Pornography Use and Sexual Health among Same-Sex and Mixed-Sex Couples: An Event-Level Dyadic Analysis

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Pornography Use and Sexual Health among Community Couples: An Event-Level Dyadic Analysis

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Abstract

A large number of partnered individuals regularly use or are in a relationship with someone who uses pornography. However, knowledge concerning the association between pornography use and partnered sexual health—sexual satisfaction, distress, and function—is fragmentary. The current study used an event-level dyadic design to examine the associations between pornography use and sexual satisfaction, distress, and function on days when partnered sexual activity occurred. A convenience sample of 217 couples (M_{age} = 30.2; SD = 8.3; 72 same-sex couples) completed a short survey on days of sexual activity with their partner, over a 35-day period. Self-report measures included questions about today's pornography use and masturbation as well as sexual satisfaction, distress, and function. Using pornography on days of partnered sexual activity was reported by half of the couples. An individual's solitary pornography use on days of partnered sexual activity was related to their partner's higher sexual distress and, for women's use only, to their own higher quality of lubrication, compared to sex days without solitary pornography use. There was no evidence of an association between pornography use on sex days, whether alone or with the partner, and all other aspects of sexual health including sexual satisfaction. Our findings capture the complexity of the associations between pornography and sexual health. Men and women's pornography use may create idealized fantasies around appearance and performance, which may lead the partner to feel distressed about their sex life. Women's pornography use might facilitate their sexual responsiveness during partnered sexual activity.

Keywords: Pornography use; Sexual health; Partnered sexuality; Dyadic daily diaries.

A large number of partnered individuals in Western societies regularly view or are in a relationship with someone who views pornography (Carroll, Busby, Willoughby, & Brown, 2017). The wide-ranging sexual content available in pornography is usually less representative of real-life sexual activity and as such, may affect individuals' sexual interactions and eventually, their sexual health. Sexual health — which, in line with past studies, was defined as being sexually satisfied, reporting low sexual distress, and good sexual function (Wellings, 2012) — is an important part of physical and emotional health. Theoretical propositions contend that viewing pornography may condition sexual expectations and responses to specific pornographic content that is not necessarily present in partnered sex (Hoffmann, Janssen, & Turner, 2004). Users could find more excitement in self-selected pornography and a diminished desire, responsivity, arousal, and satisfaction for partnered real-life stimulation (Miller, McBain, Li, & Raggatt, 2017). Unrealistic expectations around appearance and performance may affect users and their partners' sexual function and increase sexual distress, as they cannot achieve pornography's unattainable standards (Kohut, Fisher, & Campbell, 2017). These hypotheses might be particularly true when pornography use and partnered sexual activity occur close in time, such as on the same day.

In line with this theoretical understanding, some have suggested that pornography may lead to sexual dysfunction (Dwulit & Rzymski, 2019; Park et al., 2016). Yet, most empirical work has focused exclusively on specific components of sexual health, particularly erectile dysfunction and sexual satisfaction; only a handful of studies examined sexual health indicators in the context of committed relationships; and most studies confound solitary and partnered sexual activity, using vague retrospective assessments that preclude knowledge concerning whether pornography use and sexual activity with the partner occurred close in time (e.g.,

lifetime pornography use and general sexual function). The current study used an event-level

dyadic design to examine the associations between pornography use and sexual satisfaction,

distress, and function on days of partnered sexual activity.

Findings from a recent meta-analysis showed that across studies, women's pornography

use was unrelated to their own sexual satisfaction, and men's use was negatively related to their

sexual satisfaction (Wright, Tokunaga, Kraus, & Klann, 2017). Even if little research has looked

beyond satisfaction measures, qualitative studies found that some respondents perceived that

pornography use decreased their desire for partnered sex as well as their ability to achieve or

maintain sexual arousal or to achieve orgasm (Grov, Gillespie, Royce, & Lever, 2011; Kohut et

al., 2017). However, both cross-sectional and longitudinal quantitative studies indicated

nonsignificant associations with sexual function, including erectile and orgasmic difficulties in

men (Grubbs & Gola, 2019; Landripet & Štulhofer, 2015; Prause & Pfaus, 2015). Still, some

studies found that men and women's pornography use was related to their own stronger desire

for sex with a partner (Prause & Pfaus, 2015; Willoughby & Leonhardt, 2020) and with lower

levels of sexual dysfunction (Blais-Lecours, Vaillancourt-Morel, Sabourin, & Godbout, 2016).

Thus, although some authors argue that there is enough preliminary evidence to consider

pornography use as one of the causes of sexual dysfunction (Park et al., 2016), current

quantitative research appears inconsistent with this claim.

Important conceptual and methodological limitations may explain this lack of consensus.

Most studies to date have not examined sexual health among couples, but rather included both

partnered and single individuals—mostly men—and did not assess sexual indicators related to

partnered sexual activity separately from those related to solitary sexual activity (Blais-Lecours

et al., 2016; Grubbs & Gola, 2019; Landripet & Štulhofer, 2015). Sexual disturbances may be

experienced only during partnered sexual activity, when the high level of visual stimulation from a specific pornographic content is not present. The use of non-dyadic samples also precludes the examination of how an individual's pornography use influences their partner. Interestingly, cross-sectional dyadic studies showed that men's pornography use was related to their female partner's lower sexual desire and satisfaction (Poulsen, Busby, & Galovan, 2013; Willoughby & Leonhardt, 2020). All of these studies used retrospective measures of sexual health, which do not take into account the factors—including having used pornography today or not—that can vary across time and sexual interactions. Event-level measures better capture changes in sexual satisfaction, distress, and function across these sexual interactions. Thus, they can contrast the quality of partnered sexual activity between days of sexual activity where pornography use occurred, and those without pornography use. Most of the published studies also assessed only specific components of sexual health, particularly erectile dysfunction (Grubbs & Gola, 2019; Landripet & Štulhofer, 2015), with women's sexual function rarely examined and sexual distress, completely overlooked. Yet, qualitative studies suggest that pornography use may be related to the user or their partner's feeling sexually inadequate, which is a core aspect of sexual distress, along with feelings of anxiety or discomfort about the sexual relationship (Grov et al., 2011; Kohut et al., 2017).

