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With our Without You: Associations Between Frequency of Internet Pornography Use and   
Sexual Relationship Outcomes for (Non)Consensual (Non)Monogamous Individuals

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## Abstract

More frequent internet pornography use is often associated with decreased sexual satisfaction. However, individuals who use internet pornography more often can experience better relationship outcomes, depending on how they use it in the context of their relationship. Indeed, internet pornography use with the partner seems to be positively associated with sexual satisfaction. We explored whether the type of agreement partners have about monogamy is related to this association. We conducted a cross-sectional study ( $N = 866$ ; 66.3% women,  $M_{\text{age}} = 27.40$ ,  $SD = 8.58$ ) with individuals in monogamous ( $n = 552$ ), non-consensual non-monogamous (NCNM;  $n = 210$ ) and consensually non-monogamous (CNM;  $n = 104$ ) relationships. Results showed that CNM individuals used internet pornography substantially more than the other two groups, but they were as sexually satisfied with themselves and with their primary partner as monogamous individuals. NCNM individuals were the least sexually satisfied and reported more sexual arousal difficulties than the other groups. Results further showed that CNM individuals included their primary partner in their internet pornography use more frequently than the other groups, and this inclusion was positively associated with sexual satisfaction with the primary partner. The frequency of internet pornography use with the partner was negatively associated with sexual arousal difficulties for monogamous individuals, and positively associated with personal and relational sexual satisfaction in both monogamous and NCNM individuals. These results complement past findings by shedding light on the role of internet pornography use for different relationship agreements, and its association with personal and relational experiences.

**Keywords:** Internet pornography; sexual satisfaction; relationship agreements; monogamy; consensual non-monogamy

## With our Without You: Associations Between Frequency of Internet Pornography Use and Sexual Relationship Outcomes for (Non)Consensual (Non)Monogamous Individuals

Pornography refers to any type of sexually explicit media depicting nudity or explicit sexual behavior produced to increase sexual arousal in its viewers (Campbell & Kohut, 2017; Carroll et al., 2008). Pornography use has been increasing in recent years (Price et al., 2016). By promoting access to online content through different electronic devices (e.g., computers, tablets, smartphones), the internet has provided an accessible, affordable and anonymous way of using pornography (Cooper, 1998). For example, Pornhub reports showed a large increase in the number of visitors during the last 3 years (2018a, 2018b, 2019, 2020). The website registered 28.5 billion total visits and 81 million daily visits on average in 2017, 33.5 billion total visits with 91 million visitors per day on average in 2018, 42 billion total visits with 115 million visitors per day on average in 2019, and a 18.5% increase in their average worldwide traffic by March 24<sup>th</sup> 2020.

Literature has extensively examined correlates of pornography use, including internet pornography, at individual, relational, and social levels (for reviews, see Carroll et al., 2017; Dwulit & Rzymiski, 2019; Grubbs et al., 2019; Manning, 2006; Park et al., 2016; Rasmussen, 2016; Willoughby et al., 2019; Wright et al., 2016, 2017). For example, individuals who use pornography more frequently tend to have more positive attitudes toward pornography use (Willoughby et al., 2016), score higher on traits such as narcissism (Kasper et al., 2015), and participate in more sexually aggressive behaviors (Vega & Malamuth, 2007). These individuals were found to have more unrealistic expectations about sex and to objectify sexual partners (Hald & Malamuth, 2008; Rissel et al., 2017), and to form sexually intimate relationships without expecting commitment (Braithwaite et al., 2015).

Focusing specifically on romantically involved individuals, research found that solitary pornography use is more frequent, particularly among men, although such differences have been decreasing in recent years (Carroll et al., 2017; Willoughby & Leonhardt, 2020). Research examining the role of pornography for different relationship outcomes, however, offers mixed evidence (for a discussion, see Campbell & Kohut, 2017). For example, most studies found that solitary pornography use is associated with negative outcomes (e.g., more sexual difficulties; Park et al., 2016; Wright et al., 2017), and that greater discrepancies between partners in their solitary pornography use is associated with negative outcomes (e.g., less stability; Willoughby et al., 2016). On the other hand, studies focusing on joint pornography use found associations with positive outcomes (e.g., more sexual satisfaction; Kohut et al., 2018; Maddox et al., 2011; Willoughby & Leonhardt, 2020). These inconsistencies actually resonate with subjective experiences with pornography. When asked about the impact of solitary and joint pornography use on themselves and their relationship, users indicated both negative (e.g., decreased interest in sex with the primary partner; loss of intimacy) and positive aspects (e.g., increased arousal response; sexual experimentation; Kohut et al., 2017).

Instead of focusing on discrepancies between partners in pornography use (e.g., Willoughby et al., 2016), we built on the evidence that pornography use can be positively and negatively associated with sexual relationship outcomes. We took a step further and examined if these associations depended on the relational context (for a discussion, see Willoughby et al., 2019), more precisely on the (non)monogamy agreements. Research found that monogamous individuals who used pornography together with their partner were as satisfied as those with no pornography use, but more so than those who used pornography by themselves (Maddox et al., 2011). To the extent that solitary pornography use has been associated with sexual disinterest toward the primary partner (Park et al., 2016) and sexual

interest toward extradyadic partners (Wright & Randall, 2012), we examined the role of internet pornography on sexual relationship outcomes among monogamous individuals, depending on whether or not they had non-consensual extradyadic sex (i.e., monogamous vs. non-consensual non-monogamous; NCNM). Moreover, individuals in a consensual non-monogamous (CNM) relationship have an agreement allowing for sexual exploration outside the dyad (Cohen, 2016; for a distinction between types of non-monogamy, Conley et al., 2017) without detriment to their relationship quality (Mogilski et al., 2017; Rubel & Bogaert, 2015). To the extent that CNM and monogamous individuals do not differ in relationship quality and sexual satisfaction with the primary partner, whereas NCNM report lower relationship outcomes (e.g., Conley et al., 2018; Rodrigues et al., 2017), we also examined the role of internet pornography on sexual relationship outcomes comparing CNM and both groups of monogamous individuals. To the best of our knowledge, this study is among the first to examine the role of internet pornography use while disentangling monogamous individuals who had and did not had extradyadic sex, and comparing them with CNM individuals.

