Sex Differences in the Motivation for Viewing Sexually Arousing Images

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Abstract

Sexual motivation strongly influences our mate choices and dating behaviors and can be triggered by merely viewing sexually arousing visual images, such as erotic pictures and movies. Previous studies suggested that men, more than women, tend to search for sexual cues that signal promiscuity in short-term mates. However, it remains to be tested whether the sex differences in the motivation to view sexual cues can be observed by using robust and well-controlled behavioral measures. To this end, we employed a pay-per-view key-pressing task. Japanese self-identified heterosexual male and female participants viewed images of men, women, or couples with two levels of sexual arousal (sexual vs. less sexual). Participants could alter the viewing time of a presented image according to their willingness to keep viewing it. The male participants were eager to view the sexual female images the most, whereas the female participants were more strongly motivated to view the less sexual images of couples. Such sex differences may reflect differentiated reproductive strategies between men and women; men's motivation toward promiscuity and women's motivation toward long-term relationships.

Keywords: sexual motivation, sex differences, sexual strategies theory, mate selection, pay-per-view key-pressing task

1. Introduction

Sexual motivation has substantial impacts on our mate choice and dating behaviors and is therefore central to an understanding of human evolution (Fisher, Aron, & Brown, 2006). From an evolutionary psychology perspective, men and women should be equipped with specialized psychological adaptations for mate choice, which lead to sex-differentiated reproductive strategies (Buss & Schmitt, 1993). These differentiated strategies may also be reflected in the responsiveness to sexual visual cues. Indeed, previous sexuality research indicates sex differences in psychological reactions to visual sexual cues (e.g., Baumeister, Catanese, & Vohs, 2004; Peplau, 2003). One eye-tracking study revealed that men and women exhibit different viewing patterns when looking at sexual images, specifically, men focus more on female faces, and women focus more on background information (Rupp & Wallen, 2007). Behind the gender differences in response to visual sexual cues, men were more likely to report greater interest than women in seeking short-term mates and to consent to have sex after briefer periods of time across cultures (Dawson & Chivers, 2016; but see also Schmitt et al., 2003). In contrast, women are more selective in choosing short-term mates and have stricter criteria for a mate's physical attractiveness (Kenrick, Groth, Trost, & Sadalla, 1993).

The sexual strategies theory (SST; Buss & Schmitt, 1993) provides a plausible explanation for the sex differences in psychological reactions to visual sexual stimuli. The

SST posits that sex differences in mate preferences and mating decisions result from different mating problems that men and women have faced (Buss & Schmitt, 1993). According to the SST, humans possess psychological adaptations designed for both short-term and long-term mating strategies. Short-term mating strategies are characterized by a desire for sexual variety and multiple sex partners over brief time intervals (Schmitt, 2015). Long-term mating strategies are characterized by monogamous relationships and long-term pair bonding (Buss & Schmitt, 1993). For reproductive success, both men and women have to devote their parental investment to their offspring in order to increase the survival chances of their offspring, but the minimal parental investment requirements differ between men and women (Trivers, 1972). In terms of human reproduction, females tend to be the more heavily investing sex, as is the case for most mammals (e.g., fertilization, gestation, and placentation) because women are constrained by the number of offspring they can produce. Thus, pursuing short-term mating strategies is thought to be more advantageous for men than for women in terms of reproduction and genetic dissemination. Men's reproductive success accrues from obtaining sexual access to a larger number of female partners, which may in part explain why men are sexually aroused more easily than women (Baumeister, Catanese, & Vohs, 2001; Peplau, 2003). In contrast, pursuing long-term mating strategies is thought to help foster and maintain long-term pair-bonding, enabling high levels of investment and commitment to one's offspring. Thus, women often pursue long-term mating strategies to secure the quantity

and quality of external resources for themselves and their offspring from men (e.g., good earning capacity, wealth, and so on; see Buss & Schmitt, 1993 for more details).