Other confounding or moderating variables may also explain past studies' mixed findings. Although it is established that outcomes associated with pornography use are often gendered, with more negative effects being related to men's use compared to null or positive effects for women's use (Willoughby & Leonhardt, 2020; Wright et al., 2017), the majority of past studies included only men (Grubbs & Gola, 2019; Prause & Pfaus, 2015). Men also tend to use pornography more frequently than women (Carroll et al., 2017), thus user's sex may

moderate the effect of pornography use on sexual health. Further, using pornography is often accompanied by masturbation (Sun, Bridges, Johnson, & Ezzell, 2016), suggesting that the effects on partnered sexual activities may be those of masturbation and not of pornography use per se (Prause, 2019). Although few researchers have made serious attempts to actively rule out third-variable explanations, particularly masturbation, in one study the association between pornography use and relationship happiness disappeared when masturbation was accounted for (Perry, 2020). As frequency of pornography use and masturbation are highly correlated in retrospective reports, intensive designs may help disentangle their effects. In romantic relationships, pornography may also be used alone, i.e., solitary use, or with the partner, i.e., dyadic use. Most studies showed that dyadic use was related to more positive relationship outcomes, including more open sexual communication and higher sexual satisfaction (Kohut, Balzarini, Fisher, & Campbell, 2018; Willoughby & Leonhardt, 2020), but the knowledge about the association between dyadic use and sexual satisfaction, distress, and function related to partnered sexual activity is fragmentary.

Current Research

The present study examined dyadic event-level associations between an individual's pornography use and their own and their partner's sexual satisfaction, distress, and function on days when partnered sexual activity occurred. This main objective also included the moderating role of the user's sex, controlled for masturbation, and examined the differential effects of using alone versus with the partner. The hypotheses of this study were not pre-registered. Based on findings reporting negative associations for men's use and null associations for women's use (Wright et al., 2017), we hypothesized that on days of partnered sexual activity, men's solitary pornography use would be associated with their own and their partner's lower sexual satisfaction

and function, and higher sexual distress, whereas women's solitary pornography use would be unrelated to their own and their partner's sexual satisfaction, distress, and function. Dyadic use would be associated with higher sexual satisfaction and function as well as lower sexual distress. To better understand the general associations between pornography use and sexual function, post-hoc exploratory analyses were also pursued in subsequent models. Indeed, as sexual function's total score combined distinct components of the sexual response, we also examined in an exploratory manner the associations with the five subscales of sexual function: sexual desire or receptivity, ease of arousal or erection, quality of lubrication or erection, orgasmic function, and degree of pleasure.

Method

Participants

Couples were recruited in two Canadian cities through print and online advertisements. Interested participants were contacted for a brief screening telephone interview. To be eligible, both partners had to be at least 18 years of age, living together for at least 12 months, and sexually active at least once a month over the past three months. Couples were not eligible if one partner was pregnant or breastfeeding, was unable to read either French or English, reported a severe mental or physical illness that affected their sexuality, or took prescribed medications regularly that affected their sexuality. Of the 519 couples who contacted the research team, 254 (48.9%) could not be reached, were not eligible, or one or both partners were not interested to participate, 30 (5.8%) dropped out during the background survey, five (1.0%) failed two out of three attention-testing questions in the background survey, one (0.2%) asked that their data be removed from the study, 11 (2.1%) dropped out before starting the daily diaries or during the first two days, one (0.2%) was excluded because of an error in data collection, and six (1.2%)

were excluded as they reported no days with sexual activity with their partner during the study, resulting in a final sample of 211 couples (422 participants).

This sample included 247 women (58.5%), 174 men (41.2%) and 1 intersex person (0.2%) who identified as a man. These individuals formed 72 same-sex couples (34.1%; 54 women-women and 18 men-men) and 139 mixed-sex couples (65.9%). Participants ranged in age from 18 to 70 years ($M = 30.17$, $SD = 8.34$). The majority of participants described their cultural identity as French Canadian (37.7%; $n = 159$) or English Canadian (36.7%; $n = 155$), followed by American (11.1%; $n = 47$), European (5.2%; $n = 22$), and a range of other cultural identities (9.2%; $n = 39$). On average, participants reported 16.65 years of education ($SD = 2.82$) which corresponds to a college undergraduate degree. In Canada, 15.5% of Canadians aged 15 years and over completed a bachelor's degree (Statistics Canada, 2017). More than half of participants reported an average annual income of less than $40,000 CAD (62.6%; $n = 264$); $40,000 to $69,999 (27.0%; $n = 114$); and more than $70,000 (10.4%; $n = 44$). In 2019, the average annual salary in the Canadian province where this study was conducted was $49,312 CAD (Statistics Canada, 2019). About half of participants defined their sexual orientation as heterosexual (57.1%; $n = 241$), with 11.4% ($n = 48$) identifying as bisexual, 16.8% ($n = 71$) as gay/lesbian, 8.5% ($n = 36$) as queer, 4.0% ($n = 17$) as pansexual, and 2.1% ($n = 9$) as "other" including asexual or uncertain. Couples had been in their current relationship from 1 to 38 years ($M = 5.90$, $SD = 5.04$). Most were living together without being married (72.5%; $n = 153$) and 27.5% were married ($n = 58$). A total of 78.7% ($n = 166$) of couples had no children, with others reporting between 1 and 5 children ($M = 0.46$, $SD = 1.02$).

Procedure

Data were collected between March 2017 and June 2018 as part of a larger dyadic daily diary and longitudinal research investigating factors associated with sexual well-being in couples. Another published paper involving the complete 35-day dataset examined the associations between pornography use and couple outcomes (Vaillancourt-Morel, Rosen, Willoughby, Leonhardt, & Bergeron, 2020). The data and materials used in the current study can be obtained at https://osf.io/3j5vx/?view_only=9d694cffaaef489eb2905cdccfae284b. All procedures were approved by the Université de Montréal and Dalhousie University's Institutional Review Boards. For the background survey, eligible couples independently accessed a unique hyperlink to complete a consent form and a series of self-report questionnaires hosted on Qualtrics. When both partners had completed the background survey, they were contacted to set a start date for the daily diaries. Every day, each partner accessed a unique hyperlink received via email each evening to complete a brief survey for 35 consecutive days. The complete survey included measures of emotions, conflicts with the partner, relationship satisfaction, relational intimacy, sexual desire, sexual distress, solitary sexual activity, and pornography use, which were completed each day for 35 days as well as measures of sexual function, sexual satisfaction, sexual intimacy, sexual motivation, sexual behaviors, positive and negative sexual cues, sexual talk, and perceived partner responsiveness to sexual talk which were completed on days of partnered sexual activity. For the background survey, each partner received a $10 CAD gift card. For the daily diaries, each partner received a maximum of $50 CAD.