### **Pornography Use and Relationship Outcomes**

In their meta-analysis of 50 empirical studies, Wright et al. (2017) found that individuals who use pornography are less satisfied with their relationship and with their sex lives. These associations are particularly evident among more frequent users (Willoughby & Leonhardt, 2020; Wright et al., 2018; Wright, Steffen, et al., 2019). The negative association between pornography use and relationship quality is arguably explained by less sexual communication between partners (Wright, Sun, et al., 2019), and greater use of alternative forms of fulfilling sexual needs (e.g., solo masturbation; Miller et al., 2019). Frequent pornography use has also been associated with the activation of pornographic images during sex to maintain arousal in both women (Johnson et al., 2019) and men (Sun et al., 2016),

suggesting more sexual difficulties or sexual disinterest when having sex with the primary partner. Indeed, Park et al. (2016) reported several studies showing that pornography use is associated with decreased libido, problems in sexual performance, and greater difficulty in having an orgasm. Although the associations are likely to be reciprocal, pornography use has been found to predict lower levels of marital quality and romantic break-up six years later (Perry, 2017; Perry & Davis, 2017; Perry & Schleifer, 2018).

There is evidence that pornography use can be positively associated with well-being and relationship outcomes when considering different relationship dynamics (Campbell & Kohut, 2017). Using a dyadic approach, Maas et al. (2018) found that pornography use and relationship satisfaction were negatively associated, but only among partners with lower levels of pornography acceptance. Also, partners with a greater variety of acts in their sex lives, including pornography use, are more sexually satisfied (Frederick et al., 2017). Partners who use pornography together report having a more positive erotic climate (e.g., communication about fantasies) and less sexual problems (e.g., problems with sexual arousal; Daneback et al., 2009), and more sexual satisfaction (Maddox et al., 2011; Willoughby & Leonhardt, 2020). Solitary internet pornography use is less likely among happily married individuals when compared to their less happy counterparts (Stack et al., 2004). However, individuals who are more accepting of pornography use might use it to enhance their sex lives with their partner. Indeed, individuals who use pornography with their partner are also more likely to explore their sexuality and engage in a wider range of pornography-like sexual behaviors (Bridges et al., 2016), and dyadic research indicates that including the partner in pornography use is associated with more open sexual communication, and greater closeness and intimacy (Kohut et al., 2018). These findings suggest that partners who are more open to sexual exploration with each other are also more likely to benefit from pornography use, arguably because it adds novelty and excitement to the relationship (e.g., Rosa et al., 2019).

## **Relationship Agreements and Relationship Quality**

Research focused on pornography use typically does not account for extradyadic behaviors. In a longitudinal study, Leonhardt and Willoughby (2017) found that pornography use predicted less importance attributed to one's marriage and more permissive attitudes toward casual sex one year later. Relatedly, individuals who used pornography more often were more likely to engage in extradyadic sex in the recent past (Wright & Randall, 2012). Frequency of pornography use also predicts intimate extradyadic behavior three months later, because of an increased attention to potential alternative partners (Gwinn et al., 2013). This occurs because frequent pornography users appear to be less committed to their relationship (Lambert et al., 2012), such that among happily married individuals pornography use was not predictive of extradyadic sex two years later (Wright, 2012). These findings suggest that pornography use might be confounded with extradyadic sex and the relationship agreement both partners have, therefore not allowing full understanding of how pornography use is related to relationship quality.

Monogamous individuals have the agreement (often implicit and not discussed with the partner) of not allowing any type of extradyadic behavior. However, some individuals perceive pornography use as a form of infidelity (Negy et al., 2018), as this behavior is often kept a secret from the partner (Kohut et al., 2017) to avoid negative repercussions. Whereas some pornography users might approach their partners to explore sexual variety by using pornography together (Kohut et al., 2018; Miller et al., 2019; Rosa et al., 2019), others might be more likely to engage in alternative strategies to meet their sexual needs, including having extradyadic sex (e.g., Gwinn et al., 2013). When engaged in extradyadic behaviors without their partner's agreement, NCNM individuals may be less likely to use pornography with their primary partner to increase sexual variety. Monogamy contrasts with consensual non-monogamy, in which both partners explicitly agree on having sexual encounters or romantic



relationships with other individuals. Research found that CNM individuals communicate with their primary partner about sex, sexual exploration, and the boundaries of their relationship agreement (Cohen, 2016), and can experience jealousy and feel betrayed when such agreement is violated (Mogilski et al., 2019).

Several studies found that the relational experiences of monogamous individuals do not differ from those of CNM individuals (e.g., Rubel & Bogaert, 2015). For example, both groups of individuals report similar levels of sexual satisfaction with their primary partner (Conley et al., 2018; Mitchell et al., 2020) and tend to activate similar relationship protective strategies with their primary partner (Mogilski et al., 2017). Despite this lack of differences in relationship quality, CNM individuals tend to report more sex-related intrinsic motives for having sex (e.g., sexual activity enjoyment, sex drive satisfaction; Wood et al., 2018; but see Mitchell et al., 2020) and more nonsexual benefits (e.g., need fulfilment; Moors et al., 2017) than their monogamous counterparts. Accounting for extradyadic sex in monogamous relationships, Rodrigues et al. (2017) found that CNM and monogamous individuals were equally satisfied with, and committed to, their relationship, whereas NCNM had the lowest relationship quality. This was independent of the finding that CNM individuals were the most open to casual sex (i.e., unrestricted sociosexually). In a related study, Rodrigues et al. (2019) found that CNM individuals who were more open to casual sex were also more willing to remain in their primary relationship, which was then positively associated with their quality of life. The opposite pattern of results emerged for NCNM individuals. These findings show that (non)monogamous relationship agreements are not necessarily detrimental for the relationship, when compared to unconsented extradyadic sex. However, no research to date has specifically examined how solitary and joint pornography use can shape different sexual experiences individuals have in the primary relationship, depending on their relationship agreement and non-consensual extradyadic sex.

## Current Study and Hypotheses

In this cross-sectional study our first goal was to examine if the frequency of internet pornography use and the frequency of including the primary partner in this activity differed according to relationship type (i.e., monogamous, NCNM, and CNM). The second goal was to examine if sexual satisfaction (with oneself and with the primary partner) and sexual arousal difficulties with the primary partner also differed when comparing relationship types. Finally, the third goal was to examine if the role of internet pornography use on sexual satisfaction and sexual arousal difficulties differed for monogamous, NCNM, and CNM individuals. We examined if patterns of pornography use (i.e., frequency of using internet pornography and including the primary partner in this activity) and sexual relationship outcomes (i.e., sexual satisfaction and sexual arousal difficulties) differed according to relationship type (monogamous, NCNM and CNM). Additionally, we examined if the associations between pornography use and sexual relationship outcomes also depended on relationship type.