Such sex differences in mating strategies are also reflected in the psychological reactions to sexual cues. In general, men are more eager than women to access visual sexual cues (Baumeister et al., 2004; Buss & Schmitt, 1993; Schmitt, 2014). The core brain regions for sexual desire, including the amygdala and hypothalamus, are more strongly activated in men than women when viewing identical sexual images (Hamann, Herman, Nolan, & Wallen, 2004). Furthermore, men's stronger preference for sexual visual cues can lead to greater motivation to view sexually arousing images (Murnen & Stockton, 1997), perhaps because such visual images are cues for sexual gratification from the actual act (Kimmel & Plante, 2002; Zurbriggen & Yost, 2004). One survey revealed that 46% of the American male population accesses pornography at least once a week, compared to only 16% of the American female population (Regnerus, Gordon, & Price, 2016). Also, men prefer to watch explicit pornography (Hald, 2006) and are willing to pay for pornography and prostitution (Pitts, Smith, Grierson, O'Brien, & Misson, 2004; Regnerus et al., 2016). Conversely, women are likely to experience higher levels of subjective sexual arousal when fantasizing about romantic relationships (Carvalho et al., 2013). Laan, Everaerd, van Bellen, & Hanewald (1994) pointed out that women feel more intense subjective sexual arousal for women-made pornography, while they often experience negative affective reactions toward man-made

pornography and describe such content as awful and unaesthetic. Women-made pornography delineates romantic elements more (e.g., glancing at each other or kissing) as well as sexual intercourse, while man-made pornography is less focused on romantic details (Laan et al., 1994). Furthermore, women experience higher levels of subjective sexual arousal when exposed to sexual content in films, especially when they fantasize about their partner (Carvalho et al., 2013). These findings indicate that romantic elements (e.g., marriage, intimate couples) are essential for female subjective sexual arousal, possibly reflecting stronger preferences for long-term relationships and long-term pair-bonding (Chivers & Timmers, 2012). It is of note that women's preferences for romantic elements are reflected in subjective sexual arousal but not in physiological arousal as indexed by genital responses (Carvalho et al., 2013; Laan et al., 1994). Taken together, these findings suggest that men generally tend to search for sexual cues that signal immediate sexual access and promiscuity in short-term mates as opposed to women, who seek long-term relationships (Buss & Schmitt, 1993).

Despite accumulating evidence on the sex differences in response to visual sexual cues using self-report surveys, few studies have demonstrated the sex differences in responsiveness to sexual cues by using behavioral measurements. To quantify sex differences in willingness to view visual sexual cues, we adopted a pay-per-view key-pressing task (Aharon et al., 2001). The pay-per-view task constitutes an effort-based behavioral

measurement of willingness to view a given stimulus as indexed by the number of key presses (Sprengelmeyer, Lewis, Hahn, & Perrett, 2013). Participants are able to alter the viewing time of a presented picture according to their willingness to view the picture by pressing a predetermined key to increase the viewing time of images if they are willing to watch the images for longer. In contrast, participants press an alternate key to decrease the viewing time. According to an earlier study using the pay-per-view task (Aharon et al., 2001), the key-press task is assumed to reflect the psychologically rewarding value of viewing visual images, rather than the subjective likability of the images. The task provides a quantitative indication of whether or not the behavior is actually affected, which in turn provides a more accurate representation of our daily behavior (Ferrey, Frischen, & Fenske, 2012). Indeed, Aharon et al. (2001) reported that men and women's attractiveness rating scores of opposite-sex faces were comparable in a self-report measurement, but men, more than women, spent more time viewing attractive faces of the opposite sex. Similarly, Hahn, Xiao, Sprengelmeyer, and Perrett (2013) replicated the finding that men are eager to look longer at attractive faces of the opposite sex than women were willing to look. Thus, we expected that the pay-per-view key-pressing task would provide a valid behavioral measurement for the motivation to view sexual images.

