Pornography use and romantic relationships: A dyadic daily diary study

Marie-Pier Vaillancourt-Morel[1] , Natalie O. Rosen[2],
Brian J. Willoughby[3], Nathan D. Leonhardt[4] ,
and Sophie Bergeron[5]

Abstract
Pornography use is now considered a normative sexual activity, including for partnered individuals. Although there are documented positive and negative effects of pornography use on romantic relationships, studies to date suffer from key limitations, narrowing their clinical relevance. Most rely on vague recall measurement that may inadequately capture actual pornography use, and all are exclusively based on mixed-sex couples. This study used a 35-day dyadic daily diary design to examine the associations between an individual's daily pornography use and their own and their partner's relationship satisfaction, partnered sexual desire, and probability of partnered sexual activity in mixed-sex and same-sex couples ($N = 217$ couples). For women, regardless of partner's sex, using pornography was associated with their own and their partner's higher sexual desire and with higher odds of partnered sexual activity. For men, regardless of partner's sex, using pornography was associated with their partner's lower sexual desire; for men coupled with women, with lower odds of partnered sexual activity, and for men coupled with men, with higher odds of partnered sexual activity. For all participants, pornography use was unrelated to relationship satisfaction. The current study demonstrated that an individual's pornography use is associated with same-day couple's sexual dynamics, with different associations according to users' and their partners' sex.

[1] Université du Québec à Trois-Rivières, Canada
[2] IWK Health Centre, Dalhousie University, Canada
[3] Brigham Young University, USA
[4] University of Toronto, Canada
[5] Université de Montréal, Canada

Corresponding author:
Marie-Pier Vaillancourt-Morel, Department of Psychology, Université du Québec à Trois-Rivières, Pavillon Michel-Sarrazin, 3600, rue Sainte-Marguerite, C.P. 500, Trois-Rivières, Québec G9A 5H7, Canada.
Email: marie-pier.vaillancourt-morel@uqtr.ca

Digital technologies have made viewing pornography a normative sexual activity, including for partnered individuals. Estimates of pornography use for those in heterosexual romantic relationships range from 71% to 92% for men and from 34% to 83% for women (Kohut et al., 2017; Willoughby et al., 2016). Compulsive or excessive pornography use is a common presenting problem in clinical settings that should be addressed unequivocally, as it has been associated with a host of negative outcomes for the user and their romantic relationship (Ayres & Haddock, 2009; Goldberg et al., 2008). However, assessing the effects of a partnered individual's recreational pornography use is not as straightforward. Indeed, despite clinical concerns that pornography use may be redefining couple sexuality and relationships (Goldberg et al., 2008; Park et al., 2016), empirical knowledge in this area remains fragmentary, with diverging results.

Correlational and experimental studies have assessed how pornography use is related to relationship satisfaction, as well as sexual desire for the romantic partner and the frequency of partnered sexual activity; these constructs are thought to adequately represent how pornography use may affect the relational and sexual interplay between partners (Leonhardt et al., 2019). However, research focusing on these important outcomes suffers from key methodological flaws, narrowing conclusions than can be drawn (Vaillancourt-Morel et al., 2019). Most rely on vague recall measurement that may inadequately capture actual pornography use, and all are exclusively based on mixed-sex couples. The present study addresses these limitations, as it focuses on the associations between pornography use and relationship satisfaction, partnered sexual desire, and partnered sexual activity at the daily level, among mixed-sex and same-sex couples.

Theoretical perspectives

In line with diverging results reported in past research, theoretical perspectives suggest how recreational pornography use may positively or negatively influence romantic relationships. Social comparison theory (Festinger, 1954) contends that pornography can negatively influence relationships by leading to unfavorable upward comparisons of the partner or the couple's sexuality to pornography. Excitation transfer theory (Zillmann et al., 1972) suggests that sexual arousal following pornography use may be transferred to the partner, leading to higher partnered sexual desire and activity. These theories may also be relevant for understanding how pornography use influences a partner. Specifically, pornography use may activate the partner's self-doubt, feelings of sexual objectification, and thus, diminish the partner's desire and relationship satisfaction; on the contrary, it may create an erotic climate that fosters the partner's desire and leads to partnered sexual activity.