On average, participants filled out 30.26 out of 35 possible daily surveys, for a completion rate of 86.5%. In this study, we included days where one partner reported sexual activity with their current partner within the last 24 hours or since they last completed a diary. However, our survey did not allow to determine if the pornography use occurred before or after

partnered sexual activity that day. Sexual activity included fondling, caressing, foreplay, vaginal penetration, anal penetration, manual stimulation, and oral sex. Of the 13,134 individual diary entries completed, 2,996 included sexual activity with the partner, with 2,492 (83.2%) being reported by both partners, 174 (5.8%) where one partner reported sexual activity with the partner that day and the other partner did not complete the diary that day, and 330 (11.0%) where one partner reported sexual activity with the partner that day, but the other partner reported no sexual activity. Thus, even if partners' reports of sexual activity were highly correlated ($r = .85$, $p < .001$), on some days there was a discrepancy, which is in line with daily reports of past studies (r = .88; Schoenfeld, Loving, Pope, Huston, & Štulhofer, 2017). Same-day diaries between partners were matched to form 1750 sex days (i.e., at least one partner reported sexual activity with their current partner). The 211 couples engaged in sexual activity 8.29 (SD = 5.08) days, ranging from 1 to 26 days.

Measures

Demographic variables. Biological sex, age, cultural identity, number of years of schooling, personal annual income, sexual orientation, relationship status, relationship duration, and number of children were assessed in the background survey. Sex was effect coded (women = -1, men = 1) to facilitate the interpretation of conditional main effects.

Pornography use. Each day, participants reported if they used pornography in the last 24 hours or since they last completed a diary which was coded as 0 = no pornography use and 1 = pornography use. Pornography use was defined as intentionally looking at or listening to (1) pictures or videos of nude individuals, (2) pictures of videos in which people are having sexual activities, or (3) written or audio material that describes people having sexual activities (Kohut et al., 2017). If they reported pornography use, participants indicated if they used pornography with

their partner (yes or no) which was used to create two variables: (1) solitary pornography use coded 0 = no pornography use alone and 1 = pornography use alone and (2) dyadic pornography use coded 0 = no pornography use with the partner and 1 = pornography use with the partner.

Sexual satisfaction. On days when participants reported a partnered sexual activity, the Global Measure of Sexual Satisfaction (Lawrance, Byers, & Cohen, 2019) was used to evaluate participants' subjective global satisfaction with this sexual activity. This measure includes five items rated on seven-point bipolar scales. Total scores range from 5 to 35, with higher scores indicating greater sexual satisfaction. This scale has good internal consistency and construct validity (Lawrance et al., 2019). In the present study, Cronbach's alpha was .95.

Sexual distress. On days when participants reported partnered sexual activity, the Female Sexual Distress Scale-Revised, also validated in men and used in prior daily research (DeRogatis, Clayton, Lewis-D'Agostino, Wunderlich, & Fu, 2008; Muise, Bergeron, Impett, Delisle, & Rosen, 2018; Santos-Iglesias, Mohamed, Danko, & Walker, 2018), was used to assess participant's level of sexual distress. Muise et al. (2018) selected the three face valid items with high factor loadings from the original scale to create the adaptation for daily diaries. Participants rated these three items on a five-point Likert scale (0 = *never*, 4 = *always*) how often during the past 24 hours they felt (1) distressed about their sex life, (2) inferior because of sexual problems, and (3) worried about sex. Total scores range from 0 to 12, with higher scores indicating greater sexual distress. In the present study, Cronbach's alpha was .90.

Sexual function. On days participants reported partnered sexual activity, the Monash Female Sexual Satisfaction Questionnaire and its adaptation for men (Davison, Bell, La China, Holden, & Davis, 2008; Rosen et al., 2014) was used to assess sexual function. This measure includes 12 items referring to sexual desire/receptivity, ease of arousal or erection, quality of

lubrication or erection, orgasmic function, and degree of pleasure. Total scores range from 5 to 54, with higher scores indicating better sexual function. This scale has good internal consistency and construct validity (Davison et al., 2008). In the present study, Cronbach's alpha was .83.

Masturbation. Participants were asked if they had sexual activity alone that included masturbation within the last 24 hours or since they last completed a diary. This item was coded as 0 = no masturbation today and 1 = masturbation today.

Data Analyses

Descriptive analyses and bivariate correlations were computed using SPSS 26.0 and multilevel analyses were performed using M*plus* 8.3 (Muthén & Muthén, 1998-2017). Following Laurenceau and Bolger's (2012) recommendations, we used the multilevel model for dyadic diary data which is a two-level model with days nested directly in couples and both partners' scores modeled simultaneously as multivariate outcomes. Dyadic nonindependence was modeled by covariances of the partners between couple random effects and daily within couple residual covariation (Laurenceau & Bolger, 2012). We adapted this model to indistinguishable dyads by constraining both partners to be equal, as suggested in other statistical models with indistinguishable dyads (Kashy, Donnellan, Burt, & McGue, 2008; West, 2013). Thus, daily reports (Level 1; within couples/individuals) were considered as nested within couples (Level 2; between couples/individuals), with each partner being randomly assigned to "partner 1" and "partner 2" and equality constraints on all parameters between partners. The actor-partner interdependence model (APIM; Kenny, Kashy, & Cook, 2006) guided the analyses as we tested both actor effects (e.g., association between one's own pornography use and own sexual satisfaction) and partner effects (e.g., association between partner pornography use and own sexual satisfaction). As partners were indistinguishable, there was just one intercept, one slope

for each actor effect, and one slope for each partner effect. A random intercept was estimated in each model and random slope effects were estimated for the actor and partner effects of pornography use including solitary and dyadic use (random slopes were not estimated for Level 1 covariates, i.e., masturbation). On Level 2, all random effects were allowed to covary. As Level 1 predictors (i.e., pornography use, masturbation) were binary variables, they were dummy coded and can be interpreted, for example, as the difference in the outcome between sex days without pornography use and those with pornography use. To examine differences between men and women, cross-level interactions between the actor and the partner associations and the user's sex were added in each model. Sex was effect coded (women = -1, men = 1) to facilitate the interpretation of conditional main effects. When an interaction term was significant, simple slope tests were used. All multilevel analyses were performed with the maximum likelihood method for parameter estimation (ML). Missing data, ranging from 0.1% for sexual distress to 9.7% for sexual function, were handled using the full information maximum likelihood estimation method (FIML). However, for the APIM, data were only included for days where both partners completed the question on pornography use (1576 out of 1750 sex days/couple). To reduce the risk of type I errors in our main analyses (i.e., the association between pornography use and sexual satisfaction, distress, and function on days of sexual activity), a Bonferroni correction was applied (α =.05; m = 3). Consequently, in these models, an association was considered significant at the level of $p < .017$. Given the post-hoc models for the distinct components of sexual function were exploratory, $p < .05$ was retained for these analyses.