The present study aimed to investigate sex differences in the motivation to view several types of sexual images by using the pay-per-view key-press task. Based on the sexual

strategies theory, we predicted that both heterosexual men and women would increase their viewing time of opposite-sex images compared to same-sex images because opposite-sex images are associated with reproduction, copulation, and personal bonds (Carvalho et al., 2013; Chivers & Bailey, 2005; Hahn et al., 2013; Laan et al., 1994). In addition, we anticipated that men would be more eager than women to view sexual images, such as opposite-sex nude images because sexually explicit opposite-sex images suggest sexual accessibility (i.e., looseness or promiscuity), which can provide direct benefits for men seeking short-term relationships. In contrast, women would be less likely to view sexually explicit images because women are expected to be relatively selective and discriminating when choosing a sexual partner, in keeping with their preference for long-term strategies. In addition, long-term strategies may enhance the motivation for women to view images of couples because they imply emotional and romantic bonding. We tested a set of hypotheses by presenting three types of images (i.e., males, females, and couples). Some previous studies used sexual images depicting only a nude man or a nude woman (Morrison, Wang, Hahn, Jones, & DeBruine, 2017; Ponseti & Bosinski, 2010), while others employed images of opposite-sex couples depicting relationship contexts or physical contact (Dewitte, 2015; Hamann et al., 2004; Laan et al., 1994; Spiering et al., 2010). We included images of couples in this study because images of couples evoking romantic emotions would be essential for

women's sexual interest (Laan et al., 1994; Rupp & Wallen, 2007) and women are more sensitive to contextual and nonsexual details of sexual stimuli than are men.

2. Methods

2.1 Participants

Thirty-one Japanese men ($M_{age} = 20.43$ years, $SD = 1.81$ years) and 27 Japanese women ($M_{age} = 19.96$ years, $SD = 1.53$ years) were recruited for this experiment. All participants self-identified as heterosexual, had normal or corrected-to-normal vision, and were naive to the purpose of the study. They provided written informed consent before participating and were individually tested. This study was approved by the local ethics committee of the university with which the authors are affiliated. The sample size was determined based on a previous study examining the gender differences in affective responses to visual sexual cues (Carvalho et al., 2013).

2.2 Apparatus and Stimuli

The experimental stimuli were a set of 36 colored images selected from the NAPS ERO (Wierzbica et al., 2015) and OASIS (Kurdi, Lozano, & Banaji, 2017) image databases. From the NAPS ERO, images of opposite-sex couples ($N = 5$, male and female explicitly engaged in sexual intercourse or sexual interaction), a single male ($N = 6$), and a single female ($N = 5$, individuals engaged in an erotic or sexual setting) were selected. Some images from the OASIS were also selected from couple ($N = 5$), nude couple ($N = 2$), nude male ($N = 6$), and nude female categories ($N = 7$). The images were selected according to the mean rating score of sexuality and arousal provided by 34 heterosexual Japanese participants (18 females; $M_{age} = 20.94$, $SD = 1.71$) in a preliminary experiment. Participants in the

