



# Aggressive and Humiliating Sexual Play: Occurrence Rates and Discordance Between the Sexes

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## Abstract

The present study attempted to understand people's desires for aggressive and humiliating sexual play, both in terms of interests and fantasy. An evolutionary framework has been developed which generated five hypotheses to be tested. Evidence from a qualitative study of 102 participants identified 13 aggressive and sexual acts which were commonly preferred. A subsequent quantitative online study of 1026 men and women asked participants to rate the desirability of these acts. The results indicated that more than 70% of participants found at least one aggressive or humiliating sexual play desirable, whereas about half of the participants found at least three such acts desirable. Significant sex differences were also found, with men desiring to engage in such play more than women. This discordance was moderated by the willingness of each party to partially accommodate each other's desires. On the basis of these findings and the proposed theoretical framework, it is concluded that aggressive and humiliating sexual play constitutes a normal variation in sexual desire.

**Keywords** Aggressive sexual play · Humiliating sexual play · Masochism · Sadism · Sex differences

## Introduction

People frequently indicate an interest for sexual play that involves aggressive and humiliating sexual acts (Janus & Janus, 1993; Kinsey, Pomeroy, & Martin, 1948; Långström & Hanson, 2006). For instance, a recent study in Canada found that about one in five participants indicated a desire for masochistic acts (Joyal & Carpentier, 2017). This kind of play appears to be harmful for those involved, which in turn, raises the question why there are so many people that find it desirable. Yet, despite the high occurrence of these desires in the population, there has been limited effort in explaining why people have such desires; that is to say, if they have a function and what this function may be (Dawson, Bannerman, & Lalumière, 2016; Quinsey, 2012). This endeavor is even more challenging if an evolutionary perspective is adopted. Taking into consideration that aggressive and humiliating sexual play may be potentially harmful or drive partners away, we would expect selection forces to have acted against any dispositions to prefer this type of sexual

play. The relatively high occurrence of these desires suggests an evolutionary function, which currently remains obscure.

Accordingly, the current study had four goals, (1) To develop an evolutionary framework that accounts for the desire for aggressive and humiliating sexual play, and to employ this framework in order to generate specific hypotheses to be tested, (2) to identify the most common aggressive and humiliating sexual acts people desire, (3) to estimate the degree of desire for this type of sexual play, both in terms of interest and fantasies, and (4) to estimate the degree of discordance between the sexes over their desire for aggressive and humiliating sexual play.

## Current Literature

Sexual desires can take at least two forms, namely an interest to engage in an act and a fantasy to engage in an act (Leitenberg & Henning, 1995). Regarding the interest to engage in an act, the first large-scale investigations that included measures of paraphilic behaviors were the Kinsey studies which, by employing non-representative samples (Kinsey et al., 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953), found that 24% of men ( $N=5300$ ) and 12% of women ( $N=5940$ ) had at least some erotic response to sadomasochistic stories (i.e., acts that involved the receipt or infliction of pain or humiliation). Janus and Janus (1993) employed a representative sample of

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2765 American adults, and reported a lifetime prevalence of 14% in men and 11% in women for sadomasochism, and 11% in men and 11% in women for domination or submission. Another study employed a representative sample of 2450 men and women from a 1996 national survey of sexuality and health in Sweden, and found that 11.6% of the participants responded positively to the question “Ever sexually aroused by deliberately using pain” (Långström & Hanson, 2006).

A Brazilian study based on face-to-face interviews with 7022 individuals (the sample was not representative), 9% of the participants reported that they had practiced sadomasochism at least once in their lifetime (Oliveira & Abdo, 2010). Moreover, a Canadian study combined online and telephone interviews, in a representative sample of 1040 adults, in order to investigate the desire and experience of several paraphilias (Joyal & Carpentier, 2017). About 20% of the participants indicated a desire for masochistic acts and about 5% a desire for sadistic acts. In this study, women reported significantly higher rates of masochistic desires and experience than men. Another study assessed the interest in paraphilic activities in a non-representative sample of 1226 Canadian individuals (Dawson et al., 2016). With respect to sadism, 19% of men and 10% of women, and with respect to masochism, 15% of men and 17% of women, indicated arousal.

Proceeding to the aspect of sexual fantasies, Leitenberg and Henning (1995) performed a literature review, and they reported that men fantasized more about domination, whereas women fantasized more about submission. An American study of 137 college women investigated sexual fantasies involving force or coercion against the fantasizer (Strassberg & Lockerd, 1998). The results indicated that more than half of the subjects reported having a forced-sex fantasy.

An online Canadian study, which employed a non-representative sample of 1516 individuals, asked participants to rate several sexual fantasies (Joyal, Cossette, & Lapierre, 2015). It was found that significantly more women (64.6%) than men (53.3%) fantasized about being dominated sexually, while significantly more men (59.6%) than women (46.7%) fantasized about sexually dominating someone. Furthermore, significantly more men (39.6%) than women (26.9%) fantasized about spanking or whipping someone to obtain sexual pleasure, and significantly more women (36.3%) than men (28.5%) fantasized about being spanked or whipped to obtain sexual pleasure. Finally, about an equal percentage of men (30.7%) and women (28.9%) fantasized about being forced to have sex, but significantly more men (22%) than women (10.8%) fantasized about forcing someone to have sex.

The studies above were limited in not providing an actual occurrence rate for desires for aggressive and humiliating sexual play. Furthermore, most of these studies investigated sadistic and masochistic desires as an aspect of paraphilia (e.g., Dawson et al., 2016). By grouping these questions with questions measuring different paraphilias, such as having a desire

to have sexual intercourse with a child, participants may have been reluctant to answer positively, even if they had a desire for aggressive and humiliating sexual play, because they may have worried that they would be classified as deviant.

Another limitation of the existing literature is that it does not provide a theoretical account of such desires. The few theoretical attempts approached the subject as deviant and dysfunctional behavior, and tried to explain it by attempting to understand “what is wrong” (Holmes & Holmes, 2008). Such analysis is limiting in explaining desires for aggressive and humiliating sexual play, which appears to be a common in the population. Accordingly, we aim to provide a theoretical framework which can account for these desires, and can be employed in generating hypotheses about them.

Before proceeding, it should be said that most literature uses the term “sadism” to connote a desire for inflicting pain on a partner and “masochism” to connote a desire for suffering physical pain and humiliation. In the rest of the article, we will not be using these terms; firstly, because this categorization does not capture the full extent of aggressive and humiliating sexual play, and secondly, because it suggests deviant behavior, although we believe that desires of this kind constitute normal variation in sexual behavior.