Correlational studies using retrospective reports of pornography use

Although a handful of studies using retrospective reports have shown that pornography use is unrelated to relationship satisfaction (Veit et al., 2016), or even positively related to partnered sexual desire, particularly for women (Willoughby & Leonhardt, 2020), most studies have found a negative association between pornography use and various aspects of romantic relationships, including lower relationship satisfaction, lower sexual desire, and lower interest in partnered sex (Perry, 2020; Willoughby et al., 2016; Wright et al., 2017). Even if the majority of pornography research relies on non-dyadic samples, findings among heterosexual couples suggest that men's pornography use is associated with their female partner's lower relationship satisfaction and sexual desire (Kohut et al., 2018; Maas et al., 2018; Poulsen et al., 2013; Willoughby & Leonhardt, 2020). However, all correlational studies used single-occasion retrospective reports to assess the frequency of pornography use with varying time frames (e.g., in the last year, since the beginning of the relationship). This method is subject to recall biases—a significant problem considering individuals underestimate their media use (Kahn et al., 2014). The associations with frequency of use may also be biased toward high frequency or excessive use, which from a conceptual and clinical standpoint is distinct from recreational pornography use (Vaillancourt-Morel et al., 2017).

Experimental studies

Laboratory studies on pornography use—which hold the advantage of not confounding it with excessive use as only a single exposure is used—suggest, in contrast, that individuals who viewed attractive nude images or an erotic film in a controlled laboratory environment, compared to neutral materials, reported greater desire to be close to their partner. However, in multiple studies, no differences between viewing erotic and neutral materials were found in their relationship satisfaction, their love for the partner, and ratings of their partner's sexual attractiveness (Balzarini et al., 2017; Staley & Prause, 2013). None of these studies examined if viewing erotic materials had an effect on the partner.

Differential findings between retrospective reports and experimental use may be explained by the study design. Repetitive pornography use, as captured in studies using single-occasion retrospective reports, may not have the same effect as a single exposure in the laboratory. The experimental task also has the advantage of not confounding the effect of pornography use with its potential precursors, such as relationship problems (Daspe et al., 2018; Muusses et al., 2015). Nevertheless, exposing individuals to pornography in a laboratory setting is unlikely to reflect the naturalistic context in which it occurs, and its association with relationship and sexual dynamics in daily life. Research assessing deliberate pornography use at home may result in more accurate associations than participating in an experimental task.

Current study

By adopting a 35-day dyadic daily diary design, this study builds upon and extends research on pornography use in romantic relationships in four key ways: it integrates

daily associations, a dyadic perspective, same-sex couples, and lagged daily models. At-home daily reports provide a less biased assessment than retrospective reports, yielding higher ecological validity than laboratory studies. Repeated daily time points also allow for the testing of bidirectional associations, examining whether relationship problems and pornography use are mutually influential.

Studies using both retrospective reports or in-lab viewing generally suggest women's pornography use is associated with more positive relational outcomes than men's (Bridges & Morokoff, 2011; Muusses et al., 2015). However, all samples were mixed-sex couples, making it unclear whether these sex differences were due to the sex of the user or the sex of the partner. Men and women's experiences in relationships differ in part based on their own sex, and their partners' sex (Tornello et al., 2017). Perhaps gendered stereotypes depicted in pornography and different attitudes regarding pornography could play out differently depending on whether one's partner is a man or a woman (Carroll et al., 2017; Klaassen & Peter, 2015). For instance, men partnered with men may be less affected by the way women are portrayed in pornography.

We hypothesized that—for men coupled with women—using pornography would be associated on the same day with participants' own and their partner's lower relationship satisfaction, lower partnered sexual desire, and less partnered sexual activity. For women coupled with men, pornography use would be associated on the same day with their own and their partner's higher relationship satisfaction, higher partnered sexual desire, and more partnered sexual activity. For individuals in same-sex couples, no significant within-day associations between pornography use and their own and their partner's relationship outcomes were expected. Thus, we hypothesized that the interaction between users' sex and partners' sex, thus couple type, would significantly moderate associations with pornography use.

Method

Participants

A convenience sample of 217 couples was recruited between March 2017 and June 2018 through online advertisements (e.g., Kijiji, couples or sales Facebook groups), email lists (e.g., research center or research society email lists), as well as flyers distributed in various public locations in two large metropolitan Canadian cities. Advertisements informed potential participants about an online study on how sex and intimacy contribute to the well-being of couples. Mixed-sex and same-sex couples were included in the study; to ensure sufficient diversity in the sample, part of the study's recruitment targeted the LGBTQ+ community (e.g., posting on LGBTQ+ Facebook groups). Interested participants were contacted by a research assistant 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 3 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 about this study, 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, 5 (1.0%) failed two out of three attention-testing questions in the background survey, 1 (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 2 days, and 1 (0.2%) was excluded because of an error in data collection, resulting in a final sample of 217 couples (434 participants).