We had no reason to expect differences between monogamous and NCNM participants in the frequency with which they use pornography. However, given the association between pornography use, sexual disinterest and extradyadic sex (e.g., Gwinn et al., 2013; Johnson et al., 2019; Park et al., 2016; Sun et al., 2016), we expected NCNM participants to include their partner in such activity less often than monogamous individuals (*Hypothesis 1*). As non-monogamy is associated with sexual exploration, intrinsic motives for having sex and need fulfilment with extradyadic partners (Cohen, 2016; Mitchell et al., 2020; Moors et al., 2017; Wood et al., 2018), but also with relationship quality and well-being (Conley et al., 2018; Rodrigues et al., 2017, 2019), we advanced two possibilities. If CNM participants use extradyadic sex to meet their sexual needs, they may not feel the need to use internet pornography with their primary partner, thus resembling NCNM participants (*Hypothesis*

2a). Alternatively, if CNM participants use internet pornography as a way to increase sexual variety with their primary partner, they should include them more frequently in such activity, thus resembling monogamous individuals (*Hypothesis 2b*).

Based on the evidence that monogamous and CNM individuals do not differ in several relationship quality outcomes (e.g., Conley et al., 2018; Mitchell et al., 2020; Rubel & Bogaert, 2015), whereas NCNM individuals experience less relationship quality (Rodrigues et al., 2017, 2019), we expected monogamous and CNM participants to report similar levels of sexual satisfaction and sexual arousal difficulties with having sex with their primary partner (*Hypothesis 3*). In contrast, NCNM participants were expected to report lower sexual satisfaction and more sexual arousal difficulties with their partner, than both monogamous and CNM individuals (*Hypothesis 4*).

Research shows that solitary pornography use is mostly associated with negative outcomes in the relationship (Wright et al., 2017, 2018; Wright, Steffen, et al., 2019), whereas joint pornography use is typically associated with positive outcomes (Kohut et al., 2018; Maddox et al., 2011; Miller et al., 2019). We hypothesized a similar pattern of associations for monogamous participants. Specifically, we expected frequency of internet pornography use to be negatively associated with ego-centered sexual satisfaction, and sexual satisfaction with the partner, and positively associated with sexual arousal difficulties (*Hypothesis 5a*), whereas the reverse should emerge for joint internet pornography use (*Hypothesis 5b*). Much like monogamous participants, we expected a detrimental role of internet pornography use among NCNM participants (*Hypothesis 6a*), but weaker associations between joint internet pornography use and sexual relationship outcomes (*Hypothesis 6b*). Given the lack of evidence on the role of pornography use on relationship outcomes among CNM individuals, we advanced no *a priori* hypotheses for this group.

## Method

### Participants

The final sample comprised 866 individuals (66.3% women) residing in Portugal, with ages ranging between 18 and 66 years ( $M = 27.40$ ,  $SD = 8.58$ ) who volunteered to take part in this study. A total of 1090 individuals started the online questionnaire. Of these, three did not give their consent and 221 abandoned before completing the questionnaire (participation rate: 79.7%). Most participants identified themselves as heterosexual (84.5%), resided in urban areas (85.2%), completed their graduate studies (82.1%), and indicated to be religious (50.9%). All participants were in a romantic relationship for approximately 5 years ( $M = 5.08$ ,  $SD = 6.11$ ).

### Procedure

An online questionnaire was created using the Qualtrics platform. Research assistants recruited participants using public posts in social media network sites and posts in online groups or forums used by CNM individuals (e.g., Facebook, reddit). These posts announced an anonymous survey about internet pornography and interpersonal relationships and provided a link. When assessing the survey, individuals were informed about the general purpose of the study, and that participation was restricted to individuals who were 18 years or older at the time of participation, who were residing in Portugal, who had already initiated their sexual activity, and who were currently in a romantic relationship. Individuals were also informed that participation was voluntary and confidential, that neither their name nor any identifying information would be attached to their data, and that responses were non-mandatory. Individuals were also informed that they would be eligible to enter a raffle to receive one of two 50€ gift vouchers upon survey completion, and that they could withdraw from the study at any time by closing the web browser—in which case responses would not be considered for the final sample.

After providing informed consent (by clicking in the *I agree* option), participants were presented with demographic questions. Questions asking about pornography use followed a definition of internet pornography. If participants skipped a question they were notified about this but were allowed to proceed. At the end, participants were informed that the objective was to understand if internet pornography was associated with individual sexual responses and interpersonal sexual behaviors in the context of romantic relationships. To enter the raffle, participants had to provide their email address, which was archived in a separate database. The mean completion time for the questionnaire was 14 minutes. This study was conducted in agreement with the Ethics Guidelines issued by [xxx].

## Measures

**Demographic information.** Participants were asked to indicate their age (in years), gender (Woman; Man; Other, please specify), and sexual orientation (Heterosexual; Lesbian or Gay; Bisexual; Other, please specify). They were also asked to indicate where they resided (Urban area; Rural area), highest degree of education achieved (Up to secondary school or equivalent; Undergraduate or equivalent; Master/PhD), and their religion (None; Catholic; Other, please specify). Lastly, participants were asked to indicate the duration of their current relationship in years and months.

**Internet pornography use.** Building upon the work by Træen et al. (2006), we defined internet pornography as “any material containing explicit sexual visual depictions (either professional or amateur) with one or more adults, viewed on any electronic device (e.g., computer, tablet, smartphone)”. We asked participants if they ever deliberately watched internet pornography (1 = *No*, 2 = *Yes*). Those who indicated *Yes* were also asked how frequently they used this type of pornography on a 6-point scale ranging from 1 = *Couple of times in the last 12 months* to 6 = *Several times in the last days* (adapted from Træen et al.,

2004), and how often they included their primary partner in such activity using a 7-point scale (from 1 = *Never* to 7 = *Always*).

**Ego-centered sexual satisfaction.** We used the Ego-focused subscale of the Sexual Satisfaction Scale developed by Štulhofer et al. (2010; Portuguese validation by Pechorro et al., 2016) to examine the extent to which participants were sexually satisfied with themselves. Participants were asked to think about their sex life during the last six months and to indicate their satisfaction with 10 aspects of their sexual activity (e.g., “The quality of my orgasms”). Responses were given on 7-point scales (from 1 = *Not at all satisfied* to 7 = *Extremely satisfied*) and averaged into a composite variable (Cronbach’s  $\alpha = .93$ ).

**Sexual satisfaction with the partner.** We asked participants to think about sexual activity with their primary partner and to characterize their overall sexual satisfactions along three items: from 1 = *Very bad* to 7 = *Very good*, from 1 = *Very unsatisfying* to 7 = *Very satisfying*, and from 1 = *Lacking sexual desire* to 7 = *With a lot of sexual desire*. Responses were averaged into a composite variable (Cronbach’s  $\alpha = .92$ ).