## The Nature of Sexual Play

Women divert more parental investment to their children and, as a consequence, they become the scarce reproductive resource to which men strive to gain access (Trivers, 1972). One way to achieve this goal is to fight other men and monopolize access to women (Puts, 2010). As a consequence, male–male competition arises, which is a selection force that favors adaptations such as aggression and physical strength that enable men to fight other men and gain reproductive access to women (Andersson, 1994; Puts, 2010). There is sound evidence that, during human evolutionary time, violent conflict was frequent, and male–male competition was strong (Puts, 2010, 2016). When male–male competition is strong, men would frequently monopolize access to the women of their opponents. In this case, consenting to sexual intercourse is not optimal for women, as these men are not their choice.

Moreover, men may follow a forced-sex mating strategy, where they force sex on women when the costs of doing so are low (Thornhill & Palmer, 2000; for a summary of the various criticisms of this theory, see Travis, 2003). Rape is commonly reported in contemporary and historical pre-industrial societies (Rozée-Koker, 1987; Sanday, 1981), suggesting that it has also been common in ancestral pre-industrial societies. Such strategies are against women’s interests. For instance, in war-rape, a woman is likely to be left pregnant and raise the child on her own (Sugiyama, 2014). Thus, women would resist such male strategies (Thornhill & Palmer, 2000). Last but not least, there is evidence that in ancestral human

societies mate choice was regulated (Apostolou, 2012, 2014). The mate preferences of daughters are not aligned with the in-law preferences of their parents (Apostolou, 2015; Buunk, Park, & Dubbs, 2008; Perilloux, Fleischman, & Buss, 2011), which suggests that women would frequently find themselves married to men who do not comply with their preferences. Accordingly, they would have the incentive to resist sex and/or seek extramarital partners of their own choice.

In summary, there are good reasons to believe that during human evolutionary time, men and women came recurrently across the situation where their interests were not aligned. In severe instances, it would be to men's fitness interest to have sex with these women, but it would not be to women's fitness interest to have sex with these men. As a consequence, selection pressure would be exercised on women to resist having sex with these men. For instance, women may become aggressive and resistant to allow sexual access or to seek other sexual outlets of their own choice. In turn, selection pressure is exercised on men to evolve mechanisms that would enable them to bypass women's resistance and maintain exclusive control over their reproductive capacity.

## Hypotheses to be Tested

We propose that a preference to perform aggressive and humiliating sexual acts on a partner has predominantly evolved to enable men to bypass women's resistance, but also to intimidate and warn them about the consequences of infidelity or running away. For instance, a man who is aggressive during sexual intercourse signals that he can be even more aggressive in case of infidelity (see also Goetz, Shackelford, Romero, Kaighobadi, & Miner, 2008). Thus, men are likely to have evolved a predisposition to desire performing aggressive sexual act on women. On this basis, we predict that:

**H<sub>1</sub>** A substantial proportion of men would exhibit interest and fantasy about performing aggressive and humiliating sex on the partner.

As discussed above, when men attempt to force sex on women, the latter would resist it by hitting, biting or spitting on their partners (Thornhill & Palmer, 2000). If men would find such resistance sexually undesirable, doing so would compromise their forced-sex mating strategy, since it would lead them to discontinue sexual intercourse. To put it differently, men who would find such resistance sexually exciting would be more effective in applying such strategy than those who would be indifferent or who would find such a reaction repulsive. Accordingly, it is predicted that:

**H<sub>2</sub>** A substantial proportion of men would exhibit interest and fantasy for aggressive and humiliating sexual acts to be performed on them.

Men and women have not only conflicting interests, but converging interests as well. It is to both sexes' reproductive interest to form a stable long-term relationship, in which children can be born and raised (Buss, 2017). During human evolutionary time, women would recurrently find themselves to be with long-term partners who have a desire for aggressive and humiliating sex. We propose that it would benefit women to partially accommodate this desire in order to promote better intimate relationships. More specifically, women not accommodating their partners' desires could lead to negative consequences, such as escalated aggression and an increased chance of cheating. A taste for aggressive and humiliating sex to be performed on self and on partner would be a way to accommodate partners' preferences and not suffer these costs. On this basis, we predict that:

**H<sub>3</sub>** A substantial proportion of women would exhibit interest and fantasy for aggressive and humiliating sexual play.

Having the capacity to accommodate partners' desires does not mean that women's desires will completely align to men's. In the proposed framework, men's desires aim to bypass resistance and promote control over partner; thus, it would not be to the best interest of women to fully comply with their partners' desires, as doing so would lead to an elevated risk of being injured, lose space to exercise choice, and being totally dominated by a partner. Thus, women's desires for aggressive and humiliating sexual play do not completely converge with the respective desires of men. In particular, it is predicted that:

**H<sub>4</sub>** Men would desire to engage in aggressive and humiliating sexual play more than women.

Furthermore, converging interests over mating suggest that both men and women would be willing to allow aggressive and humiliating sexual acts to be performed on self, even if this is not in compliance with their desires, in order to provide satisfaction to their partners. On this basis, it is predicted that:

**H<sub>5</sub>** The discordance that arises from the divergence in desires would be lowered by people's willingness to accept behaviors in order to satisfy their partners.

## Study 1

The purpose of this study was to identify the most common desirable acts of aggressive and humiliating sexual play.

## Method

### Participants

Two research assistants were employed for the purposes of this study. They recruited individuals who volunteered to take part in research about sexual behavior (no payment was given). The prerequisite for participation was to be an adult (18 years old or older). A snowball sampling technique was used, where the research assistants recruited first several participants, and then obtained references for other participants who were likely to be interested in participating. The first wave of participants was recruited online through an advertisement that was placed at the university's website and from the university's administrative staff and students.

The study took place in the Republic of Cyprus, and participants came predominantly from its two largest cities, Nicosia and Limassol. The data collection process lasted approximately 1 month. The participants were initially asked to sign a consent form, and subsequently they were given the survey. They were instructed to complete the questionnaire privately. Upon completion, they inserted the questionnaire in an unmarked envelope and sealed it.

A total of 102 Greek-Cypriots took part (50 women, 52 men). The mean age of women was 26.8 years ( $SD = 8.7$ ), and the mean age of men was 28.3 years ( $SD = 9.4$ ). A total of 40% of the participants were in a relationship, 29% were married, 23.6% were single, and 7.4% were divorced.

### Measures and Procedure

The survey had two parts. In the first part, participants were asked to indicate any acts which involved elements of aggression and humiliation that they would prefer to engage in, or they would fantasize to engage in, during sexual intercourse. More specifically, they were asked to indicate the acts that they would like to perform on a partner or their partner to perform on them. Participants were specifically instructed to leave this section blank if they did not have any such preferences. In the second part, demographic information was collected.