This sample included 256 women (59.0%), 177 men (40.8%), and 1 intersex (0.2%) who defined himself as a man. These individuals formed 77 same-sex couples (35.5%; 58 women–women and 19 men–men) and 140 mixed-sex couples (64.5%). Most participants (91.9%; $n = 399$) reported that their gender identity matched their sex assigned at birth with others trans-identified as men ($n = 8$) or as women ($n = 3$) as well as identified as agender ($n = 8$), or as "other" ($n = 16$; e.g., nonbinary, androgynous, gender fluid, queer). Participants ranged in age from 18 years to 70 years ($M = 30.39$, $SD = 8.47$). The majority of participants described their cultural identity as French Canadian (38.0%; $n = 165$) or English Canadian (36.9%; $n = 160$), followed by American (11.1%; $n = 48$), European (5.0%; $n = 22$), and a range of other cultural identities (9.0%; $n = 39$; First Nations, African, Asian, Middle Eastern, Latin American, Caribbean). On average, participants reported 16.71 years of education ($SD = 2.84$) which corresponds to a college undergraduate degree. Most participants reported an average annual personal income of less than Can\$40,000 (61.0%; $n = 265$); \$40,000–\$69,999 (27.9%; $n = 121$); and more than \$70,000 (11.1%; $n = 48$). About half of participants defined their sexual orientation as heterosexual (56.0%; $n = 243$), with 11.1% ($n = 48$) identifying as bisexual, 18.0% ($n = 78$) as gay/lesbian, 8.8% ($n = 38$) as queer, 3.9% ($n = 17$) as pansexual, and 2.3% ($n = 10$) as "other" including asexual or uncertain. Couples had been in their current relationship from 1 year to 37.83 years ($M = 5.90$, $SD = 5.05$). Most couples were living together without being married (71.9%; $n = 156$) and 28.1% were married ($n = 61$). A total of 78.8% ($n = 171$) of couples were child-free with others reporting between 1 and 5 children ($M = 0.45$, $SD = 1.01$).

Procedure

Data were collected as part of a larger longitudinal study of factors associated with sexual well-being in couples. For the background survey, eligible couples independently accessed a unique hyperlink to complete a consent form and a series of self-report questionnaires hosted by Qualtrics Research Suite. Three simple attention-testing questions were distributed within the background survey, and participants failing two out of three of these were excluded from the study and their data deleted. Each partner received a Can\$10 gift card for completing the background survey. When both partners had completed the background survey, they were contacted by a research assistant to explain the procedure for the daily diaries and set a start date. Each partner accessed a unique hyperlink received via email each evening at 18:00 with a reminder at 22:00, to complete a brief survey for 35 consecutive days (5 weeks). Participants were instructed to complete the survey every day before going to sleep and the link to the survey expired at 06:00 the next morning. To promote diary completion, a research assistant called the

couples twice per week asking to speak to each partner at least once a week. Compensation was prorated based on how many diaries participants completed, with a maximum of Can$50 each in gift cards for completing at least 85% of their diaries (30 entries out of 35). All procedures were approved by Université de Montréal and Dalhousie University's Institutional Review Boards.

Background survey

Sociodemographic characteristics. Items regarding participants' sociodemographic characteristics were used to gather information about sex, self-identified gender, age, cultural identity, number of years of schooling, personal annual income, sexual orientation, relationship status, relationship duration, and number of children. Participants self-reported their sex assigned at birth (i.e., biological sex) using a single item with three response choices: male, female, and intersex. One participant self-reported as intersex but defined himself as a man. Sex was effect coded (women $= -1$, men $= 1$) to facilitate the interpretation of conditional main effects. The number of children and relationship length were assessed with 1 item each: "How many children live with you at home full-time or part-time?" and "How long have you been in this relationship status?" When the two partners did not report the same relationship length, the mean of their responses was used.

Daily measures

Pornography use. At the onset of the pornography use's survey, pornography use was defined as in Kohut et al.'s (2017) study: "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." Then, 1 item was used to assess pornography use: "Did you use pornography in the last 24 hours?" with three response choices: "no, not at all," "yes, once," and "yes, more than once." To examine the associations with *having used pornography today* versus *not having used today*, and as *having used multiple times today* was reported only 2.1% of days, we recoded this item as a dichotomous variable with 0 = no pornography use and 1 = pornography use.