**Sexual arousal difficulties.** We asked participants to indicate if they experienced any difficulties during the last month to sustain arousal when having sex with their primary partner. Responses were recorded on a 7-point scale (from 1 = *No difficulty at all* to 7 = *A lot of difficulty*).

**Relationship information.** Based on past studies (Rodrigues et al., 2017, 2019), we asked participants to select the option that best characterized their current relationship: 1 = *I have an exclusive relationship, such that neither of us can have sex or romantic relationship with other people*, 2 = *I have a relationship that is not sexually exclusive, that is, an open relationship*, 3 = *I have a non-exclusive relationship, that is, a polyamorous relationship*. We also asked participants if they engaged in infidelity: “During your current relationship, have you ever engaged in emotional infidelity (i.e., had romantic feelings for another person

without your partner's consent) or sexual infidelity (i.e., had sex with another person without your partner's consent)?". Responses were recorded on a dichotomous scale (1 = *No* or 2 = *Yes*). We created three relationship type groups based on the alignment between reported relationship agreement and responses to the infidelity question. Participants in an exclusive relationship were categorized as monogamous if they had not engaged in infidelity and as NCNM if they had engaged in infidelity, whereas participants in open or polyamorous relationship were categorized as CNM.

### **Analytical Strategy**

There were no missing cases in any of our outcome variables. Preliminary analyses examined differences in demographic variables according to relationship type and internet pornography use using  $\chi^2$  tests, ANOVAs and *t* tests, to see whether groups had *a priori* differences that needed to be controlled for. Next, we tested *Hypotheses 1* and *2* by examining overall differences in the frequency of internet pornography use and the frequency of including the primary partner in such activity using 3 (relationship type: monogamous, NCNM, CNM) ANCOVAs. We report estimated marginal means and pairwise comparisons with Bonferroni adjustment. We then tested *Hypothesis 3* and *4* and examined if sexual satisfaction and sexual arousal difficulties differed according to relationship type. Again, we conducted ANCOVAs and report estimated marginal means and pairwise comparisons with Bonferroni adjustment. Lastly, we tested *Hypothesis 5* and *6* by computing partial correlations to examine if internet pornography use variables were correlated to sexual satisfaction and sexual arousal difficulty experiences for each group separately.

## **Results**

### **Relationship Type**

Demographic information of monogamous, NCNM and CNM participants is presented in Table 1. As can be seen, there were gender,  $p = .028$ , sexual orientation,  $p < .001$ , and

religion differences,  $p = .018$ , between the groups. No other differences were significant,  $ps > .068$ . Monogamous relationships were more likely among women, heterosexual and religious participants, whereas CNM relationships were more likely among men, non-heterosexual participants, and those without a religion. There were also differences in age,  $p = .001$ , and relationship length,  $p < .001$ . Multiple comparisons with Bonferroni adjustment showed that NCNM participants were older than monogamous participants,  $p = .001$ , and had lengthier relationships than monogamous,  $p = .001$ , and CNM participants,  $p = .002$ . No other comparison reached significance,  $ps > .306$ . Based on these findings, gender, sexual orientation, religion, age, and relationship length were included as covariates in our subsequent analyses.

-- Table 1 about here --

### **Internet Pornography Use**

Overall, the majority of the participants (78.4%) had watched internet pornography: CNM participants were more likely to report this behavior (92.3%) than NCNM (81.9%) or monogamous participants (74.5%),  $\chi^2(2, N = 866) = 18.48, p < .001, V = .15$ . No differences between the latter two groups emerged. Additional analysis showed differences in demographic variables within each group (see Table 2). Internet pornography use was more likely among men in monogamous,  $\chi^2(2, N = 552) = 51.44, p < .001, V = .31$ , and NCNM relationships,  $\chi^2(2, N = 210) = 18.09, p < .001, V = .31$ . In contrast, this behavior was less likely among heterosexual participants in monogamous relationships,  $\chi^2(2, N = 552) = 14.21, p < .001, V = .17$ , and among Catholics in monogamous,  $\chi^2(2, N = 552) = 9.00, p = .011, V = .13$ , and NCNM relationships,  $\chi^2(2, N = 210) = 7.41, p = .025, V = .19$ . It was also less likely in lengthier monogamous,  $t(550) = 3.37, p = .001, d = 0.29$ , and NCNM relationships,  $t(208) = 2.00, p = .047, d = 0.28$ . No other differences were significant, all  $ps > .065$ .

-- Table 2 about here --



### **Hypotheses 1 and 2: Internet Pornography Use**

Results of two ANCOVAs showed a main effect of relationship type in the frequency with which participants used internet pornography,  $F(2,671) = 23.37, p < .001, \eta_p^2 = .07$ , and included the primary partner in such activity,  $F(2,671) = 8.21, p < .001, \eta_p^2 = .02$ . Figure 1 depicts the adjusted means for each outcome variable according to relationship type.

-- Figure 1 about here --

Pairwise comparisons with Bonferroni adjustment showed that CNM participants used internet pornography more often than monogamous,  $p < .001$ , and NCNM participants  $p < .001$ . They also included their primary partner in such activity more often than monogamous,  $p = .001$ , and NCNM participants  $p < .001$ . No differences between monogamous and NCNM participants emerged in the frequency with which participants used internet pornography,  $p = .190$ , or included their partner in such activity,  $p = 1.00$ .

### **Hypotheses 3 and 4: Sexual Satisfaction and Sexual Arousal Difficulties**

Results of three ANCOVAs showed a main effect of relationship type in ego-centered sexual satisfaction,  $F(2,858) = 19.87, p < .001, \eta_p^2 = .04$ , and sexual satisfaction with the primary partner,  $F(2,858) = 14.43, p < .001, \eta_p^2 = .03$ , and in the experience of difficulties with sustaining sexual arousal,  $F(2,858) = 9.13, p < .001, \eta_p^2 = .02$ . Figure 2 depicts the adjusted means for each outcome variable according to relationship type.

-- Figure 2 about here --

Pairwise comparisons with Bonferroni adjustment showed that monogamous and CNM participants were equally satisfied with themselves,  $p = .194$ , and with their primary partner,  $p = 1.00$ , and reported similar experiences with sexual arousal difficulties,  $p = 1.00$ . In contrast, NCNM participants were less sexually satisfied with themselves when compared to monogamous,  $p < .001$ , and CNM participants,  $p = .033$ . They were also less sexually satisfied with their primary partner when compared to monogamous,  $p < .001$ , and CNM

participants,  $p = .015$ , and reported more sexual arousal difficulties than monogamous,  $p < .001$ , and CNM participants,  $p = .026$ .