Results

Descriptive Analyses

Table 1 presents the means, standard deviations, and bivariate correlations of all daily measures aggregated within-person across all sex days. Intraclass correlation coefficients (ICC) for each outcome are also reported in Table 1 and represent the percentage of variance that was accounted for by between-person differences relative to total variability. The ICC values can be subtracted from 1 to calculate that within-person differences (measurement across days) accounted for 48% of the variance in sexual satisfaction, 37% in sexual distress, and 51% in sexual function.

At the aggregate level, pornography use, alone or with the partner, and masturbation were unrelated to participants' own and their partner's sexual satisfaction, distress, and function. In 51.2% ($n = 108/211$) of couples, at least one member of the couple reported that they used pornography on the same day that they had sexual activity with their partner during the 35-day period, for a total of 40.3% ($n = 170/422$) of participants reporting use on sex days, with significantly more men (54.9%; $n = 96/175$) than women (30.0%; $n = 74/247$), $\chi^2(1) = 26.07$, $p < .001$, Cramer's V = .25. A total of 33.9% of participants ($n = 143/422$) reported using pornography alone on sex days, with significantly more men (49.7%; $n = 87/175$) than women (22.7%; $n = 56/247$), $\chi^2(1) = 33.11$, $p < .001$, Cramer's V = .28. A total of 13.3% of couples ($n = 28/211$) reported using pornography with their partner on sex days. At the daily level, 13.4% ($n = 447$) of sex days included pornography and 13.6% ($n = 452$) of sex days included solo-masturbation. Of these 447 sex days combined with pornography use, 76.3% included masturbation ($n = 341$) and 26.6% were a dyadic use ($n = 119$).

Preliminary correlations were conducted between aggregated sexual outcomes and sociodemographic variables (i.e., sex, age, being in a same- versus a mixed-sex relationship, cultural identity, years of education, annual income, relationship length, relationship status,

number of children) to examine the need to control for some of these covariates. Only an individual's sex ($r = -.39$, $p < .001$) was associated with sexual function at $r > .30$ and was added as a covariate in its respective model.

Daily Associations Between Pornography Use and Sexual Satisfaction

The associations between an individual's pornography use and their own and their partner's sexual satisfaction on days of sexual activity did not differ according to the user's sex as the cross-level interaction for the actor, b = -0.03, SE = 0.26, $p = 906$, and the partner associations, b = 0.02, SE = 0.26, $p = .929$, were nonsignificant. Results are presented in Table 2 and showed that when an individual used pornography on sex days, compared to sex days without pornography use, it was unrelated to their own and their partner's sexual satisfaction. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to participants' own and their partners' sexual satisfaction. Both solitary and dyadic use were unrelated to participants' own and their partners' sexual satisfaction.

Daily Associations Between Pornography Use and Sexual Distress

The associations between an individual's pornography use and their own and their partner's sexual distress on days of sexual activity also did not differ according to the user's sex as the cross-level interaction for the actor, b = 0.05, SE = 0.09, $p = .594$, and the partner associations, b = -0.10, SE = 0.09, $p = .290$, were nonsignificant. Results are presented in Table 3 and showed that when an individual used pornography on sex days, compared to sex days when the individual did not use pornography, it was unrelated to their own sexual distress, but their partner had higher sexual distress. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to participants' own and their

partners' sexual distress. On sex days when an individual used pornography alone, compared to sex days when they did not use pornography alone, it was unrelated to their own sexual distress, but was associated with their partner's higher sexual distress. When a couple used pornography together on sex days, it was unrelated to their sexual distress.

Daily Associations Between Pornography Use and Sexual Function

The associations between an individual's pornography use and their own and their partner's sexual function on days of sexual activity again did not differ according to the user's sex as the cross-level interaction for the actor association, $b = -0.92$, SE $= 0.53$, $p = .081$, and the partner association, $b = -0.81$, SE $= 0.58$, $p = .164$, were nonsignificant. Results are presented in Table 4 and showed that on sex days when an individual used pornography, compared to sex days when the individual did not, it was unrelated to their own and their partner's sexual function. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to their own or their partner's sexual function. Both solitary and dyadic use were unrelated to participants' own and their partners' sexual function.

Daily Associations Between Pornography Use and Distinct Components of Sexual Function

To better understand the associations between pornography use and sexual function on days of partnered sexual activity, post-hoc exploratory analyses were also pursued in subsequent models to examine separately the associations between an individual's pornography use and the five subscales of participants' own and their partners' sexual function.

The associations with sexual desire/receptivity did not differ according to the user's sex as the cross-level interaction for the actor association, $b = -0.03$, SE $= 0.09$, $p = .762$, and for the partner association, $b = -0.06$, SE $= 0.10$, $p = .565$, were nonsignificant. Results presented in Table 5 showed that on sex days when an individual used pornography, compared to sex days

when the individual did not, it was unrelated to their own sexual receptivity, but their partner had lower sexual receptivity. Adding actor and partner masturbation the partner association became nonsignificant, as an individual's pornography use and masturbation were unrelated to their own and their partner's sexual receptivity. On sex days when an individual used pornography alone, compared to sex days when they did not use pornography alone, it was unrelated to their own sexual receptivity, but their partner had lower sexual receptivity. Dyadic pornography use on sex days was unrelated to sexual receptivity.