preliminary experiment rated the sexuality and emotional arousal of the 231 images collected from the NAPS ERO and OASIS on a scale ranging from 1 (not sexual at all/not emotionally arousing at all) to 9 (highly sexual/highly emotionally arousing). Inter-rater reliabilities of the rating scores were high (Cronbach's alphas $> .95$), and thus the two rating scores were averaged across participants for each. As the sexuality and emotional arousal ratings were highly interrelated ($r = .92$), the two ratings were synthesized via a principal component analysis (PCA); thus, the synthesized score (referred to as "sexual arousal") accounted for 83.7 % of the variance. Then, we selected 18 low sexual arousal (referred to as "less sexual") and 18 high sexual arousal image stimuli (referred to as "sexual") according to the sexual arousal scores (Figure 1). Each image set consisted of pictures depicting a single male ($N = 6$, sexual; mean rating score = 0.69, $SD = 0.66$, less sexual; mean rating score = -2.07, $SD = 0.11$), a single female ($N = 6$, sexual; mean rating score = 2.57, $SD = 0.46$, less sexual; mean rating score = -0.19, $SD = 0.37$), and a male-female couple ($N = 6$, sexual; mean rating score = 2.13, $SD = 0.52$, less sexual; mean rating score = -2.64, $SD = 0.44$). The selection of images was validated by statistical tests in advance. An ANOVA on the sexual arousal scores revealed a significant main effect of photo category [$F(1.36, 6.78) = 570.21, \eta^2_p = .99, p < .001$] and of sexual arousal [$F(1, 5) = 712.24, \eta^2_p = .99, p < .001$]. There were significant interactions between photo category and sexual arousal [$F(1.68, 8.42) = 65.12, \eta^2_p = .93, p < .001$]. A simple main effects analysis and subsequent multiple comparison tests (Shaffer's modified sequentially rejective Bonferroni method) revealed that all the images were rated higher in the sexual condition than the less sexual condition [male images: $F(1, 5) = 117.21, \eta^2_p = .96, p < .001$, female images: $F(1, 5) = 555.60, \eta^2_p = .99, p < .001$, couple images: $F(1, 5) = 1901.62, \eta^2_p = 1.00, p < .001$]. Furthermore, in both the sexual and less sexual conditions, the sexual arousal score was the highest for the female images, followed in order by the couple images and male images ($ps < .05$).

2.3 Procedure

The experiment consisted of a pay-per-view key-pressing task and a subjective rating task. Upon arriving at the experimental room, participants were taken to a dark room designed for visual experiments and were seated in front of a computer display. All of the participants received a short briefing explaining that sexually explicit images would be presented in the experiment and that they could quit the task if they felt uncomfortable. The participants took part in the task only if they agreed to the above-mentioned explanation.

2.3.1 Pay-per-view key-pressing task. Participants were then asked to complete the pay-per-view key-pressing task. In the task, participants were able to alter the viewing time of a presented picture according to their willingness to view it. We measured the average number of key presses in the pay-per-view task for the analysis. Each trial began with the presentation of a fixation point for 500 ms, followed by a target picture presentation. The default presentation time was 4000 ms, and participants could either increase the viewing time by alternating between the “N” and “M” keys or decrease the viewing time by alternating between the “Z” and “X” keys. A vertical timer-bar appeared next to each image to indicate the remaining time before image progression. One key-press unit was coded each time a key-pair was pressed alternately. In each trial, a randomly selected picture was presented once; 36 trials were conducted in total. All participants completed a brief training task designed to familiarize them with the key-press procedure prior to the experiment by using sample pictures never presented in the main task.

2.3.2 Subjective rating task. After completing the pay-per-view key-pressing task, participants were asked to provide ratings for arousal (1: not arousing at all, 9: highly arousing) and likability (1: dislike, 9: very like) for all 36 images presented in the pay-per-view key-pressing task by using a nine-point Likert scale. The presentation order of the

images was randomized, and the order of the rating types was counterbalanced across participants.

2.4 Data Analysis

Data from one male and two female participants were excluded from the analysis because the total number of their total key-presses in the pay-per-view task was less than 55.6 times (i.e., less than the 5th percentile of the total number of the key presses); then, the final analysis included the data for 55 participants (25 female). The motivation in the pay-per-view task and the two types of rating scores (likability and arousal) were analyzed with a three-way mixed ANOVA with photo category (male vs. female vs. couple) and sexual arousal (sexual vs. less sexual) as within-participant factors and participants' sex (male vs. female) as a between-participant factor. A Greenhouse-Geisser correction was applied when Mendoza's multisample sphericity test indicated violations of the assumption of sphericity. We reported the number of key-presses in the pay-per-view task in the following Results section, and the likability and sexuality ratings in the supplemental information (Figure S1 and S2).

