12.58, p = 0.042, \phi' = 0.16$ . As shown in Table 3, the Dissonant class had a significantly higher proportion of avoidant individual (69%) compared to the three other classes (respectively, 58% in Indifferent, 57% in Romantic and 56% in Enthusiastic). In terms of attachment anxiety, the Dissonant class had a significantly higher proportion of anxious individuals (74%) as compared to the Romantic (67%) and Enthusiastic (66%) classes, but not compared to the Indifferent class (70%).

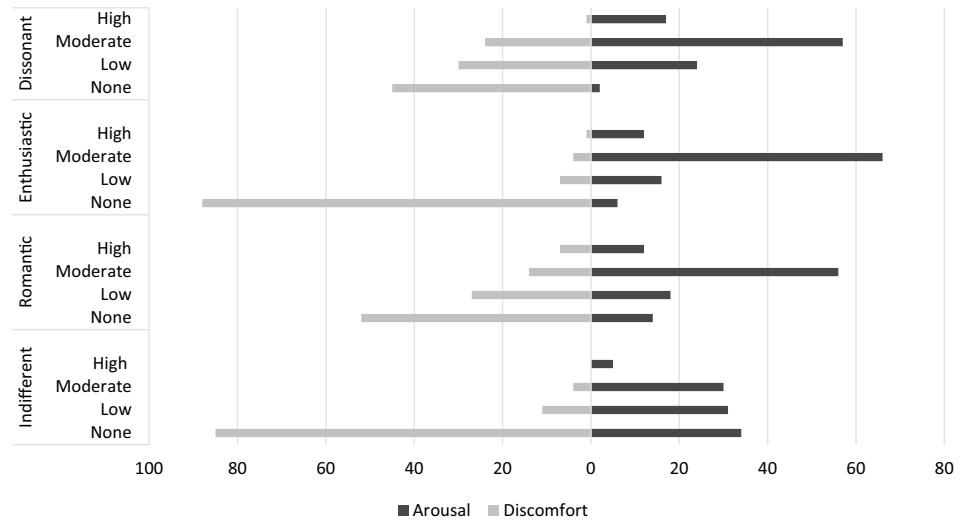
**Table 2** Fit statistics for LCA models with two to six latent classes

No. of classes	Log-likelihood	AIC <sup>a</sup>	BIC <sup>b</sup>	aBIC	Entropy
2	-4409.59	8917.19	9129.78	8974.78	0.73
3	-4275.95	8699.90	9033.73	8786.04	0.75
4	-4203.10	8604.21	9020.96	8719.45	0.77
5	-4157.57	8563.14	9101.12	8705.56	0.76
6	-4117.06	8532.11	9178.56	8707.48	0.78

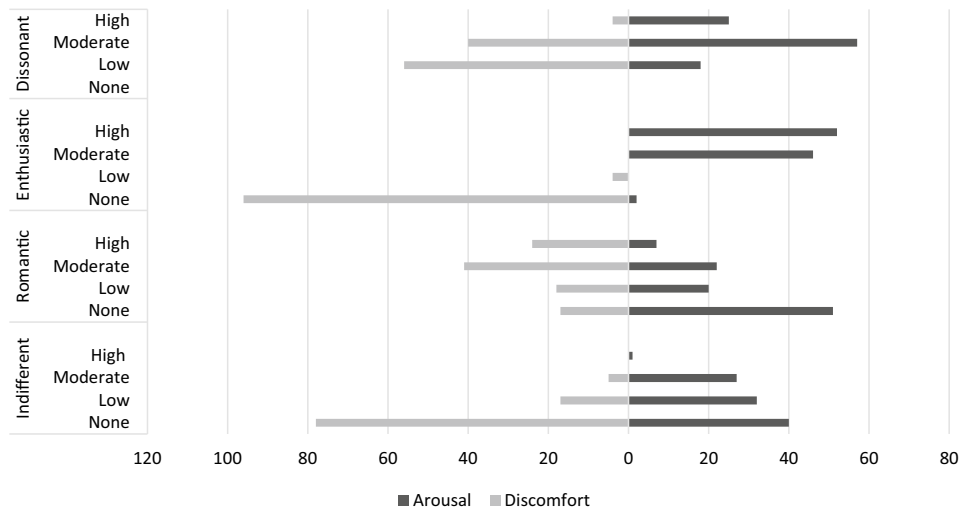
<sup>a</sup>Akaike's Information Criterion, <sup>b</sup>Bayesian Information Criterion