The associations with ease of arousal or erection did not differ according to the user's sex as the cross-level interaction for the actor association, b = -0.13, SE = 0.10, p = .201, and for the partner association, b = -0.14, SE = 0.11, p = .191, were nonsignificant. Results presented in Table 6 showed that on sex days when an individual used pornography, compared to sex days when the individual did not, it was unrelated to their own and their partner's ease of arousal or erection. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to participants' own and their partners' ease of arousal or erection. Both solitary and dyadic use were unrelated to participants' own and their partners' ease of arousal or erection.

The associations with quality of lubrication or erection differed significantly according to the user's sex as the cross-level interaction was significant for the actor association, b = -0.23, SE = 0.11, p = .034, but not for the partner association, b = -0.17, SE = 0.13, p = .179 (the cross-level interaction for the partner association was removed from the final model). Results presented in Table 7 showed that on sex days when a woman used pornography, it was positively related to her own quality of lubrication, whereas when men used, it was unrelated to their own quality of erection. When women and men used pornography on sex days, it was unrelated to

their partners' quality of lubrication or erection. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to participants' own and their partners' quality of lubrication or erection. On sex days when a woman used pornography alone, compared to sex days when she did not use pornography alone, it was positively related to her own quality of lubrication, whereas when men used alone, it was unrelated to their own quality of erection. Women and men's solitary pornography use were unrelated to their partner's quality of lubrication or erection. When a couple used pornography together on sex days, it was unrelated to their quality of lubrication or erection.

The associations with orgasmic function did not differ according to the user's sex as the cross-level interaction for the actor association, b = -0.40, SE = 0.21, p = .065, and for the partner association, b = -0.23, SE = 0.22, p = .287, were nonsignificant. Results presented in Table 8 showed that on sex days when an individual used pornography, compared to sex days when the individual did not, it was unrelated to their own and their partner's orgasmic function. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to participants' own and their partners' orgasmic function. Both solitary and dyadic use were unrelated to participants' own and their partners' orgasmic function.

The associations with degree of pleasure did not differ according to the user's sex as the cross-level interaction for the actor association, b = -0.08, SE = 0.10, p = .454, and for the partner association, b = -0.07, SE = 0.11, p = .514, were nonsignificant. Results presented in Table 9 showed that on sex days when an individual used pornography, compared to sex days when the individual did not, it was unrelated to their own and their partner's degree of pleasure. Adding actor and partner masturbation did not change the significance of these associations and masturbation was unrelated to participants' own and their partners' degree of pleasure. Both

solitary and dyadic use were unrelated to participants' own and their partners' degree of pleasure.

Discussion

In Western culture, pornography use is increasingly common. In the present study, half of the 211 participating North American couples reported using pornography on the same day that they engaged in partnered sexual activity, over a 35-day period. Our findings suggest no evidence of an association between pornography use on days of sexual activity with the partner, whether alone or with the partner, and most aspects of sexual health, as defined in the current study. However, an individual's solitary pornography use on sex days was related to their partner's higher sexual distress and, for women' use, to their own higher quality of lubrication on that day.

Given current societal concerns around pornography use, null findings are important to emphasize. We found no evidence that having used pornography on days of sexual activity– relative to sex days without–was significantly related to the user or their partner's sexual satisfaction, ease of arousal/erection, orgasmic function, and degree of pleasure. Significance tests also suggest that it was unrelated to the user's sexual distress, the user's sexual receptivity, their partner's quality of lubrication or erection and, for men's use, the user's quality of erection. These associations controlled for the effect of masturbation and were nonsignificant regardless of whether pornography use occurred alone or with the partner. Thus, our findings suggest that using pornography on days of partnered sexual activity does not appear to affect relevant aspects of sexual health, including satisfaction with partnered sexual activity and men's quality of erection during partnered sex. Most of our findings contrast with theoretical formulations positing that pornography leads users to find less arousal and satisfaction in partnered sexual

activity (Hoffmann et al., 2004; Miller et al., 2017), which was also found in a handful of cross-sectional studies (Blais-Lecours et al., 2016; Wright et al., 2017). However, they are in line with those of most cross-sectional and longitudinal work indicating that pornography use was not associated with sexual satisfaction, erectile function, and orgasmic function (Bridges & Morokoff, 2011; Grubbs & Gola, 2019; Landripet & Štulhofer, 2015; Muusses, Kerkhof, & Finkenauer, 2015; Prause & Pfaus, 2015). Differential findings may be explained by study designs, as the negative association reported in some studies using retrospective reports may not be noticeable shortly after viewing pornography once, on the same day, but perhaps a small cumulative effect is being picked up over time with repetitive use. Indeed, as suggested by Leonhardt, Spencer, Butler, and Theobald (2019), it is plausible that motivations for using pornography (e.g., pleasure, novelty) differentially influence short- and long-term sexual quality, as it would favor short-term sexual quality (e.g., arousal, openness). This study specifically examined the associations between pornography use and the quality of partnered sexual activity on days of couple sexual activity. As such, our findings do not reflect what transpires on days without partnered sexual activity. Thus, based on within-day associations, it seems implausible that, at least in the short-term, on days of partnered sexual activity, pornography leads users to contrast their sexual experience or performance with what they have seen in pornography, or that if they do so, it does not negatively affect their partnered sexual experience that day.

Nevertheless, an individual's solitary pornography use on days of partnered sexual activity was associated with their partner's higher sexual distress. Past qualitative studies among samples of women partnered with men who use pornography indicated that the women reported feeling sexually inadequate, undesirable and objectified, i.e., not good enough to satisfy their partner (Bergner & Bridges, 2002; Bridges, Bergner, & Hesson-McInnis, 2003; Tylka & Kroon

Van Diest, 2014). Our study extends these results by showing that these partner associations involved both men and women's use when pornography was used alone on the same day that partnered sexual activity occurred. Paired with the qualitative reports, one possible interpretation of this finding is that an individual' solitary pornography use on days of partnered sexual activity would lead the partner to feel inferior, sexually inadequate, and worried that their sex life is not good enough, as the partner might be aware of the solitary pornography use (Bridges et al., 2003; Tylka & Kroon Van Diest, 2014). The partner may also be distressed in reaction to the user acting differently or being less engaged during partnered sexual activity, being less connected with, or interested in their partner, as the pornography use occurred on the same day (e.g., acting like in a pornographic scene; Bergner & Bridges, 2002; Sun et al., 2016). As we cannot confirm that pornography use occurred before the partnered sexual activity, another plausible explanation is that an individual's higher level of sexual distress may lead the partner to use pornography alone after they had a partnered sexual activity. As greater sexual distress is related to higher levels of anxiety and depression for the partner (Glowacka, Bergeron, Delisle, & Rosen, 2019), if pornography use occurred after the partnered sexual activity, it could represent an attempt to cope with these negative emotions.