### **Hypotheses 5 and 6: Internet Pornography Use and Sexual Relationship Outcomes**

Partial correlations among participants who used internet pornography (see Table 3) showed that the frequency of internet pornography use was positively correlated with the frequency of including the partner in this activity for monogamous,  $p < .001$ , NCNM,  $p = .003$ , and CNM participants,  $p = .017$ . Fisher's  $r$  to  $z$  transformation showed no significant differences between the correlation coefficients of monogamous and NCNM participants,  $p = .401$ . For monogamous participants only, frequency of internet pornography use was also negatively correlated with ego-centered sexual satisfaction,  $p = .012$ , and sexual satisfaction with the partner,  $p = .020$ . In contrast, frequency of including the partner in internet pornography use was positively correlated with ego-centered sexual satisfaction for monogamous,  $p = .016$ , and NCNM participants,  $p = .014$ . Again, correlation coefficients did not significantly differ,  $p = .218$ . This variable was also positively correlated with sexual satisfaction with the partner for monogamous,  $p = .002$ , NCNM,  $p = .002$ , and CNM participants,  $p = .030$ . The correlation coefficients of monogamous and NCNM participants were not significantly different,  $p = .161$ . For monogamous participants only, frequency of including the partner in internet pornography use was also negatively correlated with sexual arousal difficulties,  $p = .028$ . In either case were the correlation coefficients of CNM participants different from those of the other two groups,  $ps > .257$ .

-- Table 3 about here --

### **Discussion**

In the current cross-sectional study, we examined if patterns of internet pornography use (*Hypotheses 1 and 2*) and sexual relationship outcomes (*Hypotheses 3 and 4*), as well as the association between these variables (*Hypotheses 5 and 6*) differed by relationship type.

Preliminary analyses showed that, in many ways, our results reflected those of previous studies, suggesting that our findings were not simply the product of specific sampling methods. Like past research, we found that deliberate use of internet pornography was more likely among men, non-heterosexual individuals, and non-Catholic individuals (e.g., Rissel et al., 2017; Træen & Daneback, 2013). However, none of these differences emerged for CNM individuals, including those pertaining to the gender gap in pornography use (Carroll et al., 2017). This shows the importance of assessing multiple dimensions (e.g., individual background factors, relational context) when examining the role of pornography use on couple processes (Willoughby et al., 2019). Also, our finding that individuals in monogamous and CNM relationships are younger, compared to individuals in NCNM relationships, indicates that younger individuals may be more open to having alternative relationship agreements and consensual relationship dynamics (Carroll et al., 2017; Sizemore & Olmstead, 2017), and challenge the idea that consensual non-monogamy is perceived as a result of sexual dissatisfaction (e.g., Balzarini et al., 2018; Conley et al., 2013).

Examining patterns of internet pornography use, we found no differences in the percentage of monogamous and NCNM individuals who have deliberately watched internet pornography, or in the frequency with which they use it. Both monogamous and NCNM individuals (i.e., those who have engaged in emotional or sexual infidelity during their current relationship) included their primary partner in pornography use equally often (not supporting *Hypothesis 1*). We are unable to explain this novel finding with our current evidence, but we would speculate that monogamous individuals jointly use pornography to add sexual novelty or act out sexual fantasies (e.g., Rosa et al., 2019), or as a mate retention strategy to prevent extradyadic behaviors and/or increase sexual interest to the primary partner. In contrast, NCNM individuals are more unrestricted in their sociosexuality (Rodrigues et al., 2017), and may need to engage in sexual-based activities more often, be it

with the primary partner or with extradyadic partners. We also found that CNM individuals used internet pornography the most and were the most likely to include their primary partner in pornography use (supporting *Hypothesis 2b*). These findings align with past research showing that CNM individuals enjoy sex with their primary partner despite being more unrestricted in their sociosexuality and having more lifetime sexual partners than monogamous and NCNM individuals (Lehmiller, 2015; Rodrigues et al., 2017). For these individuals, and similar to CNM individuals, joint internet pornography use may be a way to meet individual sexual needs. Furthermore, if we take this activity as a proxy of sexual activity with the primary partner, CNM individuals are likely to have sex with their primary partner the most. This extends our knowledge of the relationship dynamics between CNM partners, in the sense that consensually allowing extradyadic partners does not necessarily equate as lacking sexual desire or sexual activity in the primary relationship.

Examining the sexual relationship outcomes in each group, we also found that monogamous and CNM individuals did not significantly differ in how sexually satisfied they were with themselves and with their partner and did not differ in terms of arousal difficulties when having sex with their (primary) partner (supporting *Hypothesis 3*). NCNM individuals, in contrast, were the least sexually satisfied with themselves and with their primary partner and reported the most sexual arousal difficulties (supporting *Hypothesis 4*). These findings replicate past research regarding sexual satisfaction (Conley et al., 2018) and extending our understanding by showing how relationship agreements and extradyadic sex shape sexual satisfaction and sexual difficulties from ego- and dyadic-centered point of views. Overall, these findings complement evidence on relationship agreements and relationship quality (Rodrigues et al., 2017).

As for the associations between pornography use and sexual relationship outcomes, we found some differences between relationship types. Monogamous NCNM and CNM

individuals who used internet pornography more frequently also included their primary partners more frequently in such activity. This finding resonates on recent evidence showing that individuals are increasingly using internet pornography with their partners (Willoughby et al., 2019), and suggests that such trend is extended to different relationship types. Among monogamous individuals only, those who reported a frequent pornography use also indicated to be sexually dissatisfied (partially supporting *Hypothesis 5a*), but those who frequently included their partner in pornography use indicated to be sexually satisfied and more able to sustain their sexual arousal (supporting *Hypothesis 5b*).

Considering that the experience of sexual arousal difficulties was found to be inversely related to the experience of sexual satisfaction and communication about sex (Štulhofer et al., 2010), monogamous individuals might use internet pornography with their partner as a strategy to explore their sexuality, deal with a lack of sexual novelty in the relationship (Rosa et al., 2019), or jointly work around any experienced sexual difficulty. Indeed, clearer communication about sex is associated with greater relationship quality, which in turn is a protective factor against extradyadic sex in monogamous relationships (Sprecher & Cate, 2004). For NCNM individuals, internet pornography use was unrelated with sexual relationship outcomes (not supporting *Hypothesis 6a*), but joint use was associated with overall sexual satisfaction (partially supporting *Hypothesis 6b*). To the extent that sexual dissatisfaction is predictive of infidelity (Fincham & May, 2017), and based on our finding that internet pornography use by itself was unrelated to sexual relationship outcomes, the extradyadic sex of NCNM individuals was arguably predicted by variables other than the use of pornography.