3. Results

3.1 Pay-Per-View Key-Pressing Task

Figure 2 shows the results of the key-pressing task. An ANOVA on the average number of key presses revealed a significant main effect of photo category [$F(1.72, 91.21) = 21.92, \eta_p^2 = .29, p < .001$] and sexual arousal [$F(1, 53) = 20.52, \eta_p^2 = .28, p < .001$] but not of participant sex [$F(1, 53) = 1.94, \eta_p^2 = .04, p = .17$]. There were significant interactions between photo category and participant sex [$F(1.72, 91.21) = 11.82, \eta_p^2 = .18, p < .001$],

between photo category and sexual arousal [$F(1.73, 91.82) = 8.01, \eta_p^2 = .13, p < .01$], and between sexual arousal and participant sex [$F(1, 53) = 28.58, \eta_p^2 = .35, p < .001$]. The three-way interaction was also significant [$F(1.73, 91.82) = 5.96, \eta_p^2 = .10, p < 0.01$].

To identify the source of the three-way interaction, we performed two-way ANOVAs separately for male and female participants. For the male participants, the results revealed a significant main effect of photo category [$F(1.52, 44.2) = 19.75, \eta_p^2 = .41, p < .001$] but not of sexual arousal [$F(1, 29) = 0.47, \eta_p^2 = .02, p = 0.50$]. The two-way interaction was also significant [$F(1.48, 42.78) = 4.26, \eta_p^2 = .13, p < .05$]. A simple main effects analysis and subsequent multiple comparison tests (Shaffer's modified sequentially rejective Bonferroni method) revealed that in the sexual condition, the number of key presses was the largest for the female images, followed in order by the couple images and male images ($ps < .05$). In the less sexual condition, the number of key presses was larger for both the female and couple images than for male images ($ps < .001$), but the number of keypresses did not differ between the female and couple images ($p = .64$). The male images were viewed longer in the less sexual condition than in the sexual condition [$F(1, 29) = 4.85, \eta_p^2 = .14, p < .05$], but such differences were not observed for the couple images [$F(1, 29) = 0.36, \eta_p^2 = .01, p = .55$]. In addition, the tendency to view the female images longer in the sexual condition compared to the less sexual condition fell just short of significant [$F(1, 29) = 3.53, \eta_p^2 = .11, p = .07$].

For the female participants, the results revealed significant main effects of both photo category [$F(1.38, 33.17) = 16.55, \eta_p^2 = 0.41, p < .001$] and sexual arousal [$F(1, 24) = 35.21, \eta_p^2 = 0.59, p < .001$]. The two-way interaction was also significant [$F(1.39, 33.38) = 14.27, \eta_p^2 = 0.37, p < .001$]. A simple main effects analysis and subsequent multiple comparison tests revealed that in the sexual condition, no significant main effect of photo category was observed [$F(1.57, 37.72) = 1.70, \eta_p^2 = 0.07, p = .20$]. In the less sexual condition, the number of key presses was the longest for the couple images, followed in order by the female images and male images ($ps < .05$). All three image categories were viewed longer in the less sexual condition than in the sexual condition [male images: $F(1, 24) = 26.81, \eta_p^2 = 0.53, p < .001$; female images: $F(1, 24) = 33.28, \eta_p^2 = 0.58, p < .001$; couple images: $F(1, 24) = 29.28, \eta_p^2 = 0.55, p < .001$].

4. Discussion

The present study aimed to examine sex differences in the motivation to view sexual images by employing the pay-per-view key-pressing task. Drawing on the sexual strategies theory (SST, Buss & Schmitt, 1993), we hypothesized that our self-identified heterosexual male and female participants would view the opposite-sex images longer than the same-sex images because opposite-sex images can evoke sexual arousal (Chivers & Bailey, 2005; Hahn et al., 2013), and that men would be more eager than women to view the highly sexual

images because sexually explicit opposite-sex images suggest sexual accessibility (Buss & Schmitt, 1993). Our results indicate that the motivational salience of sexual images differed between male and female participants. Here, we summarize the main findings and interpret such differences in light of the SST (Buss & Schmitt, 1993).