## Results

In order to create a list of sexual acts that individuals desired, acts with identical or very similar wording were eliminated by two independent graduate students (a man and a woman) who were recruited for this purpose. The students were selected on the basis of having completed a qualitative research methods

course, and of having prior experience in qualitative data analysis.

In instances where two or more acts were very similar, one was retained and the rest were dropped. In addition, acts that contained multiple behaviors were eliminated as these were difficult to interpret. Finally, acts with unclear or vague wording were also eliminated. If there was disagreement about retaining a given item, this was resolved by consulting one of the authors. As our purpose was to identify the most common aggressive and humiliating sexual acts people desire, we included only items which had a reported frequency of 10 or more in the construction of the final list. Overall, 13 such acts were identified, which are shown in Table 1. Note that these acts were found in both active (i.e., to perform on partners) and passive (i.e., to be performed on self) forms, but in order to save space, we have stated them only in the latter form. Finally, note that only four participants did not report any such acts, i.e., they left the relevant section blank.

### Study 2

The purpose of this study was to estimate the occurrence of the desires for aggressive and humiliating sexual play, and to test the hypotheses derived from the proposed evolutionary framework.

**Table 1** The factor structure for aggressive and humiliating sexual play

	Factor loadings	
	On self	On partner
<i>Aggressive sexual play</i>		
Ties me	.81 (.03)	.84 (.04)
Handcuffs me	.79 (.04)	.85 (.09)
Pulls my hair	.76 (.09)	.59 (.21)
Bites me	.74 (.18)	.76 (.12)
Slaps me	.61 (.23)	.36 (.28)
Treats me aggressively	.58 (.29)	.60 (.29)
Looks at me aggressively	.58 (.17)	.64 (.10)
Hits me	.54 (.29)	.32 (.21)
Does things to me without asking	.39 (.12)	.48 (.12)
<i>Humiliating sexual play</i>		
Swears at me	.84 (.10)	.84 (.03)
Humiliates me	.83 (.03)	.89 (.09)
Spits on me	.68 (.00)	.81 (.11)
Talks dirty to me	.56 (.17)	.48 (.34)

In order to see the degree of cross-loading, we present the factor loadings for all the items on both factors, and we have placed in parenthesis the factor loadings for the factor that the acts do not load

## Method

### Participants

The research was performed online. We chose this method because of the sensitive nature of the study, and assumed we could get more honest answers in this way (Kreuter, Presser, & Tourangeau, 2008; Link & Mokdad, 2005). We employed different approaches to recruit participants, (1) We posted the link of the study to the official website and Facebook profile of the university; (2) we employed institutional mailing lists; (3) we contacted university academic and non-academic staff, and; (4) we asked post-graduate students registered in psychology classes to forward the link of the study to their relatives, friends, and acquaintances, and to share also the link in their Facebook profiles.

The study was in Greek and the participants were Greeks and Greek-Cypriots. In this study, 1026 individuals took part (573 women, 453 men). The mean age of women was 29.2 years ( $SD = 11.4$ ), and the mean age of men was 29.8 years ( $SD = 10.3$ ). A total of, 39.3% of the participants were in a relationship, 36.3% were single, 30% were married, and 4.4% were divorced.

### Measures and Procedure

The survey was constructed using Google forms and it had two parts. The first part was composed of five sections. In the first section, participants were asked to indicate the degree they desired that during sexual intercourse their partners performed on them the 13 acts identified in Study 1. More specifically, participants were given the statement “During sexual intercourse, I would like my partner to” and they were provided with the 13 acts to rate. In the second section, participants were asked to indicate the degree of desire to perform these acts on their partners during sexual intercourse. The participants were given the statement “During sexual intercourse, I would like to” and they were provided with the 13 acts to be performed on the partner to rate.

In the third section, participants were asked to indicate the degree that they fantasized about their partners performing the 13 acts on them during sexual intercourse, while in the fourth section they were asked to indicate the degree they fantasized about performing themselves these acts on their partners during sexual intercourse. Finally, in the fifth section, participants were asked to indicate the degree they would allow their partners to perform the 13 acts on them in order to satisfy them.

Participants’ responses were recorded on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly

agree). In addition, the order of presentation of each section, and the order of presentation of the 13 questions in each section was randomized across participants. Finally, in the second part of the survey, demographic information was collected.

### Statistical Analysis

We applied principal components analysis in order to classify items into aggressive and humiliating acts. We estimated the frequencies of participants’ responses in order to construct a hierarchy of acts by desirability. Moreover, we employed MANCOVA in order to examine sex and age effects in desire for aggressive and humiliating sexual play. Finally, we employed ANCOVA in order to examine whether there were significant differences in desire between aggressive and humiliating sexual play, between interest and fantasies, and between what people desired to be performed on them and what they desired to perform on others.

## Results

Study 1 attempted to identify acts that involved aggression and humiliation. Therefore, the 13 acts needed to be classified in two broad categories, namely aggressive and humiliating acts. To examine whether this was the case, we performed principal components analysis with direct oblimin as a rotation method on the interest in the 13 acts to be performed on self. The results suggested a two-factor solution (eigenvalue  $> 1$ ). The KMO statistic was 0.94, indicating a very good sample adequacy. The scales produced by this analysis were checked by means of reliability analysis (Cronbach’s  $\alpha$ ). For aggressive sexual play, the  $\alpha$  was 0.86 and for humiliating sexual play the  $\alpha$  was 0.74. As can be seen from Table 1, the first factor refers to aggressive sexual play acts, and the second factor refers to humiliating sexual play acts. We performed a similar analysis for the interest in the 13 acts to be performed on a partner, and the results indicated a similar factor structure (Table 1). In this case, the KMO statistic was 0.91, and for aggressive sexual play, the  $\alpha$  was 0.88 and for humiliating sexual play the  $\alpha$  was 0.81.