We did not advance hypotheses about the role of internet pornography in sexual outcomes among CNM individuals due to a lack of past empirical evidence. As with the other two groups, we found that individuals who more frequently participated in joint internet

pornography were also sexually satisfied with their primary partner. Similar to their monogamous counterparts, joint internet pornography use by CNM individuals may have the purpose of increasing relational sexual experiences with the primary partner, increase dyadic sexual novelty, and make sure that both partners share a positive experience when having sex with each other. In contrast to monogamous individuals, but aligned with NCNM ones, we also found that pornography use was not associated with ego-centered sexual satisfaction. This may be explained by the nature of the consensual agreement itself. Arguably, CNM individuals may seek other partners and alternative sexual experiences to explore their own sexual needs without damaging the primary relationship, but at the same time actively work on the sexual aspects of their primary relationship to feel emotionally connected to their primary partner and avoid any feeling that they are becoming less important in their lives (Mogilski et al., 2017; Moors et al., 2017; Rodrigues et al., 2017, 2019; Wood et al., 2018; Mitchell et al., 2020). Findings for this group of individuals clearly show the importance of accounting for relationship agreements and the use of pornography with the primary partner, rather than pornography use in itself, when examining relationship outcomes.

### **Strengths, Limitations, and Future Research**

Overall, our study examined multiple dimensions proposed by Willoughby et al. (2019) in their organizational framework for pornography research. Our key strength was the consideration of relational contexts (relationship types and agreements) and couple processes (sexual relationship outcomes), while controlling for individuals background factors (e.g., gender) that are established correlates of pornography use. In some ways, our findings reflect those of previous studies, suggesting that our findings were not simply the product of specific sampling methods. In other ways, our findings enable a broader understanding of how internet pornography use (and its use with the primary partner) shape sexual outcomes in different relationship types.

Our current findings must also be considered in light of some limitations. Our pornography use measures may be potentially confounded. For example, some participants may have watched internet pornography prior to the last 12 months, and may have considered a combination of solitary and joint internet pornography use. Given the lack of missing responses to the frequency question, we believe that all participants who ever watched internet pornography also did it so within the last 12 months. Moreover, the mostly small correlations between the frequency of internet pornography use and the frequency of joint use suggest that there is very limited overlap between the two types of pornography use.

Our data are cross-sectional and we are unable to explore if watching internet pornography with the partner increases sexual satisfaction or if sexually satisfied partners decide to watch internet pornography together. Future studies should use longitudinal designs and add dyadic data to examine the interplay between partners, and increase the sample size—particularly that of NCNM and CNM individuals—to have a more direct test of the moderating role of relationship type on the association between internet pornography use and sexual relationship outcomes. Future studies should also include other sexuality-related measures. For example, research shows that open communication about sexual needs is associated with sexual satisfaction (Jones et al., 2018) and that partners who use pornography together, compared to those who do not, have more open sexual communication (Kohut et al., 2018). Hence, communications about sexual novelty, including pornography use might also be associated with personal and relational sexual outcomes (Frederick et al., 2017; Rosa et al., 2019). This should be particularly relevant because our study offers mixed evidence regarding the role of pornography use for sexual-related outcomes, depending on the relationship type.

Future studies should also seek to examine how many times NCNM individuals engaged in extradyadic behaviors, or if they engaged only in emotional and/or sexual

infidelity. Individuals characterized by a single episode of infidelity may be more motivated to work on the relationship out of guilt and fear of losing the partner, whereas individuals who engage in infidelity more often may be less interested in their relationship and avoid sexual intimacy with their partner (e.g., Knopp et al., 2017). In addition, individuals may have different understandings of infidelity (e.g., de Visser et al., 2020). For some it may include any extradyadic sexual fantasies, for others only extradyadic sexual behavior or a combination of both. By distinguishing between different personal concepts of infidelity, it would be possible to address the associations between pornography use and sexual relationship outcomes more accurately.

Future studies should also consider certain individual characteristics, such as masturbation frequency and religiosity. Fulfilling one's sexual needs alone (and presumably avoiding sexual intimacy with the partner) may explain the association between pornography use and relationship quality (Lehmiller, 2015; Perry, 2019). Research focused on the moral incongruence hypothesis (for a review, see Grubbs et al., 2019) suggests that problems associated with pornography use (e.g., negative sexual relationship outcomes) may result from the moral disapproval of pornography use. It would be interesting to test if this hypothesis holds when both partners agree on using internet pornography together (as opposed to solitary use). Lastly, future studies should examine if CNM individuals use internet pornography with their primary partner as a strategy to maintain/increase their intimacy, as well as a confirmation of the importance of the primary relationship. For example, research framed by the Interpersonal Exchange Model of Sexual Satisfaction (Lawrance & Byers, 1995) could examine if the inclusion of the primary partner in internet pornography use is positively or negatively associated with sexual satisfaction, and also perceived as rewarding or costly to their personal and relational sexual satisfaction.



## **Conclusion**

Our study contributes to the literature by showing that internet pornography, particularly when using it together with the partner, may be beneficial for sexual satisfaction. It also shows that these benefits are dependent on relationship agreements about monogamy. For monogamous individuals, internet pornography use with the partner is associated with personal and relational benefits and may even be a protective factor against extradyadic sexual behaviors. For NCNM individuals these benefits may be a consequence of their previous extradyadic behavior. Finally, for CNM individuals, including the primary partner in internet pornography use could mostly have relational benefits.

Overall, the current study's findings indicate a need to educate young adults on the range of implications that pornography use can have in the context of romantic relationships. Both positive and negative implications of pornography use, particularly together with the partner, should be discussed as a part of emerging pornography literacy interventions (e.g., Dawson, 2019; Dawson et al., 2019a, 2019b; Rothman et al., 2018).