On the other hand, on days of partnered sexual activity, women's solitary pornography use was associated with their own higher quality of lubrication during same day partnered sexual activity. Women are rarely included in quantitative studies examining the pornography–sexual function association (Grubbs & Gola, 2019; Landripet & Štulhofer, 2015; Prause & Pfaus, 2015). However, this result is in line with past findings showing that pornography use was related to a greater open erotic climate in couples, in which it was easier to talk about sexual desires and fantasies (Daneback, Træen, & Månsson, 2009). In responses to open-ended questions, 75

responses referred to how solitary pornography use increased arousal response during sexual activity (Kohut et al., 2017). Women's pornography use may improve and normalize sexual fantasies, thus rendering them more responsive during partnered sexual activity. Within romantic relationships, it may also facilitate sexual communication and expression. Even if this explanation is consistent with results of past studies, it may also be that when women were more physically responsive during partnered sexual activity, they were more likely to use pornography alone after this sexual activity as they may still be excited and want to continue to satisfy their sexual needs. This association was not better explained by masturbation, suggesting that it is the effect of viewing a sexual or erotic script that is associated with higher levels of arousal in women, rather than masturbation.

About three quarters of pornography use on days of sexual activity was accompanied by masturbation, which emphasizes the need to control for this covariate, as stated in previous criticisms (Prause, 2019). We found no evidence that masturbation was associated with indicators of sexual health, but the significant association between an individual's solitary pornography use and their partner's lower sexual receptivity was no longer significant when masturbation was accounted for. This association could in fact be bidirectional; on sex days, when an individual used pornography and then initiated sexual activity, their partner received less favorably their sexual initiative, even if partnered sexual activity occurred that day; or on sex days, they used pornography alone because their partner was less receptive to their sexual initiative (but they still had a partnered sexual activity that day). Regardless of the causal direction, this association was not about pornography use per se, but rather was accounted for by masturbation, which is in line with Perry's (2020) findings, whereby they controlled for masturbation and lost significant associations between pornography use and relational happiness.

Only one quarter of pornography use on sex days occurred with the partner, and these dyadic uses were not significantly related to either partners' sexual health. These results are at odds with past studies which mostly suggested that dyadic use was related to positive outcomes, such as higher levels of sexual satisfaction and openness of sexual communication (Kohut et al., 2018; Willoughby & Leonhardt, 2020). Our results extend those of previous studies, as we examined within-couple associations; using pornography with your partner on sex days was unrelated to sexual health outcomes when compared to sex days without use, rather than compared to couples who are not using pornography. This distinction may explain the divergent findings.

Strengths and Limitations

The validity of our results is reinforced by the external validity of an event-level design capturing couples' sexual interactions in their natural environment. However, findings should not be confounded with those of past studies showing that frequent or problematic pornography use is related to negative outcomes. Moreover, we specifically examined associations between pornography use and sexual health on days of partnered sexual activity, such that we cannot speak to the associations between pornography use and sexual or relationship indicators on days without partnered sexual activity. The sexual indicators in this study were specifically related to the sexual activity that occurred in the last 24 hours, thus they were not completed on days without sexual activity. Even if event-level diaries have many strengths, including reducing the likelihood of retrospective bias, they preclude any directional assumptions between pornography use and sexual health, as temporal sequence within days was not assessed. Thus, we do not know if pornography use occurred before or after partnered sexual activity. To answer our main objective, we examined three sexual outcomes in separate models, adding sex as a moderator,

masturbation as a covariate, and dividing daily pornography use into solitary and dyadic use. A correction was applied to control for the three models used, but for the following models that examined the five subscales of sexual function separately, no adjustments for multiple testing were applied as these were exploratory. Moreover, even if we have been transparent about which analyses were exploratory, our hypotheses were not pre-registered, which lowers the strength of the inferences that can be drawn from this study. Thus, findings should be replicated in future studies including pre-registration of hypotheses and analyses. The generalizability of the results is limited by our convenience sample composed of sexually active couples, in which a self-selection bias may have occurred. Because differences in culture, race, or ethnicity could influence patterns of pornography use (Rowland & Uribe, 2020), the limited cultural diversity of this Caucasian sample restricts the generalizability of our findings to Western couples. Even though we examined the associations with both solitary and dyadic pornography use, future studies should investigate associations with specific pornographic materials and with other specific contexts of use. Finally, even if we controlled for masturbation, other important covariates such as religiosity or partners' moral beliefs were not considered in this study but should be in future work.

Conclusion

Overall, results do not support public health concerns about pornography use and its role in sexual dissatisfaction and sexual dysfunction (Nelson & Rothman, 2020). Indeed, our findings provide evidence supporting that pornography use on days of sexual activity, whether alone or with the partner, was not associated with most aspects of sexual health, compared to days of sexual activity without pornography use. However, solitary pornography use on sex days was related to partners' higher sexual distress and, for women's solitary use, to their own greater

arousal response. These mixed results, which are in line with past findings, point toward the

importance of additional research examining the conditions under which pornography use may

be associated with a variety of sexual health outcomes in romantic relationships.

Table 1.

Descriptive Statistics and Within-Person Correlations Among Aggregated Daily Variables.

	M (*SD*)	Range	ICC	1.	2.	3.	4.	5.	6.	7.
1. Pornography use	1.06 (1.97)	0 - 13		**.42*****	.82***	.81***	.62***	.04	-.04	.08
2. Masturbation	1.07 (1.91)	0 - 12		.33***	**.38*****	.75***	.38***	-.03	-.01	.03
3. Solitary pornography use	0.78 (1.54)	0 - 9		.13**	.19***	**.15****	.07	-.01	-.04	.08
4. Dyadic pornography use	0.36 (1.37)	0 - 10		-	-	-	-	.08	-.03	.01
5. Sexual satisfaction	30.69 (4.29)	6 - 35	0.52	-.01	-.02	-.06	-	**.38*****	-.31***	.50***
6. Sexual distress	1.03 (1.67)	0 - 10.43	0.63	-.02	.01	-.02	-	-.21	**.21*****	-.34***
7. Sexual function	43.85 (7.31)	12 - 54	0.41	-.04	-.03	-.05	-	.23***	-.19***	**.05**

Note. ICC = intraclass correlation coefficient which represents the amount of between-individual variability relative to total

variability. Correlations above the diagonal are between each of the actor variables and correlations along (in bold) and below the

diagonal are between the actor and partner variables.