### Occurrence

Our first goal was to estimate the occurrence rate, and in particular how common it was for an individual to prefer one or more of these acts. Accordingly, if for a specific act, participants gave a score of “4” or “5,” we considered that they found such an act desirable. On this basis, we estimated the percentages of participants in the sample who found such acts desirable for each scenario. The results shown in Table 2, where we can see that 77% of the participants indicated at



**Table 2** The proportion of participants who find aggressive and humiliating sexual acts desirable

Acts	On self-interest		On partner-interest		On self-fantasy		On partner-fantasy		On self-allow	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
At least one	82.6	72.6	83.2	67.7	66.4	64.9	74.8	58.1	79.7	69.3
At least two	65.1	57.1	72.2	48.5	54.7	52.2	63.6	46.8	70.4	53.2
At least three	53.2	41.5	60.5	38.7	42.4	43.5	55	37.7	64.2	51.8
At least four	40.6	31.6	53.4	28.3	31.8	34	45.9	28.1	56.3	43.8
At least five	31.3	23	45.9	18.2	23.8	26.9	40	21.8	47.9	36.5
At least six	22.1	17.5	37.3	11.3	17.2	20.8	36	15.4	38.4	27.9
At least seven	15.7	11.3	30	6.6	13.7	16.1	29.6	10.3	33.6	21.8
At least eight	10.6	6.8	23.8	3.5	10.2	10.5	25.2	5.9	26.7	15.7
At least nine	7.1	4	19.2	2.1	6.6	7.5	17.4	3.3	23	10.5
At least ten	6.2	2.3	13.5	1	5.1	4.4	11.9	1.90	16.1	6.1
At least eleven	3.5	1.2	8.4	0.7	3.8	2.8	9.5	1.70	12.6	4.4
At least twelve	2.4	0.5	5.3	0.3	3.1	1.7	7.5	1.2	9.3	1.9
At least thirteen	0.9	0.2	2.2	0.2	1.8	0.5	3.3	0.3	6.4	0.9

All numbers refer to percentages

least one of these acts to be performed on them as desirable, while nearly half of the participants indicated at least three acts as desirable. Moreover, 74.6% of the participants indicated as desirable to perform at least one of these acts on partner, while nearly half of the participants indicated at least three acts as desirable. These rates were similar, but slightly lower, for sexual fantasies. In addition, with respect to allowing a partner to perform these acts on self, 73.9% of the participants indicated that they would allow at least one act, and more than half of the participants indicated that they would allow at least three acts to be performed on them. Finally, we

can see that the occurrence rates differed between men and women, with the most pronounced differences being over the acts to be performed on partners, where men reported them more frequently as desirable than women did.

We next examined which individual acts were deemed more desirable. To do so, we estimated the percentages of individuals who answered “4” or “5” in each act. The results are shown in Table 3. Starting from the aggressive sexual play, the “Does things to me without asking” was the most preferred act across different scenarios, while the “Hits me” was the least preferred act. With respect to the humiliating

**Table 3** The proportion of participants who find individual sexual acts desirable

	On self-interest		On partner-interest		On self-fantasy		On partner-fantasy		On self-allow	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
<i>Aggressive sexual play</i>										
Ties me	24.6	20.5	37.1	22.2	24.9	27.8	34.6	24.7	43.5	35.3
Handcuffs me	25.8	18.7	35.2	21.3	23.9	27.6	34.7	23.6	44.2	37.4
Pulls my hair	22.1	36	50	26	18.4	33.9	44.3	24.1	36.1	41.4
Bites me	39.1	33.9	44	39.4	26.2	31.6	37.6	33	45.8	37.9
Slaps me	13.5	15.1	34.9	6.5	11.3	15.6	31.2	7.9	24.8	17.7
Treats me aggressively	26.3	25.5	37.3	15.4	26.1	26.7	37.9	19.9	41.9	27.5
Looks at me aggressively	42.5	37.1	36.8	30.4	32.6	34.4	34.2	28.9	57.9	45.1
Hits me	11.7	13.7	25.3	3.9	10.1	10.9	22.9	5.3	21.2	13.7
Does things to me without asking	52.5	33.6	56.2	36.8	44.5	36.7	53.2	34.3	58.4	40.6
<i>Humiliating sexual play</i>										
Swears at me	19.5	6.6	24.5	1.8	16.7	8.2	25.2	5.8	31.6	12.3
Humiliates me	7.5	2.1	15	1.1	7	4	17.4	2.1	12.8	3.1
Spits on me	7.1	1.2	13.1	1.4	7.6	2.6	11.5	2.7	14.6	3.1
Talks dirty to me	49.8	29.2	47.5	21.5	34.6	26.9	38.5	22.4	53.1	36.1

All numbers refer to percentages

sexual play, the “Talks dirty to me” was the most preferred and the “Spits on me” the least preferred act.

## Contingencies

### Sex and Age Effects

In order to examine whether men and women differed in their desires, we applied a MANCOVA, where the sexual play acts were entered as the dependent variables and the participants' sex as the independent variables. Age was also entered as a covariate. We performed this analysis separately for aggressive and for humiliating sexual play for each of the scenarios. Please note that, for our analysis, we employed the raw data without grouping any scores, as was the case above in order to estimate occurrence rates.

Starting from aggressive sexual play on self, we can see from Table 4 that there was a significant main effect of sex. However, the means for men and women were almost the same, suggesting that certain acts were preferred more by men and others more by women. Accordingly, acts such as “Pulls my hair” were preferred more by women, while acts such “Does things to me without asking” were preferred more by men. Also, there was a significant effect of age with a negative coefficient ( $F[9, 888] = 4.69, p < .001, \eta_p^2 = .045$ ), indicating that as people aged, their desire for aggressive sexual play declined.

Moving on to humiliating sexual play, there was a significant main effect of sex, with men preferring it more than women. This difference was significant and in the same direction for all the acts. Also, there was a significant effect of age with a positive coefficient ( $F[4, 898] = 2.66, p = .032, \eta_p^2 = .012$ ), indicating that the desire for humiliating sexual play increased as people aged.

We now turn to examine aggressive sexual play on partners. There was a significant main effect of sex, with men indicating a stronger preference than women. This difference was significant and in the same direction for all the constituent acts. Also, there was a significant effect of age, with a negative coefficient ( $F[9, 873] = 4.50, p < .001, \eta_p^2 = .044$ ). Similarly, with respect to humiliating sexual play, there was a significant main effect of sex, with men indicating a stronger preference than women. This difference was significant and in the same direction for all acts. Finally, there was a significant effect of age with a positive coefficient ( $F[4, 895] = 2.61, p = .034, \eta_p^2 = .012$ ).

With respect to aggressive sexual play individuals would allow to be performed on self in order to satisfy their partners, there was a significant main effect of sex, with men indicating a stronger willingness than women to allow aggressive acts. All significant differences in individual acts were in this direction. Age was also significant ( $F[9, 875] = 2.76, p = .003, \eta_p^2 = .028$ ), with a negative coefficient. A similar

significant effect of sex, but with a larger effect size, was produced for humiliating sexual play. In all acts, the sex difference was significant, with men exhibiting a higher willingness than women. Finally, no significant effect of age was found.

Moving on to sexual fantasies, from Table 5 we can see that, with respect to aggressive sexual play on self, there was a significant main effect of sex, with the means being similar for the two sexes. The sex differences were predominantly over “Pulls my hair,” which was preferred more by women, and over the “Does things to me without asking,” which was preferred more by men. Note, however, that the sex difference over the “Pulls my hair” could stem from men having hair that is too short to pull. Moreover, there was a significant effect of age with a negative coefficient ( $F[9, 873] = 4.50, p < .001, \eta_p^2 = .044$ ). Turning to fantasies for humiliating sexual play, there was a significant main effect of sex, with men indicating a stronger preference than women, a sex difference that was consistent across all acts. In this case, no significant effect of age was found.