Relationship satisfaction. The Kansas Marital Satisfaction Scale (Schumm et al., 1983) was used to assess relationship satisfaction over the past 24 hr. This 3-item scale included: "How satisfied are you with your relationship with your partner today?" "How satisfied are you with your partner today?" and "How satisfied are you with your overall couple relationship today?" These items were rated on a 7-point Likert-type scale (1 = *extremely dissatisfied*, 7 = *extremely satisfied*), which were summed to provide a daily total score ranging from 3 to 21, with higher score indicating greater relationship satisfaction. This scale achieves good internal consistency and good concurrent and discriminant validity (Schumm et al., 1983, 1986). In the present study, Cronbach's α was .97.

Dyadic sexual desire. Two items from the dyadic sexual desire subscale of the Sexual Desire Inventory-2 (Spector et al., 1996) were used to assess participants' level of interest in sexual activity with their current partner over the past 24 hr. The following items were used: "How often did you feel sexual desire for your partner today?" and "Did you initiate or express interest in sexual activity with your partner today?" These items were rated on a 7-point Likert-type scale (1 = *not at all*, 7 = *a lot*), which were summed to provide a daily score ranging from 2 to 14, with higher scores indicating greater dyadic sexual desire. In the present study, Cronbach's α was .85.

Partnered sexual activity. Two gender-neutral items from the Monash Women's Health Program Female Sexuality Satisfaction Questionnaire (Davison et al., 2008) were combined to assess sexual activity with the current partner: "I have had sexual activity within the last 24 hours" and if sexual activity was reported: "With who did you have this/these sexual activity(ies)?" with three response choices: "myself, alone," "my partner," and "another sexual partner." As presented to participants, sexual activity included foreplay, masturbation, vaginal penetration, anal penetration, manual stimulation, and oral stimulation. Partners' reports of sexual activity were highly correlated (r = .85, $p < .001$), but on some days (n = 330 out of 6,088 days) there was a discrepancy. The 2 items were recoded as 0 = both partners reported no sexual activity with the current partner and 1 = at least one partner reported at least one sexual activity with the current partner.

Data analyses

Descriptive analyses and bivariate correlations were performed using SPSS 25.0. Then, multilevel analyses were performed using M*plus* 8.0 (Muthén & Muthén, 1998–2017). Following Laurenceau and Bolger's (2012) recommendations for daily dyadic data and procedures for longitudinal dyadic data with indistinguishable dyads (Kashy et al., 2008; Peugh et al., 2013; West, 2013), we used a two-level multilevel model in which both partners' scores were modeled as multivariate outcomes and residual terms were allowed to be correlated between partners. As this sample included both same-sex and mixed-sex couples, sex could not distinguish all dyads and no other variable could, thus dyads were conceptually considered as indistinguishable. Daily reports (Level 1) were considered as nested within couples (Level 2) with each partner being randomly assigned to "partner 1" and "partner 2" and adding equality constraints on all parameters between partners (i.e., variance, actor effects, partner effects, means, and intercepts; West, 2013). The actor–partner interdependence model (APIM; Kenny et al., 2006) guided the analyses as we tested both actor effects (e.g., the association between one's own pornography use and own relationship satisfaction) controlling for partner effects (e.g., association between partner pornography use and own relationship satisfaction) and partner effects controlling for actor effects. 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 slopes for the effects of pornography use were estimated when possible. In addition to the within-person effect of pornography use, we estimated the between-person effect by including the sum of days a person used

pornography over the diary period as Level-2 predictors, which allowed the effects of daily pornography use to be interpreted as pure within-person effects, rather than as the association with frequency of use or compulsive use. We also controlled for linear time in all models. The multilevel analyses were performed with the maximum likelihood method for parameter estimation (ML) and a logit link when examining pornography use or partnered sexual activity as the outcome. On days both partners completed the diary, score-level missing data were handled using full information maximum likelihood (FIML) (Muthén & Muthén, 1998–2017). All coefficients reported are unstandardized coefficients and represent the change in the outcome variable when using pornography relative to days without pornography use.

To examine differences in the associations between pornography use and relationship outcomes between men and women as well as between same-sex and mixed-sex couples, cross-level interactions with these Level-2 indicators were added in each model: the respondent's sex, the partner's sex, and the interaction between respondent sex and partner sex (Kroeger & Powers, 2019; West et al., 2008). The interaction term allowed estimation of this association for four different groups: men partnered with men, men partnered with women, women partnered with men, and women partnered with women (Kroeger & Powers, 2019). When one interaction term was significant, simple slope tests were used to report the association at the different level of the moderator.