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Table 1

*Demographic Information According to Relationship Type*

	Monogamous <i>n</i> = 552 (63.7%)	NCNM <i>n</i> = 210 (24.2%)	CNM <i>n</i> = 104 (12.0%)	$\chi^2$	<i>V</i>
Gender					
Women	382 <sup>a</sup> (69.2%)	133 <sup>a,b</sup> (63.3%)	59 <sup>b</sup> (56.7%)	7.17*	.09
Men	170 <sup>a</sup> (30.8%)	77 <sup>a,b</sup> (36.7%)	45 <sup>b</sup> (43.3%)		
Sexual orientation					
Heterosexual	485 <sup>a</sup> (87.9%)	181 <sup>a</sup> (86.2%)	66 <sup>b</sup> (63.5%)	40.23***	.22
Non-heterosexual	67 <sup>a</sup> (12.1%)	29 <sup>a</sup> (13.8%)	38 <sup>b</sup> (36.5%)		
Residence					
Urban areas	460 (83.3%)	186 (88.6%)	92 (88.5%)	4.30	.07
Rural areas	92 (16.7%)	24 (11.4%)	12 (11.5%)		
Education					
Undergraduates	88 (15.9%)	41 (19.5%)	26 (25.0%)	5.39	.08
Graduates	464 (84.1%)	169 (80.5%)	78 (75.0%)		
Religion					
None	277 <sup>a,b</sup> (50.2%)	89 <sup>b</sup> (42.4%)	59 <sup>a</sup> (56.7%)	11.90*	.08
Catholic	205 <sup>a</sup> (37.1%)	80 <sup>a</sup> (38.1%)	27 <sup>b</sup> (26.0%)		
Other	70 <sup>a</sup> (12.7%)	4 <sup>b</sup> (19.5%)	18 <sup>a,b</sup> (17.3%)		
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>F</i>	$\eta_p^2$
Age (years)	26.63 <sup>a</sup> (8.01)	29.10 <sup>b</sup> (9.02)	28.12 <sup>a,b</sup> (9.99)	6.83***	.02
Relationship length (years)	4.72 <sup>a</sup> (5.69)	6.51 <sup>b</sup> (7.01)	4.06 <sup>a</sup> (5.89)	8.25***	.02

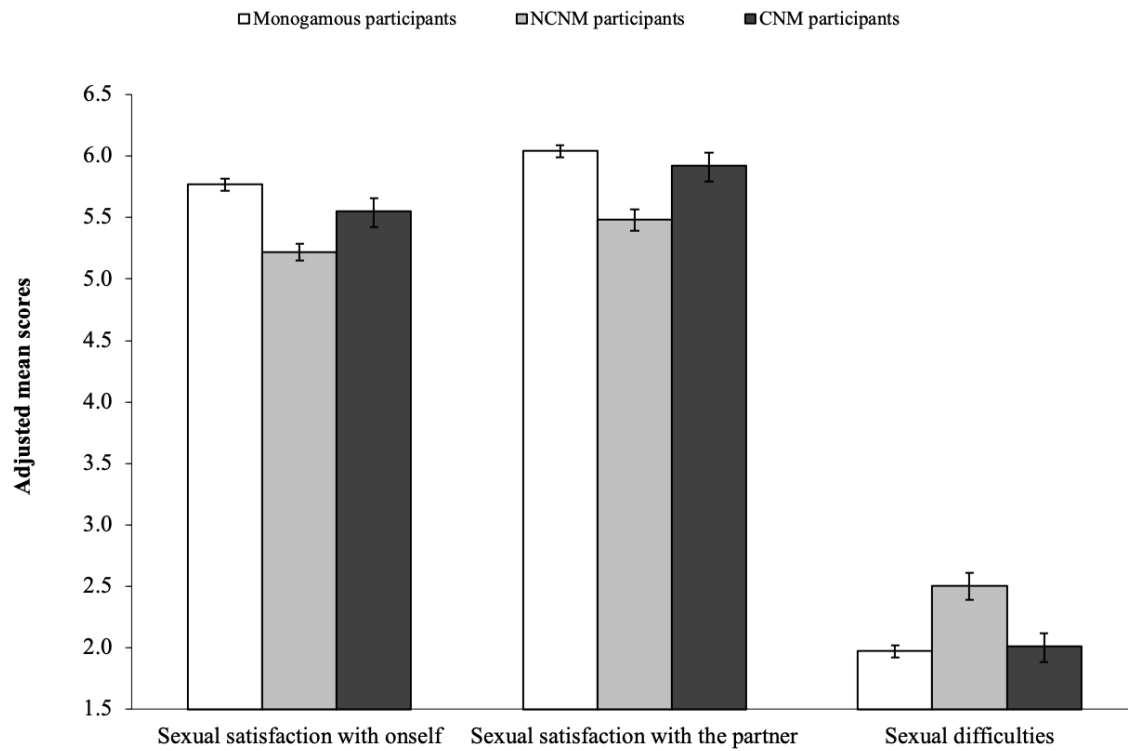
*Note.* NCNM = non-consensual non-monogamous. CNM = consensual non-monogamous. Different superscripts (<sup>a,b</sup>) denote significant differences between relationship type groups. \*  $p \leq .050$ . \*\*  $p \leq .010$ . \*\*\*  $p \leq .001$ .