than the rates in other classes. The second class ( $n = 124$ ) is labeled *Romantic* since most individuals in this class reported elevated discomfort and low arousal in response to all scenarios, except for the romance one where the majority expressed moderate to elevated arousal (68%), and no or low discomfort (79%). The third class labeled *Enthusiastic* ( $n = 149$ ) consists of individuals with a tendency to report elevated arousal and low discomfort toward all scenarios. For example, in their responses toward the submission/masochism scenario, 52% reported high arousal compared to 1–25% in other groups, and 96% reported no discomfort compared to 0–78% in other groups. The final and smallest class ( $n = 82$ ) is labeled *Dissonant*. While at first glance this class seems similar to the Romantic class in terms of responses to the romance scenario (elevated arousal and low discomfort), differences are observed in regard to the other three scenarios. Indeed, unlike the Romantics who reported elevated discomfort and absent to low arousal toward other scenarios, individuals in the Dissonant class tended to report a level of discomfort

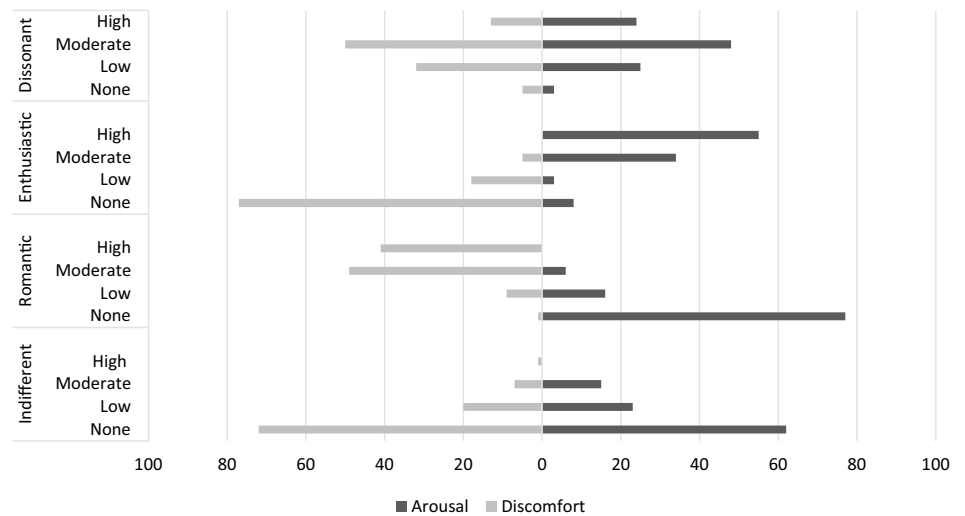
**Fig. 1** Class description: Arousal and discomfort response percentages (%) toward romance scenario



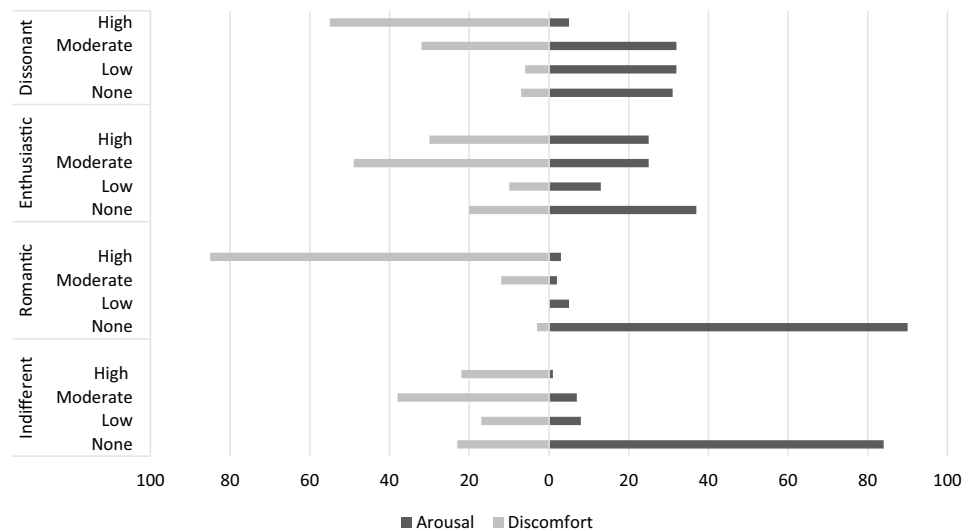
**Fig. 2** Class description: Arousal and discomfort response percentages (%) toward submission/masochism scenario