**$p < .010$. ***$p < .001$.

Table 2.

Daily Associations Between Actor and Partner Pornography Use and Sexual Satisfaction on

Days of Sexual Activity.

Fixed effects	Sexual satisfaction				
	Estimate (SE)	Z	*p-value*	95% *CI*	
				Lower	Upper
Model 1					
Intercept	30.77 (0.25)	123.49	< .001	30.28	31.26
Actor pornography use	-0.07 (0.26)	-0.27	.786	-0.58	0.44
Partner pornography use	0.01 (0.26)	0.02	.986	-0.51	0.52
Model 2					
Intercept	30.78 (0.25)	122.95	< .001*	30.29	31.27
Actor pornography use	-0.29 (0.35)	-0.83	.410	-0.97	0.40
Partner pornography use	0.41 (0.36)	1.14	.253	-0.29	1.11
Actor masturbation	0.28 (0.34)	0.84	.401	-0.38	0.94
Partner masturbation	-0.53 (0.35)	-1.52	.128	-1.22	0.15
Model 3					
Intercept	30.77 (0.25)	124.22	< .001*	30.28	31.25
Actor solitary pornography use	-0.23 (0.28)	-0.81	.419	-0.78	0.32
Partner solitary pornography use	-0.10 (0.30)	-0.33	.745	-0.69	0.49
Dyadic pornography use	0.76 (0.54)	1.41	.160	-0.30	1.81

Note. Estimates are unstandardized regression coefficients. *Significant at *p* < .017.

Table 3.

Daily Associations Between Actor and Partner Pornography Use and Sexual Distress on Days of

Sexual Activity.

	Sexual distress				
Fixed effects	Estimate (SE)	Z	*p-value*	95% *CI*	
Model 1				Lower	Upper
Intercept	0.97 (0.09)	11.03	< .001*	0.80	1.14
Actor pornography use	0.08 (0.08)	1.07	.285	-0.07	0.24
Partner pornography use	0.22 (0.08)	2.69	.007*	0.06	0.38
Model 2					
Intercept	0.97 (0.09)	11.03	< .001	0.80	1.14
Actor pornography use	0.10 (0.11)	0.93	.353	-0.11	0.30
Partner pornography use	0.27 (0.11)	2.50	.012*	0.06	0.48
Actor masturbation	-0.03 (0.10)	-0.25	.804	-0.22	0.17
Partner masturbation	-0.07 (0.10)	-0.72	.472	-0.27	0.13
Model 3					
Intercept	0.97 (0.09)	10.97	< .001*	0.80	1.15
Actor solitary pornography use	0.13 (0.08)	1.55	.121	-0.03	0.28
Partner solitary pornography use	0.28 (0.10)	2.72	.007*	0.08	0.49
Dyadic pornography use	0.02 (0.18)	0.14	.891	-0.32	0.37

Note. Estimates are unstandardized regression coefficients. *Significant at *p* < .017.

Table 4.

Daily Associations Between Actor and Partner Pornography Use and Sexual Function on Days

of Sexual Activity.

Fixed effects	Sexual function			95% *CI*	
Model 1	Estimate (SE)	Z	*p-value*	Lower	Upper
Intercept	44.27 (0.38)	116.23	< .001*	43.52	45.01
Actor pornography use	0.18 (0.50)	0.36	.721	-0.80	1.15
Partner pornography use	0.08 (0.57)	0.15	.884	-1.03	1.19
Model 2					
Intercept	44.31 (0.38)	115.36	< .001*	43.56	45.07
Actor pornography use	0.01 (0.70)	0.01	.993	-1.36	1.37
Partner pornography use	1.11 (0.76)	1.46	.144	-0.38	2.60
Actor masturbation	0.15 (0.68)	0.22	.825	-1.18	1.48
Partner masturbation	-1.35 (0.72)	-1.87	.061	-2.76	0.06
Model 3					
Intercept	44.28 (0.38)	116.35	< .001*	43.53	45.02
Actor solitary pornography use	-0.09 (0.61)	-0.15	.879	-1.29	1.10
Partner solitary pornography use	0.07 (0.63)	0.11	.913	-1.17	1.31
Dyadic pornography use	0.94 (1.31)	0.72	.471	-1.62	3.51

Note. Estimates are unstandardized regression coefficients. *Significant at $p < .017$. Actor sex

was included as a level-2 covariate.

Table 5.

 Daily Associations Between Actor and Partner Pornography Use and Sexual Receptivity on

Days of Sexual Activity.

Fixed effects	Sexual receptivity				
	Estimate (SE)	Z	*p-value*	95% *CI*	
Model 1				Lower	Upper
Intercept	8.48 (0.04)	228.74	< .001*	8.40	8.55
Actor pornography use	0.13 (0.08)	1.61	.107	-0.03	0.29
Partner pornography use	-0.25 (0.10)	-2.62	.009*	-0.44	-0.06
Model 2					
Intercept	8.48 (0.04)	225.02	< .001*	8.41	8.55
Actor pornography use	0.10 (0.11)	0.84	.401	-0.13	0.32
Partner pornography use	-0.15 (0.13)	-1.17	.242	-0.41	0.10
Actor masturbation	0.04 (0.10)	0.41	.684	-0.16	0.25
Partner masturbation	-0.13 (0.11)	-1.17	.244	-0.35	0.09
Model 3					
Intercept	8.47 (0.04)	228.43	< .001*	8.40	8.55
Actor solitary pornography use	0.10 (0.09)	1.21	.227	-0.07	0.27
Partner solitary pornography use	-0.25 (0.11)	-2.36	.018*	-0.46	-0.04
Dyadic pornography use	-0.03 (0.13)	-0.27	.790	-0.28	0.22

Note. Estimates are unstandardized regression coefficients. *Significant at $p < .05$. Actor sex was

included as a level-2 covariate.

Table 6.

Daily Associations Between Actor and Partner Pornography Use and Ease of Arousal or

Erection on Days of Sexual Activity.