First, as predicted, our male participants viewed the female and couple images longer than the male images, irrespective of the sexual arousal of the images. These results confirm that heterosexual males are strongly motivated to view female images (Baumeister et al., 2004; Hamann et al., 2004). Furthermore, the number of key-presses by the male participants for the female images was higher compared to that for the couple images in the sexual condition but not in the less sexual condition. Also, there was a marginally significant tendency that the males' viewing time of the female images was generally prolonged in the sexual condition compared to the less sexual condition. Such prioritized motivational responses to the female images were not evident in the likability or sexual arousal ratings (see Supplementary Figure S1 and S2). This suggests that the pay-per-view responses reflect sexual motivation to view the images, not merely the subjective evaluations of them. These observations of the male participants' behavior are consistent with the behavioral predictions provided by the SST (i.e., prediction 6: *Cues to immediately available sex will be valued by men in short-term mates more than in long-term mates because they provide cues to sexual accessibility*). Previous studies also suggest that men are likely to prefer visual sexual cues

than women, and are thus eager to view nude images of women (Baumeister et al., 2004; Regnerus et al., 2016). Also, recent studies reveal that heterosexual men prefer to view opposite-sex images in both erotic and non-erotic contexts more than heterosexual women do (Lykins, Meana, & Kambe, 2006; Lykins, Meana, & Strauss, 2008; Rupp & Wallen, 2007). Taken together, these findings suggest that men tend to value cues to immediately available sex (e.g., promiscuity) in short-term mates (Buss & Schmitt, 1993), possibly leading to men's greater attraction to sexually arousing visual images. Our results support these previous findings by using a behavioral measurement that reflects sexual motivation.

In contrast to the male participants, the female participants displayed different patterns of pay-per-view responses depending on the sexual arousal of the images. From the standpoint of mate choice, the female participants would have also viewed the male images longer than the female images (Chivers & Bailey, 2005; Hahn et al., 2013). However, the female participants in this experiment viewed the couple images longer than the male and female images in the less sexual condition, while they decreased the viewing time for all types of images in the sexual condition. The results that our female participants reduced the viewing time of the male images in both the sexual and less sexual conditions were unexpected. Previous studies indicate that women react to men's physical attractiveness as strongly as men react to women's physical attractiveness (Hahn et al., 2013; Hamann et al., 2004; Wiederman & Dubois, 1998). This indicates that men and women are equally able

to identify sexual cues from the opposite sex (Kowalski, 1993). It is noteworthy that many previous findings were based on participants from Western cultures; so, the inconsistency between previous findings and our results may be partially derived from cultural and social differences in sexual attitudes (Thomas, Yarandi, Dalmida, Frados, & Klienert, 2015). Indeed, it is often reported that East-Asian, including Japanese, women report lower sexual desire than Caucasian women (Brotto, Chik, Ryder, Gorzalka, & Seal, 2005; Cain et al., 2003). It is possible that social norms regarding sexual behaviors held by East-Asian women may affect the pay-per-view responses (Woo, Brotto, & Gorzalka, 2011). It would be interesting to address this question by conducting a cross-cultural study with East-Asian and Western populations.