With respect to fantasies for aggressive sexual play on partner, there was a significant main effect of sex, with men indicating a stronger preference than women. This difference was significant and in the same direction for all acts. Furthermore, there was a significant effect of age, with a negative coefficient ( $F[9, 858] = 4.46, p < .001, \eta_p^2 = .045$ ). With respect to fantasies for humiliating sexual play on partner, there was a significant main effect of sex, with men indicating a stronger preference than women. This difference was consistent across all acts. Finally, no significant effect of age was produced.

### Additional Main Effects and Interactions

We were interested in examining whether there were significant differences in desire between aggressive and humiliating sexual play, between interest and fantasies, and between what people desired to be performed on them and what they desired to perform on others, as well as possible interactions of these factors with sex. These effects could not be estimated by extending the analysis above, since each category of sexual play contained a different number and type of acts. Therefore, direct comparisons were not possible. Thus, for this purpose, we produced eight new variables, one for each category (e.g., aggressive sexual play on partner) by averaging the scores of the acts in each category. Using these variables, we performed a four-way mixed design ANCOVA, where the type of sexual play (aggressive/humiliating), the type of interest (interest/fantasy), and the target (self/partner) were entered as the within-participants variables, and the sex of the participant was entered as the between-participants independent variable. The age was also entered as a covariate.

**Table 4** Sex differences in the interest for aggressive and humiliating sexual play

	On self			On partner			On partner-allow								
	Total	Men	Women	Total	Men	Women	Total	Men	Women						
	M. (SD)	M. (SD)	M. (SD)	M. (SD)	M. (SD)	M. (SD)	M. (SD)	M. (SD)	M. (SD)						
<i>Aggressive sexual play</i>															
Overall	2.55 (0.89)	2.59 (0.89)	2.52 (0.89)	<.001	.08	2.58 (0.97)	2.92 (0.89)	2.31 (0.84)	<.001	.71	2.83 (1.11)	2.98 (1.14)	2.71 (1.07)	<.001	.24
Ties me	2.39 (1.29)	2.47 (1.34)	2.34 (1.24)	.065	.10	2.52 (1.4)	2.85 (1.43)	2.31 (1.32)	<.001	.40	2.91 (1.49)	3.09 (1.53)	2.86 (1.45)	.008	.15
Handcuffs me	2.39 (1.3)	2.5 (1.37)	2.34 (1.24)	.014	.12	2.5 (1.4)	2.79 (1.49)	2.3 (1.29)	<.011	.35	2.92 (1.52)	3.13 (1.57)	2.85 (1.47)	.003	.18
Pulls my hair	2.69 (1.34)	2.42 (1.3)	2.90 (1.31)	<.001	.37	2.81 (1.42)	3.28 (1.37)	2.47 (1.34)	<.001	.60	2.95 (1.48)	2.88 (1.49)	3.02 (1.46)	.461	.09
Bites me	2.94 (1.25)	3.05 (1.29)	2.88 (1.2)	.003	.14	3.03 (1.33)	3.13 (1.33)	2.94 (1.33)	.010	.14	3.02 (1.45)	3.25 (1.44)	2.93 (1.42)	<.001	.22
Slaps me	2.06 (1.23)	2.05 (1.22)	2.09 (1.25)	.775	.03	2.1 (1.35)	2.73 (1.46)	1.58 (0.99)	<.001	.92	2.22 (1.39)	2.41 (1.47)	2.11 (1.33)	.001	.21
Treats me aggressively	2.52 (1.29)	2.61 (1.32)	2.47 (1.27)	.010	.11	2.46 (1.36)	2.86 (1.42)	2.14 (1.24)	<.001	.54	2.75 (1.48)	3.09 (1.48)	2.56 (1.46)	<.001	.36
Looks at me aggressively	2.98 (1.43)	3.06 (1.43)	2.92 (1.42)	.010	.10	2.78 (1.43)	2.95 (1.44)	2.61 (1.4)	<.001	.24	3.31 (1.52)	3.55 (1.55)	3.17 (1.49)	<.001	.25
Hits me	1.93 (1.17)	1.91 (1.15)	1.95 (1.18)	.850	.03	1.88 (1.22)	2.38 (1.38)	1.46 (0.86)	<.001	.80	2.03 (1.34)	2.26 (1.43)	1.89 (1.25)	<.001	.27
Does things to me without asking	3.1 (1.36)	3.48 (1.27)	2.81 (1.35)	<.001	.51	3.2 (1.4)	3.54 (1.31)	2.88 (1.39)	<.001	.49	3.25 (1.45)	3.66 (1.37)	2.96 (1.42)	<.001	.50
<i>Humiliating sexual play</i>															
Overall	1.87 (0.8)	2.11 (0.9)	1.69 (0.64)	<.001	.49	1.8 (0.93)	2.22 (1.12)	1.46 (0.56)	<.001	.87	2.05 (1.02)	2.37 (1.15)	1.80 (0.82)	<.001	.57
Swears at me	1.86 (1.16)	2.16 (1.3)	1.62 (0.98)	<.001	.48	1.76 (1.21)	2.31 (1.46)	1.34 (0.74)	<.001	.84	2.16 (1.41)	2.67 (1.53)	1.80 (1.21)	<.001	.63
Humiliates me	1.36 (0.84)	1.51 (1)	1.25 (0.67)	<.001	.31	1.43 (0.98)	1.83 (1.31)	1.13 (0.51)	<.001	.70	1.50 (1.05)	1.77 (1.31)	1.32 (0.79)	<.001	.41
Spits on me	1.33 (0.83)	1.50 (1)	1.18 (0.59)	<.001	.39	1.4 (0.97)	1.71 (1.24)	1.14 (0.52)	<.001	.60	1.52 (1.08)	1.81 (1.32)	1.28 (0.76)	<.001	.49
Talks dirty to me	2.93 (1.36)	3.28 (1.37)	2.68 (1.28)	<.001	.45	2.61 (1.44)	3.06 (1.48)	2.25 (1.28)	<.001	.59	3 (1.53)	3.38 (1.54)	2.77 (1.47)	<.001	.40