**Fig. 3** Class description: Arousal and discomfort response percentages (%) toward dominance/sadism scenario



**Fig. 4** Class description: Arousal and discomfort response percentages (%) toward sexual violence scenario



**Table 3** Univariate comparison between classes on sociodemographic and psychosexual characteristics ( $n = 566$ )

Sociodemographic	Indifferent %(n)	Romantic %(n)	Enthusiastic %(n)	Dissonant %(n)	Statistic $\chi^2$	Sig <i>p</i>	Effect size $\varphi$
<i>Gender</i>							
Male	53 (106) <sup>a</sup>	39 (46) <sup>a</sup>	47 (68) <sup>a</sup>	39 (30) <sup>a</sup>	7.86	0.048*	0.12
Female	47 (95) <sup>a</sup>	61 (73) <sup>b</sup>	53 (76) <sup>a</sup>	61 (47) <sup>b</sup>			
<i>Sexual orientation</i>							
Homosexual	26 (54)	23 (28)	19 (28)	19 (16)			
Heterosexual	44 (92)	49 (61)	38 (57)	48 (39)	14.82	0.096	0.09
Bisexual	17 (35)	19 (24)	31 (46)	21 (17)			
Other	14 (30)	9 (11)	12 (18)	12 (10)			
Psychosexual characteristics	Indifferent %(n)	Romantic %(n)	Enthusiastic %(n)	Dissonant %(n)	Statistic $\chi^2$	Sig <i>p</i>	Effect size $\varphi$
Avoidant attachment (above cutoff)	58 (95) <sup>a</sup>	57 (62) <sup>a</sup>	56 (71) <sup>a</sup>	69 (51) <sup>b</sup>	10.43	0.043*	0.16
Anxious attachment (above cutoff)	70 (115) <sup>ab</sup>	67 (72) <sup>a</sup>	66 (84) <sup>a</sup>	74 (55) <sup>b</sup>	12.58	0.042*	0.16
Childhood sexual abuse survivors	12 (39) <sup>a</sup>	12 (8) <sup>a</sup>	23 (18) <sup>b</sup>	20 (10) <sup>a</sup>	8.05	0.045*	0.13
	Indifferent <i>M</i> ( <i>SD</i> )	Romantic <i>M</i> ( <i>SD</i> )	Enthusiastic <i>M</i> ( <i>SD</i> )	Dissonant <i>M</i> ( <i>SD</i> )	Statistic Welch's <i>F</i>	Sig <i>p</i>	Effect size $\eta^2$
Sexual compulsion score	14.79 (5.24) <sup>a</sup>	13.97 (4.49) <sup>a</sup>	17.22 (6.89) <sup>b</sup>	16.97 (5.84) <sup>b</sup>	7.94	<0.001*	0.054

\*Indicates statistical significance at  $p < 0.05$ . Proportions and means that do not share the same superscript letters on the same line statistically differ at  $p < 0.05$  in Bonferroni-corrected post hoc comparisons

<sup>a, b</sup>Represent Bonferroni-corrected post hoc comparisons (in  $\chi^2$  analyses)

## Discussion

The goal of this study was to examine patterns of reactions toward proposed fantasy scenarios, in order to identify different classes and to compare the profiles based on

the participants' psychosexual characteristics. The results yielded four classes (Indifferent, Romantic, Enthusiastic, and Dissonant) based on the participants' patterns of reactions (i.e., arousal and discomfort) toward four sexual fantasy



scenarios (i.e., romance, submission/masochism, domination/sadism, and sexual violence).