Fixed effects	Ease of arousal or erection				
	Estimate (SE)	Z	*p-value*	95% *CI*	
Model 1				Lower	Upper
Intercept	7.68 (0.07)	110.11	$< .001*$	7.54	7.82
Actor pornography use	0.09 (0.10)	0.93	.354	-0.10	0.29
Partner pornography use	-0.10 (0.11)	-0.99	.324	-0.31	0.10
Model 2					
Intercept	7.68 (0.07)	109.11	$< .001*$	7.55	7.82
Actor pornography use	0.08 (0.14)	0.62	.536	-0.18	0.35
Partner pornography use	-0.03 (0.15)	-0.20	.842	-0.31	0.26
Actor masturbation	0.003 (0.13)	0.02	.984	-0.26	0.26
Partner masturbation	-0.10 (0.14)	-0.74	.462	-0.38	0.17
Model 3					
Intercept	7.67 (0.07)	110.38	$< .001*$	7.53	7.81
Actor solitary pornography use	0.08 (0.12)	0.66	.510	-0.15	0.31
Partner solitary pornography use	-0.07 (0.13)	-0.54	.589	-0.31	0.18
Dyadic pornography use	0.07 (0.26)	0.26	.793	-0.43	0.57

Note. Estimates are unstandardized regression coefficients. *Significant at $p < .05$. Actor sex was

included as a level-2 covariate.

Table 7.

Daily Associations Between Actor and Partner Pornography Use and Daily Quality of

Lubrication or Erection on Days of Sexual Activity.

	Quality of lubrification or erection				
Fixed effects	Estimate (SE)	Z	*p-value*	95% *CI*	
Model 1				Lower	Upper
Intercept	7.47 (0.08)	97.19	< .001*	7.32	7.62
Actor pornography use	0.19 (0.11)	1.75	.080	-0.02	0.41
Partner pornography use	0.01 (0.12)	0.11	.916	-0.23	0.25
Simple slope tests					
Women's actor pornography use	0.45 (0.17)	2.64	.008*	0.12	0.79
Men's actor pornography use	-0.07 (0.14)	-0.49	.624	-0.34	0.20
Model 2					
Intercept	7.48 (0.08)	96.65	< .001*	7.33	7.64
Actor pornography use	0.22 (0.15)	1.43	.153	-0.08	0.52
Partner pornography use	0.19 (0.17)	1.12	.263	-0.14	0.51
Actor masturbation	-0.05 (0.14)	-0.36	.723	-0.33	0.23
Partner masturbation	-0.24 (0.15)	-1.56	.120	-0.53	0.06
Simple slope tests					
Women's actor pornography use	0.48 (0.20)	2.42	.016*	0.09	0.86
Men's actor pornography use	-0.04 (0.18)	-0.22	.824	-0.39	0.31
Model 3					
Intercept	7.47 (0.08)	96.96	< .001*	7.32	7.62
Actor solitary pornography use	0.16 (0.12)	1.32	.187	-0.08	0.41
Partner solitary pornography use	0.07 (0.13)	0.56	.576	-0.18	0.32
Dyadic pornography use	0.22 (0.30)	0.74	.459	-0.37	0.82
Simple slope tests					
Women's actor pornography use	0.39 (0.19)	2.01	.044*	0.01	0.76
Men's actor pornography use	-0.06 (0.15)	-0.39	.694	-0.36	0.24

Note. Estimates are unstandardized regression coefficients. *Significant at $p < .05$. Actor sex was

included as a level-2 covariate.

Table 8.

Daily Associations Between Actor and Partner Pornography Use and Orgasmic function on

Days of Sexual Activity.

Fixed effects	Orgasmic function				
	Estimate (SE)	Z	*p-value*	95% *CI*	
Model 1				Lower	Upper
Intercept	5.76 (0.14)	42.39	< .001*	5.49	6.03
Actor pornography use	-0.11 (0.21)	-0.53	.599	-0.52	0.30
Partner pornography use	0.13 (0.21)	0.62	.534	-0.28	0.53
Model 2					
Intercept	5.77 (0.14)	42.08	< .001*	5.50	6.04
Actor pornography use	-0.20 (0.28)	-0.72	.472	-0.74	0.34
Partner pornography use	0.42 (0.28)	1.47	.141	-0.14	0.98
Actor masturbation	0.10 (0.25)	0.40	.687	-0.40	0.60
Partner masturbation	-0.39 (0.27)	-1.47	.142	-0.91	0.13
Model 3					
Intercept	5.78 (0.14)	42.56	< .001*	5.52	6.05
Actor solitary pornography use	-0.27 (0.23)	-1.17	.242	-0.71	0.18
Partner solitary pornography use	0.07 (0.22)	0.33	.740	-0.36	0.51
Dyadic pornography use	0.22 (0.41)	0.54	.588	-0.58	1.03

Note. Estimates are unstandardized regression coefficients. *Significant at $p < .05$. Actor sex was

included as a level-2 covariate.

Table 9.

Daily Associations Between Actor and Partner Pornography Use and Degree of Pleasure on

Days of Sexual Activity.

Fixed effects	Degree of pleasure			95% *CI*	
Model 1	Estimate (SE)	Z	*p-value*	Lower	Upper
Intercept	7.42 (0.07)	107.92	< .001*	7.29	7.56
Actor pornography use	-0.004 (0.10)	-0.04	.966	-0.19	0.18
Partner pornography use	-0.02 (0.11)	0.18	.861	-0.19	0.22
Model 2					
Intercept	7.43 (0.07)	107.21	< .001*	7.30	7.57
Actor pornography use	0.01 (0.13)	0.07	.941	-0.25	0.27
Partner pornography use	0.16 (0.14)	1.11	.268	-0.12	0.44
Actor masturbation	-0.03 (0.13)	-0.25	.802	-0.28	0.22
Partner masturbation	-0.19 (0.13)	-1.42	.156	-0.45	0.07
Model 3					
Intercept	7.43 (0.07)	106.94	< .001*	7.29	7.56
Actor solitary pornography use	-0.01 (0.11)	-0.12	.903	-0.23	0.21
Partner solitary pornography use	-0.01 (0.11)	-0.11	.909	-0.24	0.21
Dyadic pornography use	0.19 (0.25)	0.79	.433	-0.29	0.68

Note. Estimates are unstandardized regression coefficients. *Significant at $p < .05$. Actor sex was

included as a level-2 covariate.

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