Of particular interest is that our female participants viewed the couple images longer than the male and female images in the less sexual condition. Such patterns were also observed in the subjective likeability rating task (see Supplementary Figure S1). These results are consistent with previous findings that women are highly motivated to view couple images depicting relationship contexts and emotional bonds (Laan et al. 1994, Carvalho, 2013). According to the behavioral prediction of the sexual strategies theory, women place more emphasis on romantic relationships than men's physical attractiveness (Rupp & Wallen, 2007). Indeed, Dewitte (2015) showed that women feel greater sexual desire when primed with visual cues conjuring up romantic relationships. Correspondingly, women experience

more intense sexual arousal when viewing pornography with romantic elements (e.g., glancing at each other, kissing, or marriage) than pornography with actual sexual intercourse (Laan et al., 1994). In our study, the female participants displayed prolonged viewing of less sexual couple images compared to the highly sexual couple images. The less sexual couple images often include romantic elements as described above. The female preference for romantic or relational elements likely derives from psychological adaptations for long-term relationship and pair-bonding signals (Buss & Schmitt, 1993; Chivers & Timmers, 2012). Long-term relationships are more advantageous for women than for men (Trivers, 1972), because women tend to be the more heavily investing sex (e.g., fertilization, gestation, placentation, and maternal care). Thus, women's strong preference for long-term mating cues might reflect the motivation to secure the quantity and quality of external resources for themselves and their offspring from men (Buss & Schmitt, 1993). At the same time, our female participants made key-press responses to reduce the viewing time for images with high sexual arousal (sexual condition), regardless of the image category. This response pattern may be related to an adaptive behavior such as preventing the initiation of sexual intercourse after only brief intervals of time (Buss & Schmitt, 1993) and/or the social norms regarding sexual behaviors held by East-Asian women.

4.1 Limitations and Directions for Future Research

While the findings of the current study are novel, there exist several limitations to be considered. For example, the visual stimuli we used were limited to images from Caucasian models, while the participants in this study were Japanese. Some studies demonstrate that people are susceptible to recognition errors or biased emotional evaluation when target images are from an unfamiliar group rather than their own group (e.g., other-race-effect; (Feng, Wang, Wang, Gu, & Luo, 2012; Herrmann et al., 2007; Hugenberg, Young, Bernstein, & Sacco, 2010). Although we confirmed in the preliminary experiment that Japanese viewers were able to evaluate sexual arousal consistently, it may be more appropriate to use sexually arousing images from the same cultural group. However, to the best of our knowledge, the image database including a Japanese erotic category is not publicly available yet. Our findings await validation from future studies by using images from the same and different groups. Second, we could not rule out the possibility that unidentified factors other than sexual arousal and the image categories of our image stimuli affected the viewing time in the pay-per-view task because of the lack of experimental control for the components constituting each image, such as the presence of faces, the number of persons, and so on. More detailed analysis is needed for a deeper understanding of what triggers the sex differences in the motivation to view sexual images.

4.2 Conclusions

In conclusion, the present study investigated sex differences in willingness to view sexual images by using the pay-per-view task. Our Japanese male participants were motivated to view sexually arousing female images, whereas female participants were motivated to view less sexually arousing couple images. Such sex differences may reflect differentiated reproductive strategies between men and women, as predicted by the sexual strategies theory. The sex differences based on psychological adaptation may help solve our dating problems and sexual harassment problems. Our findings contribute to a better understanding of differentiated sexual motivation between men and women, which underlies a wide range of sex-related social matters including pornography consumption, sexual consent, and sexual crimes.

Compliance with Ethical Standards

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Data Availability: The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and

were approved by the local ethics committee of the university that the authors are affiliated with. All procedures were carried out in accordance with the 1964 Helsinki declaration and its later amendments.

Informed consent: Informed consent was obtained from all individual participants included in the studies. Before starting the experiment, each participant in all studies provided informed consent and signed a written consent form.

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Figure legends

Figure 1. Stimuli samples of men (top), women (middle), and couple (bottom) images. The stimuli to the right and left were for the sexual condition and less sexual condition, respectively.

Figure 2. Average number of key presses in the pay-per-view task. The data for male participants are presented in the left panel and for female participants are presented in the right panel. Error bars present standard errors (SEs) of the mean. The solid and dashed lines placed at the top of the figure indicate the level of significance.