**Table 5** Sex differences in fantasies for aggressive and humiliating sexual play

	On self					On partner				
	Total	Men	Women	<i>p</i> value	<i>d</i>	Total	Men	Women	<i>p</i> value	<i>d</i>
	M. (SD)	M. (SD)	M. (SD)			M. (SD)	M. (SD)	M. (SD)		
<i>Aggressive sexual play</i>										
Overall	2.40 (1.03)	2.35 (10.1)	2.44 (1.05)	<.001	.09	2.48 (1.09)	2.79 (1.15)	2.25 (0.98)	<.001	.51
Ties me	2.45 (1.44)	2.43 (1.44)	2.49 (1.45)	.953	.05	2.51 (1.44)	2.82 (1.51)	2.31 (1.35)	<.001	.36
Handcuffs me	2.40 (1.43)	2.39 (1.45)	2.46 (1.42)	.943	.05	2.48 (1.45)	2.76 (1.53)	2.29 (1.36)	<.001	.32
Pulls my hair	2.43 (1.44)	2.14 (1.33)	2.67 (1.48)	<.001	.38	2.68 (1.48)	3.12 (1.48)	2.36 (1.40)	<.001	.53
Bites me	2.56 (1.41)	2.54 (1.38)	2.59 (1.43)	.496	.03	2.75 (1.45)	2.89 (1.45)	2.69 (1.42)	.005	.14
Slaps me	1.88 (1.23)	1.85 (1.21)	1.92 (1.27)	.809	.05	2.06 (1.30)	2.61 (1.49)	1.63 (1)	<.001	.77
Treats me aggressively	2.45 (1.41)	2.56 (1.40)	2.42 (1.42)	.049	.10	2.46 (1.45)	2.81 (1.50)	2.20 (1.35)	<.001	.43
Looks at me aggressively	2.71 (1.51)	2.69 (1.50)	2.73 (1.49)	.497	.03	2.64 (1.48)	2.80 (1.49)	2.54 (1.54)	<.001	.17
Hits me	1.77 (1.14)	1.77 (1.13)	1.78 (1.15)	.726	.00	1.84 (1.23)	2.33 (1.44)	1.48 (0.90)	<.001	.63
Does things to me without asking	2.95 (1.46)	3.18 (1.47)	2.81 (1.42)	<.001	.26	3.02 (1.49)	3.36 (1.49)	2.73 (1.42)	<.001	.43
<i>Humiliating sexual play</i>										
Total	1.73 (0.86)	1.88 (0.96)	1.62 (0.76)	<.001	.30	1.83 (0.99)	2.21 (1.17)	1.52 (0.69)	<.001	.72
Swears at me	1.75 (1.19)	1.99 (1.35)	1.59 (1.05)	<.001	.33	1.86 (1.28)	2.35 (1.49)	1.49 (0.95)	<.001	.69
Humiliates me	1.35 (0.88)	1.45 (0.99)	1.28 (0.80)	.011	.19	1.51 (1.08)	1.92 (1.37)	1.20 (0.64)	<.001	.67
Spits on me	1.32 (0.85)	1.47 (1)	1.19 (0.66)	<.001	.33	1.44 (0.99)	1.73 (1.23)	1.20 (0.66)	<.001	.54
Talks dirty to me	2.51 (1.47)	2.68 (1.53)	2.43 (1.41)	.042	.17	2.49 (1.47)	2.89 (1.54)	2.22 (1.36)	<.001	.46

The results indicated a significant main effect of the type of sexual play ( $F[1, 761] = 223.73, p < .001, \eta_p^2 = .227$ ), with aggressive sexual play to be preferred more than humiliating sexual play. Moreover, there was a significant main effect of sex ( $F[1, 761] = 58.5, p < .001, \eta_p^2 = .071$ ), with men indicating a stronger desire than women.

There was a significant interaction between the type of interest and sex ( $F[1, 761] = 12.84, p < .001, \eta_p^2 = .017$ ), where women gave similar scores for interest and fantasies, but men gave higher scores for interest than for fantasies. Moreover, there was a significant interaction between the type of interest and the target ( $F[1, 761] = 15.94, p < .001, \eta_p^2 = .021$ ). In particular, individuals gave similar scores for interest and for fantasies about performing aggressive and humiliating sexual play on others. They gave, however, higher scores for interest than for fantasizing about such play to be performed on self.

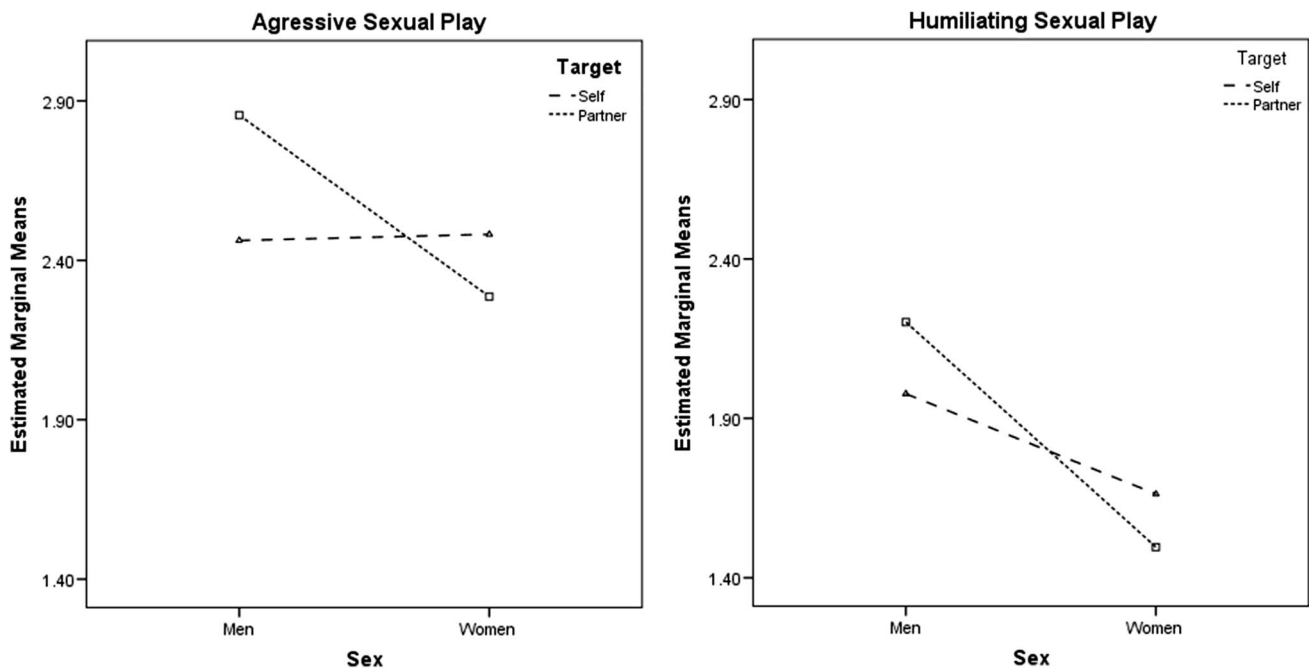
Finally, there was a significant three-way interaction between the target, sex, and the type of sexual play ( $F[1, 761] = 30.70, p < .001, \eta_p^2 = .039$ ), suggesting that the interaction between target and sex took different forms depending on the type of sexual play. This interaction can be seen in Fig. 1. When we moved from men to women, the desire for aggressive sexual play to be performed on self did not change, but for humiliating sexual play it declined. As a consequence, the interaction between target and sex was more pronounced for aggressive than for humiliating sexual play. Thus, the differences between what each sex desired to perform on a partner

and a partner to perform on self were more pronounced for aggressive sexual play than for humiliating sexual play.