For the lagged-day analyses, we adjusted for each participant's score on an outcome from the previous day. Thus, the outcome represents the residualized change that occurred in this outcome since the previous day. For example, we examined if yesterday's pornography use was associated with today's relationship satisfaction after controlling for yesterday's relationship satisfaction. We further examined if yesterday's relationship satisfaction was associated with today's pornography use after controlling for yesterday's pornography use. In these inverse lagged-day analyses, when the predictors were continuous variables (i.e., relationship satisfaction and dyadic sexual desire), the Level-1 predictors were person-mean centered and the aggregated variable was added as a Level-2 predictor to avoid confounding within- and between-person associations.

Results

Descriptive analyses

The 434 participants (217 couples) individually completed a total of 13,134 diaries out of 15,190 (434 partners, 35 days) for a completion rate of 86.5% (30.26 diaries out of 35). Same-day diaries between partners were matched to form 7,046 couple entries in a dyadic data set with 13.6% (958 days) of these entries for which only one partner completed the survey that day. For the APIM, data were only included for days where both partners completed the survey (6,088 days per couple).

Table 1 presents the means, standard deviations, intraclass correlations, and bivariate correlations for each daily measure, aggregated within-person across all diaries. Correlations showed that a person's pornography use was positively associated with one's own dyadic sexual desire. Almost all couples reported at least one sexual activity during

Table 1. Descriptive statistics and within-person correlations among aggregated daily variables (N = 217 couples).

	M (SD)	Range	IIC	1	2	3	4
1. Pornography use	3.45 (5.22)	0–31	0.24	.24***	−.05	.12**	.09
2. Relationship satisfaction	17.77 (2.32)	7.42–21	0.50	−.06	.66***	.24***	.21***
3. Dyadic sexual desire	5.23 (1.89)	2–11.50	0.31	−.07	.17***	.33***	.48***
4. Partnered sexual activity	8.06 (5.19)	0–26	0.11	—	—	—	—

Note. IIC = intraclass correlation. 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.

the 35-day period (97.2%, $n = 211/217$). They engaged in sex on average 8.06 days out of the 35 days, ranging from 0 to 26 days.

Pornography use. In 80.6% ($n = 175/217$) of couples, at least one partner reported pornography use during the 35-day period. A total of 61.1% ($n = 265/434$) of participants reported use at least one day during the 35-day period with significantly more men (80.3%; $n = 143/178$) than women (47.7%; $n = 122/256$), $\chi^2(1) = 47.16$, $p < .001$, Cramer's $V = .33$. Percentages of participants reporting use at least one day during the 35-day period were not significantly different between mixed-sex (57.9%; $n = 162/280$) and same-sex couples (66.9%; $n = 103/154$), $\chi^2(1) = 3.40$, $p = .065$, Cramer's $V = .09$. However, percentages between the four groups created by the interaction between sex and type of couple were significantly different between all groups with 97.4% ($n = 37/38$) of men partnered with men, 75.7% ($n = 106/140$) of men partnered with women, 56.9% ($n = 66/116$) of women partnered with women, and 40.0% of women partnered with men reporting pornography use at least one day during the 35-day period, $\chi^2(3) = 60.67$, $p < .001$, Cramer's $V = .37$.

Participants reported using pornography an average of 3.45 days out of the 35 days, ranging from 0 to 31 days ($SD = 5.22$), which was significantly higher in men ($M = 5.90$, $SD = 6.28$, ranging from 0 to 29) compared to women ($M = 1.75$, $SD = 3.44$, ranging from 0 to 31), $t(432) = 8.01$, $p < .001$, $\eta^2 = .15$, but was not significantly different between mixed-sex ($M = 3.15$, $SD = 4.94$, ranging from 0 to 31) and same-sex couples ($M = 4.00$, $SD = 5.69$, ranging from 0 to 29), $t(432) = -1.54$, $p = .124$, $\eta^2 = .01$. Comparing the four groups created by the interaction between sex and type of couple, all means between groups were significantly different except between women partnered with men and women partnered with women ($p = .215$): men partnered with men ($M = 9.63$, $SD = 7.03$, ranging from 0 to 29), men partnered with women ($M = 4.89$, $SD = 5.68$, ranging from 0 to 27), women partnered with women ($M = 2.15$, $SD = 3.63$, ranging from 0 to 21), and women partnered with men ($M = 1.42$, $SD = 3.25$, ranging from 0 to 31), $F(434) = 38.75$, $p < .001$, $\eta^2 = .21$.