Participants in the Indifferent class were characterized by low arousal along with low discomfort toward all scenarios. Participants from the Romantic class reported elevated arousal with low discomfort for the romance scenario, but very low arousal along with high discomfort toward all other scenarios. Participants from the Enthusiastic class were characterized by their elevated arousal along with low discomfort toward all scenarios. They also presented the highest proportion of CSA and the highest scores on the sexual compulsion scale. Participants from the Dissonant class reported elevated arousal paired with discomfort toward all scenarios. They also reported more attachment insecurities than participants from other profiles. The Romantic and Dissonant classes regrouped the highest proportion of women.

As mentioned above, these results highlighted specific links between the four classes and the studied psychosexual characteristics: gender, CSA experiences, sexual compulsion, and romantic attachment. Regarding gender, the results highlighted a significantly higher proportion of women in the Romantic and Dissonant classes as compared to the two other classes. This is congruent with the sexual script theory, highlighting that differences in how men and women relate to their sexuality stem from gender socialization of traditional gender roles (Simon & Gagnon, 1986). In this instance, the highest proportion of women in the Romantic class may be explained by the fact that women are traditionally expected to focus on and prefer the romantic aspects of sexuality (e.g., sexuality within the context of marriage/romantic love). Furthermore, while research has established that both men and women may experience complex patterns of both positive (e.g., arousal) and negative (e.g., discomfort) affects in their sexual responses (Peterson & Janssen, 2007), our results showed a significantly higher proportion of women in the Dissonant class. These results could be partially explained by the double standards found in gender socialization, causing women to feel disproportionately stigmatized or ashamed of their sexuality (i.e., “slut shaming”; Crawford & Popp, 2003). Such gendered socialization differences may contribute to levels of discomfort reported by women when experiencing arousal for scenarios other than romance. Our findings are also congruent with a study by Gold and Gold (1991) which found that women reported significantly more negative emotions in response to their first sexual fantasy (i.e., guilt, disgust) when compared to men.

In examining class differences regarding CSA experiences, the traumatic sexualization dimension of Finkelhor and Browne’s (1985) model might shed some light on the topic. Indeed, sexuality may become a more prominent or pre-occupying part of an individual’s life following CSA, which can lead to either hypersexuality or avoidance of sexuality in adulthood (Finkelhor & Browne, 1985; Vaillancourt-Morel

et al., 2015). The present study’s results suggest that CSA may also affect individuals’ reactions toward sexual fantasies. In our study, the Enthusiastic class regrouped the highest proportion of CSA survivors; this may possibly be explained by the association between CSA and compulsive sexual behaviors in adulthood (Aaron, 2012), where high levels of arousal in reaction to multiple fantasies may be a reflection of compulsive tendencies. This is further supported by the high scores on the sexual compulsivity scale obtained by the Enthusiastic class when compared to the other classes. Indeed, CSA experiences might play a part in the relatively high sexual compulsivity that characterizes the Enthusiastic class.

In previous research, authors suggested that fantasy scenarios and arousal toward them may present a way for survivors to regain control of their trauma by recreating similar scenarios in a controlled fantasy environment, leading to a sort of triumph over the trauma (Briere et al., 1994; Stoller, 1987). Our results indicated that participants in the Enthusiastic class reported arousal toward all scenarios, including sexual violence. The arousal reported by CSA survivors in the Enthusiastic class could thus reflect a psychological mechanism rooted in an attempt to regain control over their sexuality through finding pleasure in a sexual realm that was previously marked with trauma. These findings add to the few previous studies which suggested that CSA’s impact goes beyond sexual functioning or behaviors and may also influence the relationship that individuals have with this highly private and personal sphere of sexuality (Prentky et al., 1989; Woodworth et al., 2013).