### Discordance in the Interest for Aggressive and Humiliating Sexual Play

In Fig. 1, we can see also that there was discordance between the sexes, as men indicated a stronger desire for aggressive and humiliating sexual play to perform on partners than women would desire their partners to perform on them. Furthermore, the slopes of the lines indicated that men and women would disagree more over humiliating than over aggressive sexual play. In order to investigate the discordance further, we performed a MANOVA, where sexual play acts were entered as the dependent variables, and the discordance variable (two levels: women desire to be performed on self/men desire to perform on partner) was entered as the independent variable. We performed this analysis twice, once for aggressive sexual play and once for humiliating sexual play. The results are shown in Table 6.

Starting from aggressive sexual play, we can see that there was a significant discordance, with the overall effect size to be moderate. This difference was found for all acts with the exception of the “Looks at me aggressively,” where no significant sex difference was found. As indicated by the effect size, the strongest discordance was for the “Does things to me without asking” and for “Slaps me.” With respect to humiliating sexual play, a significant sex difference was also found,



**Fig. 1** The figures depict the three-way interaction between type of sexual play, target, and sex

with the effect size being moderate but larger than the effect size for aggressive sexual play. With respect to individual acts, as indicated by the effect sizes, the biggest discordance was for the “Humiliates me” act.

Furthermore, we would like to estimate the difference between the level of desire of men to perform such acts on partner and the level of women’s willingness to allow their partners to perform such acts on them. For this purpose, we performed a MANOVA, where the aggressive acts were entered as the dependent variables, and the effective discordance (two levels: women willing to allow a partner to perform on self/men desire to perform on partner) was entered as the independent variable. Such analysis was also performed for the humiliating sexual play. As can be seen from Table 6, with respect to aggressive sexual play, there was still significant discordance, but the effect size was about half as much as in the previous analysis, indicating a substantial decrease in discordance. Note also that, for several acts, no significant effect was found. With respect to humiliating sexual play, however, there was only a small reduction in the effect size.

In Fig. 1, we can see further that men indicated a stronger desire for aggressive and humiliating sexual play to be performed on them than women would desire to perform on their partners. In order to investigate this discordance, we performed a MANOVA, where sexual play acts were entered as the dependent variables and the discordance variable (two levels: men desire to be performed on self/women desire to perform on partner) was entered as the independent variable. With respect to aggressive sexual play, the result indicated

a significant small to moderate discordance (Table 6). As indicated by the effect size, the strongest discordance was for the “Does things to me without asking” and for “Hits me.” Finally, there was a significant large discordance with respect to humiliating sexual play. As indicated by the effect size, the discordance was the highest for the “Talks dirty to me.”

## Discussion

The results of the current research indicated that the desire for aggressive and humiliating sexual play was high, with more than 70% of participants exhibiting a desire for at least one aggressive or humiliating sexual act, and about half of the participants exhibiting a desire for at least three acts. Aggressive sexual play was desired more than humiliating sexual play, while there was variation in the desire for each act in each category, with some acts being desired more than others. In addition, there was discordance between men and women, with men desiring to engage in aggressive and humiliating sexual play more than women. Effective discordance was likely to be lower, however, as women were willing to allow their partners to perform on them aggressive and humiliating sexual acts in order to satisfy them.

With respect to the observed sex differences, given the large sample size, even small differences would be significant, so the effect sizes can give us a better picture of how extensively the two sexes differed in each dimension. With respect to aggressive sexual play to be performed on partner,

**Table 6** Disagreement between the sexes over the desire for aggressive and humiliating sexual play

	Men on partner		Women on self		Men on partner		Women allow on self		Women on partner		Men on self	
	M. (SD)	M. (SD)	p value	d	M. (SD)	M. (SD)	p value	d	M. (SD)	M. (SD)	p value	d
<i>Aggressive sexual play</i>												
Overall	2.92 (0.89)	2.52 (0.89)	< .001	.45	2.92 (0.89)	2.71 (1.07)	< .001	.21	2.31 (0.84)	2.59 (0.89)	< .001	.32
Ties me	2.85 (1.43)	2.34 (1.24)	< .001	.38	2.85 (1.43)	2.86 (1.45)	.596	.00	2.31 (1.32)	2.47 (1.34)	.163	.12
Handcuffs me	2.79 (1.49)	2.34 (1.24)	< .001	.33	2.79 (1.49)	2.85 (1.47)	.200	.04	2.30 (1.29)	2.5 (1.37)	.077	.15
Pulls my hair	3.28 (1.37)	2.90 (1.31)	.001	.28	3.28 (1.37)	3.02 (1.46)	.044	.18	2.47 (1.34)	2.42 (1.3)	.258	.04
Bites me	3.13 (1.33)	2.88 (1.2)	.010	.20	3.13 (1.33)	2.93 (1.42)	.064	.14	2.94 (1.33)	3.05 (1.29)	.562	.08
Slaps me	2.73 (1.46)	2.09 (1.25)	< .001	.47	2.73 (1.46)	2.11 (1.33)	< .001	.44	1.58 (0.99)	2.05 (1.22)	< .001	.42
Treats me aggressively	2.86 (1.42)	2.47 (1.27)	< .001	.29	2.86 (1.42)	2.56 (1.46)	.003	.21	2.14 (1.24)	2.61 (1.32)	< .001	.37
Looks at me aggressively	2.95 (1.44)	2.92 (1.42)	.843	.02	2.95 (1.44)	3.17 (1.49)	.009	.15	2.61 (1.4)	3.06 (1.43)	< .001	.32
Hits me	2.38 (1.38)	1.95 (1.18)	< .001	.33	2.38 (1.38)	1.89 (1.25)	< .001	.37	1.46 (0.86)	1.91 (1.15)	< .001	.44
Does things to me without asking	3.54 (1.31)	2.81 (1.35)	< .001	.55	3.54 (1.31)	2.96 (1.42)	< .001	.42	2.88 (1.39)	3.48 (1.27)	< .001	.45
<i>Humiliating sexual play</i>												
Total	2.22 (1.12)	1.69 (0.64)	< .001	.58	2.22 (1.12)	1.80 (0.82)	< .001	.43	1.46 (0.56)	2.11 (0.9)	< .001	.87
Swears at me	2.31 (1.46)	1.62 (0.98)	< .001	.55	2.31 (1.46)	1.80 (1.21)	< .001	.38	1.34 (0.74)	2.16 (1.3)	< .001	.77
Humiliates me	1.83 (1.31)	1.25 (0.67)	< .001	.56	1.83 (1.31)	1.32 (0.79)	< .001	.47	1.13 (0.51)	1.51 (1)	< .001	.48
Spits on me	1.71 (1.24)	1.18 (0.59)	< .001	.54	1.71 (1.24)	1.28 (0.76)	< .001	.42	1.14 (0.52)	1.50 (1)	< .001	.45
Talks dirty to me	3.06 (1.48)	2.68 (1.28)	< .001	.27	3.06 (1.48)	2.77 (1.47)	.002	.20	2.25 (1.28)	3.28 (1.37)	< .001	.78