Preliminary correlations were conducted between aggregated outcomes and sociodemographic variables (i.e., age, cultural identity, years of schooling, annual income, relationship length, marital status, number of children) to examine the need to control for

some of these covariates. Relationship satisfaction was significantly associated with the number of children ($r = -.18$, $p < .001$) and partnered sexual activity was associated with relationship length ($r = .14$, $p = .047$) and participants' age ($r = .11$, $p = .024$). These covariates were added to their respective model, but given the high correlation between relationship length and participants' age ($r = .50$, $p < .001$), only relationship length was added to the model predicting partnered sexual activity.

Daily associations between pornography use and relationship satisfaction

Associations between actor and partner pornography use and daily relationship satisfaction were first examined including the cross-level interactions with actor sex, partner sex, and the interaction between actor and partner sex. This model also controlled for linear time, the number of children, and the sum of the number of days the participant and the partner used pornography during the 35-day period. The cross-level interactions with the Actor Sex × Partner Sex were nonsignificant for the actor association, $b = 0.04$, $SE = .08$; $p = .642$, and for the partner association, $b = 0.05$, $SE = .08$; $p = .551$, and upon removal of this triple interaction, cross-level interactions with actor sex and partner sex separately were nonsignificant and varied between $b = -0.15$ and 0.07, $SE = .08$; $p = .071$ and $.665$. Thus, the associations between actor and partner pornography use and relationship satisfaction were not different when the user was a man or a woman, when the user's partner was a man or a woman, or when the user was a man or a woman in a romantic relationship with a person of the same or mixed-sex. The final model without these cross-level interactions is presented in Table 2. Results showed that on days when a participant used pornography, it was unrelated to their own and their partner's relationship satisfaction on that day, compared to days when the participant did not use pornography.

Daily associations between pornography use and dyadic sexual desire

Associations between actor and partner pornography use and daily dyadic sexual desire were first examined including the cross-level interaction with actor sex, partner sex, and the interaction between actor and partner sex. This model also controlled for linear time and the sum of the number of days the participant and the partner used pornography during the 35-day period. The cross-level interactions with the Actor Sex × Partner Sex were nonsignificant for the actor association, $b = 0.20$, $SE = .12$; $p = .088$, and the partner association, $b = 0.05$, $SE = .11$; $p = .624$, and upon removal of this triple interaction, the cross-level interaction between actor pornography use and partner sex was nonsignificant, $b = 0.14$, $SE = .11$; $p = .216$, as well as the one between partner pornography use and actor sex, $b = 0.01$, $SE = .10$; $p = .941$, which were removed from the model. The association between actor pornography use and dyadic sexual desire was significantly different according to actor sex and the association between partner pornography use and actor dyadic sexual desire was significantly different according to partner sex. Thus, the associations between actor and partner pornography use and dyadic sexual desire were not different when the user was a man or a woman engaged with a person of the same or mixed-sex, but this association was different depending on

Table 2. Daily associations between actor and partner pornography use and daily relationship satisfaction ($N = 217$ couples, days = 6,088).

	Relationship satisfaction				
				95% CI	
Fixed effects (intercept, slopes)	b (SE)[a]	Z	p Value	Lower	Upper
Intercept	18.12 (.16)	115.49	<.001	17.81	18.43
Actor pornography use	−0.14 (.08)	−1.82	.069	−0.29	0.01
Partner pornography use	0.03 (.07)	0.36	.716	−0.12	0.17
Sum actor pornography use	−0.02 (.02)	−1.02	.308	−0.06	0.02
Sum partner pornography use	−0.03 (.02)	−1.36	.175	−0.07	0.01
Number of children	−0.44 (.11)	−4.11	<.001	−0.65	−0.23
				95% CI	
Random effects, (co-)variances	b (SE)[a]	Z	p Value	Lower	Upper
Level 1 (within-couple)					
Residual	4.96 (.07)	71.08	<.001	4.82	5.10
Between partner residual covariance	1.82 (.07)	26.37	<.001	1.69	1.96
Level 2 (between-couple)					
Intercept	4.72 (.34)	13.86	<.001	4.05	5.38
Actor slope	0.06 (.10)	0.53	.593	−0.15	0.26
Partner slope	0.02 (.13)	0.18	.859	−0.22	0.27

Note. SE = standard error; CI = confidence interval.
[a]Unstandardized regression coefficients. Linear time was included as a control variable.

the sex of the person who was using pornography. The final model including the significant cross-level interactions is presented in Table 3, as well as the simple slope tests for significant interactions. Results showed that on days when women used pornography, compared to days when women did not use pornography, they had higher dyadic sexual desire and their partner had higher dyadic sexual desire as well, regardless of whether the partner was a man or a woman. On days when men used pornography, compared to days when men did not use pornography, it was unrelated to their dyadic sexual desire, but their partner had lower dyadic sexual desire regardless of whether the partner was a man or a woman.