Table 2

*Internet Pornography Use According to Relationship Type*

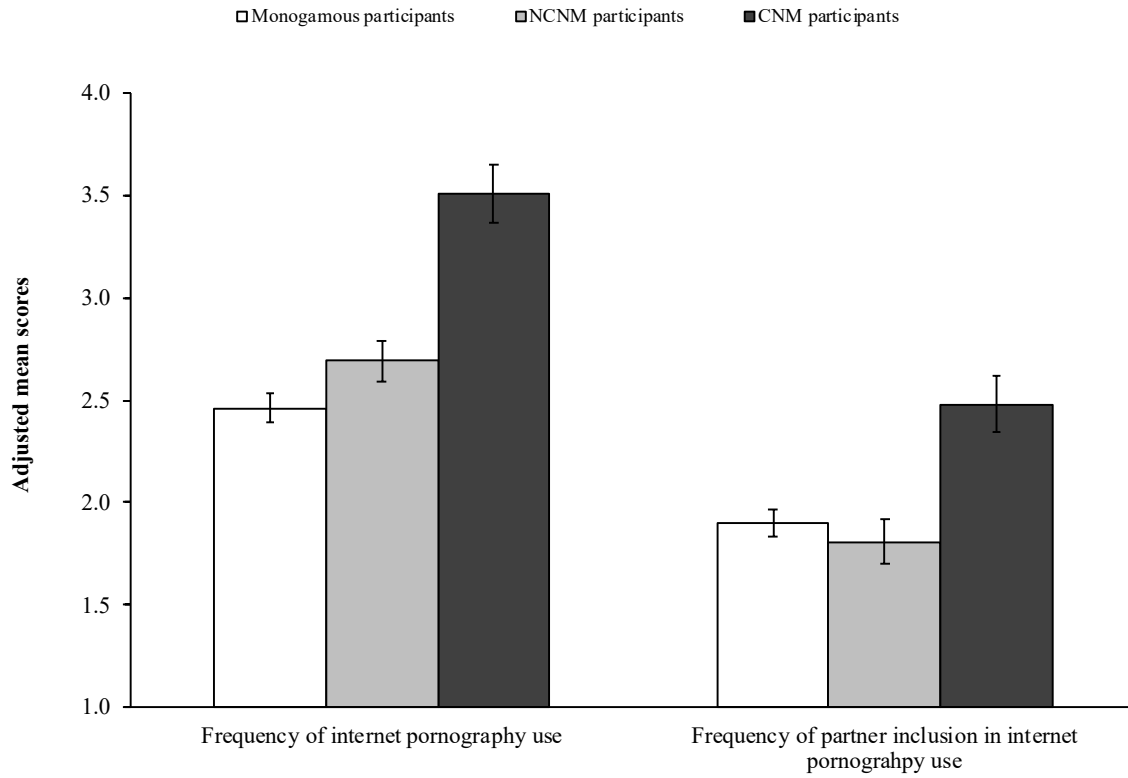
Internet pornography use	Monogamous		NCNM		CNM	
	No	Yes	No	Yes	No	Yes
	<i>n</i> = 141 (25.5%)	<i>n</i> = 411 (74.5%)	<i>n</i> = 38 (18.1%)	<i>n</i> = 172 (81.9%)	<i>n</i> = 8 (7.7%)	<i>n</i> = 96 (92.3%)
Gender						
Women	132 <sup>a</sup> (93.6%)	250 <sup>b</sup> (60.8%)	36 <sup>a</sup> (94.7%)	97 <sup>b</sup> (56.4%)	7 (87.5%)	52 (54.2%)
Men	9 <sup>a</sup> (6.4%)	161 <sup>b</sup> (39.2%)	2 <sup>a</sup> (5.3%)	75 <sup>b</sup> (43.6%)	1 (12.5%)	44 (45.8%)
Sexual orientation						
Heterosexual	137 <sup>a</sup> (97.2%)	348 <sup>b</sup> (84.7%)	35 (91.1%)	146 (84.9%)	5 (62.5%)	61 (63.5%)
Non-heterosexual	4 <sup>a</sup> (2.8%)	63 <sup>b</sup> (15.3%)	3 (7.9%)	26 (15.1%)	3 (37.5%)	35 (36.5%)
Residence						
Urban areas	111 (80.1%)	347 (84.4%)	32 (84.2%)	154 (89.5%)	6 (75.0%)	86 (89.6%)
Rural areas	28 (19.9%)	64 (15.6%)	6 (15.8%)	18 (10.5%)	2 (25.0%)	10 (10.4%)
Education						
Undergraduates	20 (14.2%)	68 (16.5%)	12 (31.6%)	29 (16.9%)	2 (25.0%)	24 (25.0%)
Graduates	121 (85.8%)	343 (83.5%)	26 (68.4%)	143 (83.1%)	6 (75.0%)	72 (75.0%)
Religion						
None	56 <sup>a</sup> (39.7%)	221 <sup>b</sup> (53.8%)	16 <sup>a</sup> (42.1%)	73 <sup>a</sup> (42.4%)	3 (37.5%)	56 (58.3%)
Catholic	66 <sup>a</sup> (46.8%)	139 <sup>b</sup> (33.8%)	20 <sup>a</sup> (52.6%)	60 <sup>b</sup> (34.9%)	4 (50.0%)	23 (24.0%)
Other	19 <sup>a</sup> (13.5%)	51 <sup>a</sup> (12.4%)	2 <sup>a</sup> (5.3%)	39 <sup>b</sup> (22.7%)	1 (12.5%)	17 (17.7%)
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
Age (years)	27.55 (9.96)	26.31 (7.21)	29.16 (12.84)	29.01 (7.99)	28.75 (14.25)	28.06 (9.66)
Relationship length (years)	6.10 <sup>a</sup> (7.34)	4.25 <sup>b</sup> (4.91)	8.55 <sup>a</sup> (11.53)	6.06 <sup>b</sup> (5.50)	6.18 (9.99)	3.89 (5.46)

*Note.* NCNM = non-consensual non-monogamous. CNM = consensual non-monogamous. Different superscripts (<sup>a,b</sup>) denote significant differences between internet pornography use groups (*No* vs. *Yes*) within each relationship type, all *ps* < .050.



*Note.* NCNM = non-consensual non-monogamous. CNM = consensual non-monogamous. Adjusted mean scores controlling for gender, sexual orientation, religion, age and relationship length.

*Figure 2.* Sexual Satisfaction and Sexual Arousal Difficulties According to Relationship Type



*Note.* NCM = non-consensual non-monogamous. CNM = consensual non-monogamous. Adjusted mean scores controlling for gender, sexual orientation, religion, age and relationship length.

*Figure 1.* Internet Pornography Use According to Relationship Type



Table 3

*Correlations According to Relationship Type*

	Correlations			
	2	3	4	5
<b>Monogamous (<i>n</i> = 411)</b>				
1. Frequency of internet pornography use	.25***	-.13*	-.12*	.02
2. Frequency of partner inclusion in internet pornography use	-	.12*	.15**	-.10*
3. Ego-centered sexual satisfaction		-	.70***	-.49***
4. Sexual satisfaction with the primary partner			-	-.47***
5. Sexual arousal difficulties				-
<b>NCNM (<i>n</i> = 172)</b>				
1. Frequency of internet pornography use	.23**	-.07	-.06	-.03
2. Frequency of partner inclusion in internet pornography use	-	.19*	.24**	-.13
3. Ego-centered sexual satisfaction		-	.63***	-.47***
4. Sexual satisfaction with the primary partner			-	-.63***
5. Sexual arousal difficulties				-
<b>CNM (<i>n</i> = 96)</b>				
1. Frequency of internet pornography use	.25*	.12	.03	-.04
2. Frequency of partner inclusion in internet pornography use	-	.18	.23*	-.01
3. Ego-centered sexual satisfaction		-	.62***	-.40***
4. Sexual satisfaction with the primary partner			-	-.36***
5. Sexual arousal difficulties				-

*Note.* NCNM = non-consensual non-monogamous. CNM = consensual non-monogamous. Degrees of freedom for monogamous = 404, NCNM = 165, and CNM = 89. \*  $p \leq .050$ . \*\*  $p \leq .010$ . \*\*\*  $p \leq .001$ .