the effect size was large, with men preferring it considerably more than women. On the other hand, for the aggressive sexual play to be performed on self, the small effect size connoted substantial overlap in desire between the two sexes. Moving on to the humiliating sexual play to be performed on partner, the effect size indicated a considerable difference, with men preferring it much more than women. With respect to humiliating sexual play to be performed on self, men preferred it also more than women, but as indicated by the effect size, the sex difference was moderate. Similar patterns were found for sexual fantasies. Overall, men preferred more than women to engage in aggressive and humiliating sexual play, but the difference was considerably more pronounced over performing it on partner than over performing it on self.

The occurrence rates found here were much higher than the rates found in other studies, which did not measure desires for individual acts, and they also examined desires for aggressive and humiliating sexual play as a paraphilia (e.g., Dawson et al., 2016; Joyal & Carpentier, 2017). Our theoretical framework, combined with these high occurrence rates, suggests that aggressive and humiliating sexual play constitutes a normal and not a deviant expression of human sexuality. It needs to be said, nevertheless, that if desires for aggressive and humiliating sexual acts become rigid and extreme, resulting in physical harm, or preventing an individual to have satisfactory sexual intercourse without engaging in such play, a diagnosis of paraphilic disorder may apply (American Psychiatric Association, 2013).

Our findings indicate further that this kind of sexual play can be a potential source of discordance in couples. Men would desire to engage in aggressive and humiliating sexual play more than their opposite-sex partners would like. The mismatch in desires may not necessarily escalate to substantial discordance, given that individuals exhibited a willingness to allow their partners to perform aggressive and humiliating sexual acts on them in order to satisfy them. We would also expect this discordance to be reduced further, since individuals would be similarly willing to perform such acts on their partner even if they do not prefer to do so, in order to provide them satisfaction. Future studies need to examine whether this is the case.

The present study has attempted to place the preference for aggressive and humiliating sexual play in an evolutionary framework. It has been argued that male desires for aggressive and humiliating sexual play have been shaped by selection forces in ancestral pre-industrial times, to enable men to bypass female choice and place female sexuality under control. As such dispositions do not serve the interests of women, they would not find them as desirable as men, but they would find them to some degree desirable in order to reduce conflict with their partners. It needs to be said that there is no paradox in the argument that women have evolved desires to accommodate the desires of their partners, which have evolved in

the first place to promote the interests of men against the interests of women. More specifically, it appears as if we are saying that women have evolved desires to accommodate the desires of their partners, the latter being fitness-decreasing for women. But it needs to be considered that by accommodating their partners' desires, women increase rather than decrease their fitness. To state it differently, although these male desires are fitness-decreasing for women, the latter detesting them would be even more fitness-decreasing for them.

In this framework, these desires are interpreted as innate dispositions, but such dispositions are also likely to be responsive to environmental conditions. More specifically, in a conservative social context, individuals may be less likely to express and act on such desires than in a less conservative social context. Also, social phenomena such as the high popularity of literature works (e.g., *Fifty Shades of Gray*), can turn people more open to sexual play of this kind (Altenburger, Carotta, Bonomi, & Snyder, 2017; Peter & Valkenburg, 2006). Moreover, the presence of individual rights protection systems are likely to affect the degree that individuals act on their desires irrespectively of their partners' will. For instance, in a pre-industrial context, where individual rights are not well protected, men have more freedom to act on their preferences, but such freedom is much more limited in a post-industrial context.

One advantage of this research is that it was online, which gives privacy to individuals who are more likely to give honest answers, especially for a sensitive subject (Kreuter et al., 2008; Link & Mokdad, 2005). On the other hand, the sample obtained by this method was not representative of the population. In particular, people who are younger, more educated, and more open-minded are likely to be overrepresented (Ross, Månsson, Daneback, Cooper, & Tikkanen, 2005). Also, individuals who agree to participate in sex studies are more open and more sexually experienced than non-respondents (Bogaert, 1996; Wiederman, 1999). These biases would tend to inflate the occurrence rates of aggressive and humiliating sexual play. Furthermore, this is a self-report study and, given its nature, individuals may not be willing to admit that they have desires for aggressive and humiliating sexual play which would deflate the occurrence rates.

In addition, part of the observed sex differences in desire for aggressive and humiliating sexual play may be due to a greater willingness of men to acknowledge sexual interest and fantasy. Accordingly, future research needs to control for such an effect in order to estimate more accurately the sex differences arising from evolved predispositions. Also, our instrument was developed on the basis of qualitative research on the acts that people indicated as aggressive and humiliating. Even so, not all participants in our sample may have interpreted these acts in this way. For instance, "Does things to me without asking" can be interpreted as

an aggressive act because it bypasses the consent of the recipient. Yet, some participants might endorse this act because they interpreted it to involve their partner kissing or caressing them without asking first, actions which are usually not considered as aggressive. Similarly, for “Talks dirty to me,” some dirty talking may not be interpreted as humiliating for the recipient (e.g., “you have a beautiful pussy”). Overall, some participants may not have considered certain acts as aggressive and humiliating which may have inflated their willingness to report them as desirable.

Moreover, some participants may lack experience and may not have adequately explored their sexuality, so they may actually have had such preferences without being aware of it. The reverse may happen as well, since people may have thought that such play was entertaining, without, however, having engaged in it, and if they do so they may change their minds. Future research can potentially control for such effects by measuring how sexual experienced participants are. Furthermore, in constructing the instrument of our study, we did not include items which participants reported infrequently as desirable. Future research can construct a more comprehensive instrument for measuring desires for aggressive and humiliating sexual play. Last but not least, the present research is confined to a single culture; as cultural factors are likely to affect the occurrence rates, our findings may not readily apply to different cultures. Future studies need to replicate these findings in different cultural settings.

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