Daily associations between pornography use and partnered sexual activity

The associations between pornography use and daily partnered sexual activity were first examined including the cross-level interaction with actor sex, partner sex, and the interaction between actor and partner sex. This model also controlled for linear time, relationship length, and the sum of the number of days the person used pornography during the 35-day period. The cross-level interactions with the Actor Sex × Partner Sex were significant. Thus, associations between pornography use and partnered sexual activity were different depending on the sex of the participant who was using

Table 3. Daily associations between actor and partner pornography use and daily dyadic sexual desire (*N* = 217 couples, days = 6,088).

	Dyadic sexual desire				
				95% CI	
Fixed effects (intercept, slopes)	b (SE)[a]	Z	p Value	Lower	Upper
Intercept	5.66 (.14)	39.84	<.001	5.38	5.93
Actor pornography use	0.87 (.11)	7.67	<.001	0.65	1.09
Partner pornography use	0.19 (.10)	1.85	.065	−0.01	0.39
Actor Pornography Use × Actor Sex	−0.69 (.11)	−6.07	<.001	−0.91	−0.46
Partner Pornography Use × Partner Sex	−0.49 (.10)	−4.85	<.001	−0.69	−0.29
Sum actor pornography use	0.03 (.02)	1.68	.093	−0.01	0.07
Sum partner pornography use	−0.02 (.02)	−0.93	.350	−0.06	0.02
Actor sex	0.10 (.11)	0.91	.361	−0.11	0.30
Partner sex	−0.17 (.11)	−1.58	.114	−0.38	0.04
				95% CI	
Random effects, (co-)variances	b (SE)[a]	Z	p Value	Lower	Upper
Level 1 (within-couple)			—		
Residual	6.88 (.10)	68.65	<.001	6.69	7.08
Between partner residual covariance	3.07 (.10)	30.78	<.001	2.87	3.26
Level 2 (between-couple)					
Intercept	3.12 (.24)	13.24	<.001	2.66	3.58
Actor slope	0.84 (.23)	3.72	<.001	0.40	1.28
Partner slope	0.35 (.18)	1.94	.052	−0.00	0.69
				95% CI	
Simple slope tests	b (SE)[a]	Z	p Value	Lower	Upper
Women's actor pornography use	1.55 (.18)	8.60	<.001	1.20	1.90
Men's actor pornography use	0.18 (.14)	1.34	.181	−0.09	0.45
Women's partner pornography use	0.68 (.16)	4.15	<.001	0.36	1.00
Men's partner pornography use	−0.30 (.12)	−2.53	.012	−0.54	−0.07

Note. SE = standard error; CI = confidence interval.
[a]Unstandardized regression coefficients. Linear time was included as a control variable. The cross-level inter-actions are presented as the interaction between pornography use and the moderator for the sake of clarity, but was tested as the effect of the moderator on the Level-1 slope (i.e., actor pornography use on their own dyadic sexual desire or partner pornography use on the actor's dyadic sexual desire).

pornography and whether this user was in a romantic relationship with a woman or a man. The final model including all cross-level interactions is presented in Table 4, as well as the simple slope tests for the significant triple interaction. Results showed that on days when women used pornography, compared to days when women did not use pornography, they had higher odds of having partnered sexual activity, both for those in a romantic relationship with a man and those in a relationship with a woman. On days when men used pornography, compared to days when men did not use pornography, they

Table 4. Daily associations between actor and partner pornography use and daily partnered sexual activity ($N = 217$ couples, days $= 6,088$).