However, our results also showed that participants within the Enthusiastic and Dissonant classes had significantly higher scores on the sexual compulsion scale, compared to participants in other classes. Dyer et al. (2016) found that increased sexual compulsivity is associated with a greater frequency of fantasies, which could explain our results where the highest compulsivity scores were also found in the two classes that reported the most arousal toward the fantasy scenarios. Therefore, it is possible that higher compulsive individuals tend to experience more fantasies, which might expose them to a greater diversity of sexual stimuli. This could lead them to be more flexible in their arousal (i.e., aroused by a variety of sexual scenarios; Diamond, 2016).

The current results also yielded interesting differences between classes concerning romantic attachment. Specifically, the highest proportions of individuals who ranked as avoidant or anxious were found in the Dissonant class. This finding may be understood through the lens of scientific literature on romantic attachment. Studies have found that avoidant individuals tend to report discomfort with sexual behaviors in the context of romance or a romantic relationship (Birnbaum, 2010). In the present study, the Dissonant class reported the highest levels of discomfort with the

romance scenario compared to other classes, which would be consistent with this avoidant attachment trait. As for anxious individuals, they are more commonly found in the Romantic class, as research shows they tend to focus on the aspects of sexuality that promote emotional intimacy with a partner (Birnbaum, 2010; Birnbaum et al., 2008). However, previous studies have also revealed that highly anxious individuals tend to repress their own sexual preferences in order to prioritize intimacy enhancing behaviors (Birnbaum et al., 2008, 2010). This phenomenon could explain why these individuals were found in the class that expresses both arousal and discomfort for multiple sexual scenarios. Anxious individuals who express more diverse arousal patterns may be more uncomfortable with these scenarios, due to relational concerns (e.g., fear of partner's judgment), and experience frustrations with arousal (Birnbaum, 2010). These findings suggest that both dimensions of romantic attachment influence reactions toward sexual fantasies. This again reinforces the idea that psychosexual characteristics have potential impacts on one's relationship with sexual fantasies.

### Limitations and Future Research

Despite our findings, this study contains certain limitations that provide stepping stones for future research. First, social desirability biases can influence self-reported data. Although the anonymous context of this online study is a strength in examining such sensitive topic, it remains possible that results were influenced by social desirability. Second, it is important to consider that the current sample differed significantly from the general populations of Canada and the USA. Indeed, while the gender distribution is similar to that of both populations, where about 50% of individuals identify as female, the mean age was lower than in both populations (i.e.,  $M=40$  in Canada and 38 in the U.S.; Statistics Canada, 2015; United States Census Bureau, 2018). Furthermore, the representation of LGBTQ individuals in the current sample was higher than rates documented in the general populations, where 1.7% of Canadians identify as homosexual (Statistics Canada, 2017) and 4.5% of the U.S. identify as LGBT (Statista, 2018). This may be explained by the use of social media platforms like *Tumblr* for recruitment, which have a strong LGBTQ presence (Cavalcante, 2019). In addition, rates of CSA in the general population (25% in women, 10% in men; Vaillancourt-Morel et al., 2016) were not replicated in our sample with only 14% of women and 12% of men reported CSA experiences. However, the mean score for sexual compulsion in our sample was similar to scores found in previous studies on samples from the general population (i.e., 13.8 in women and 17.1 in men; Dyer et al., 2016). Finally, regarding romantic attachment, our sample presented similar prevalence rates than past research on the general population of Canada regarding detached and preoccupied

attachment styles (14% and 24%, respectively, compared to 20% and 10–15%, Brassard & Lussier, 2009). Lower rates of secure attachment style (16% vs. 20–55%) and higher rates of fearful attachment style (44% vs. 10–15% fearful) were seen as well. Considering that the current sample appears significantly different from the general population, these results should be replicated in larger samples, more representative of the general Canadian and U.S. populations. It would also be interesting to examine these patterns in clinical samples consulting for relational and/or sexual difficulties to confirm the presence of the identified classes in patients experiencing sexual difficulties. Finally, the study allowed to measure reactions of arousal and discomfort in response to written sexual scenarios, which does not allow an accurate representation of individual's relationships to their own personal fantasies, or of the full range of potential reactions (e.g., fear, anxiety). Future analysis needs to be conducted on individualistic personal fantasies and an individual's reactions toward their own fantasies to better understand the relationship between fantasies and their impact on sexuality.

### Conclusion

Despite these limitations, this study can be seen as a step toward a deeper understanding of the relationship that individuals have with sexual fantasies, and how this relationship is integrated in sexuality as a whole. To the extent of our knowledge, this was the first study that used fantasy scenarios and measured reactions of both arousal and discomfort toward sexual fantasies in a sample from the community. Previous focus in research has been on perpetrators of sexual violence and their arousal toward violent/abusive versus nonviolent scenarios (Harris et al., 2012; Lalumière et al., 2017). This study is the first to offer scenarios specific to themes of romance, consensual submission/masochism, and domination/sadism practices in addition to sexual violence. Furthermore, the differences found between our four classes (i.e., Indifferent, Romantic, Enthusiastic and Dissonant) in terms of gender, CSA, sexual compulsion, and romantic attachment highlight two important points. First, that an individual's reactions toward sexual fantasies may provide insight into their overall relationship with sexuality, and second, that psychosexual characteristics and traumatic life experiences are linked with sexual fantasies, meaning these factors may have potential impacts on the relationship that individuals have with the most personal sphere of their sexuality. Hence, understanding the relationship with sexual fantasies seems to be a key element in our comprehension of the relationships that individuals have with their sexuality.

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**Declarations**

**Conflict of interest** The authors declare that they have no conflict of interest.

## Appendix

### Romance Vignette

Skyler gently stroked Jesse's face, as they gazed into the depths of each other's eyes. Skyler's thumb ran slowly over Jesse's quivering lips, preparing them for the passionate kiss that was going to follow. Jesse's arms were wrapped around Skyler's shoulders, delighted by the soft warmth of Skyler's skin. Jesse reveled in the tender comfort of holding Skyler close. Skyler's lips left Jesse's, and started tracing kisses down Jesse's neck, to naked and swollen nipples. Skyler's tongue was teasing them. Jesse sighed in pleasure. Skyler's hands explored further down Jesse's waist, buttocks and entire body, caressing every inch, slowly, lightly...

### Submission/Masochism Vignette

Avery tensed while Sam tightened the rope around Avery's wrists. Avery quivered with anticipation. Sam leaned over with a piece of cloth in hand, whispering firmly "look at me". Avery obeyed, excited at the thought of getting blindfolded. Sam tied the cloth around Avery's eyes. A rush of adrenalin cursed through Avery's body as excitement rose, waiting, unable to see or move, defenseless. Avery felt Sam moving closer, Sam's hands ran along Avery's body. A sharp pain

startled Avery as Sam pinched both nipples. Avery moaned in response to the stinging sensations as Sam pinched harder.

### Domination/Sadism Vignette

Drew smiled wickedly at the sight of Jamie kneeling on the floor. Jamie was staring at Drew's feet. "Are you sure you want to do this?" asked Drew. Jamie nodded. Drew feeling increasingly excited, tugged on the leash around Jamie's neck, pulling towards the bed. "Now climb up!" Drew ordered sharply, smiling as Jamie executed the command. Drew moved behind Jamie, stroking the slave's buttocks, taking a moment to drink in the sight of Jamie waiting obediently... Then Drew struck, hard with the back of the hand. Jamie jerked forward but was held in place by Drew tugging back on the leash. Drew struck again, excited by the sound of Jamie's soft groans.

### Sexual Violence Vignette

Chris shoved Taylor forcefully as Taylor tried to walk away, trapped between Chris and the wall. Panic-stricken, Taylor screamed "Let go of me Chris!", while trying to escape Chris's grasp. Chris took a moment to watch Taylor's frantic movements, excited by Taylor's resistance. "Stop struggling!" Chris finally yelled, holding Taylor's hands back. "Stop struggling or I'll really hurt you!", Chris slapped Taylor across the face, hard. Taylor stopped moving reluctantly. Chris took the opportunity and grabbed Taylor's waist, holding it still with one hand. The other hand started roughly groping Taylor's body.

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