	Partnered sexual activity				
				95% CI	
Fixed effects (intercept, slopes)	b (SE)[a]	Z	p Value	Lower	Upper
Intercept	1.01 (.15)	6.60	<.001	0.71	1.31
Pornography use	0.39 (.08)	4.97	<.001	0.24	0.54
Pornography Use × Actor Sex	−0.34 (.07)	−5.19	<.001	−0.46	−0.21
Pornography Use × Partner Sex	0.17 (.06)	2.59	.010	0.04	0.29
Pornography Use × Actor Sex × Partner Sex	0.20 (.06)	3.25	.001	0.08	0.33
Sum pornography use	0.00 (.01)	0.13	.900	−0.02	0.02
Sex	−0.05 (.08)	−0.60	.551	−0.20	0.11
Actor Sex × Partner Sex	−0.19 (.09)	−2.24	.025	−0.36	−0.02
Relationship length	0.01 (.01)	0.46	.644	−0.02	0.03
				95% CI	
Random effects, (co-)variances	b (SE)[a]	Z	p Value	Lower	Upper
Level 2 (between-couple)					
Intercept	0.73 (.10)	7.19	<.001	0.53	0.93
				95% CI	
Simple slope tests	b (SE)[a]	Z	p Value	Lower	Upper
Women's pornography use, mixed-sex	0.69 (.15)	4.56	<.001	0.39	0.98
Women's pornography use, same-sex	0.76 (.14)	5.62	<.001	0.50	1.03
Men's pornography use, mixed-sex	−0.32 (.11)	−2.96	.003	−0.53	−0.11
Men's pornography use, same-sex	0.42 (.14)	2.93	.003	0.14	0.70

Note. SE = standard error; CI = confidence interval.
[a]Unstandardized regression coefficients. Linear time was included as a control variable. The cross-level interactions are presented as the interaction between pornography use and the moderator for the sake of clarity, but was tested as the effect of the moderator on the Level-1 slope (i.e., pornography use on partnered sexual activity).

had higher odds of having partnered sexual activity for those in a romantic relationship with a man, but for those in a romantic relationship with a woman, they had lower odds of having partnered sexual activity.

Directionality of daily associations

We conducted lagged-day analyses to test whether the associations found concurrently on the same day would hold on the next day. First, a participant's previous day pornography use, $b = -0.11$, $SE = .08$; $p = .140$; 95%CI [−0.27, 0.04], as well as the partner's previous day pornography use, $b = -0.02$, $SE = .07$; $p = .778$; 95%CI [−0.17, 0.12], were not significantly associated with today's relationship satisfaction when controlling for their own previous day relationship satisfaction. Similarly, a person's

previous day pornography use, $b = -0.15$, $SE = .09$; $p = .093$; 95%CI $[-0.33, 0.03]$, as well as the partner's previous day pornography use, $b = 0.01$, $SE = .10$; $p = .910$; 95%CI $[-0.18, 0.20]$, were not significantly associated with today's dyadic sexual desire when controlling for their own previous day dyadic sexual desire. Finally, a person's previous day pornography use was not significantly associated with today's partnered sexual activity when controlling for previous day partnered sexual activity, $b = -0.08$, $SE = .08$; $p = .349$; 95%CI $[-0.23, 0.08]$. These results show that pornography use and relationship outcomes occurred concurrently, within the same time frame, and that their associations were unrelated to pornography use on the previous day.

To further disentangle the association between pornography use and relationship indicators and whether relationship satisfaction, partnered desire, and sexual activity might precede pornography use, we examined lagged-day associations between previous day relationship indicators and the residual changes in the likelihood of using pornography the following day. A person's previous day relationship satisfaction, $b = -0.01$, $SE = .02$; $p = .612$; 95%CI $[-0.04, 0.03]$, as well as the partner's previous day relationship satisfaction, $b = -0.03$, $SE = .02$; $p = .063$; 95%CI $[-0.07, 0.00]$, were not significantly associated with today's pornography use when controlling for their own previous day pornography use. A person's previous day dyadic sexual desire, $b = -0.02$, $SE = .02$; $p = .256$; 95%CI $[-0.05, 0.01]$, as well as the partner's previous day dyadic sexual desire, $b = -0.01$, $SE = .02$; $p = .748$; 95%CI $[-0.04, 0.03]$, were not significantly associated with today's pornography use when controlling for their own previous day pornography use. However, previous day partnered sexual activity was significantly associated with lower odds of using pornography today, when controlling for their own previous day pornography use, $b = -0.24$, $SE = .09$; $p = .005$; 95%CI $[-0.41, -0.07]$.

Discussion

To the best of our knowledge, this study is the first to examine pornography use via a dyadic daily diary method, which captures both partners' pornography use close in time to when it occurred, minimizing retrospective biases and providing high ecological validity. We used this daily diary design to examine associations between an individual's pornography use and their own and their partner's relationship satisfaction, partnered sexual desire, and partnered sexual activity in mixed-sex and same-sex couples. Findings showed that an individual's everyday pornography use is associated with same-day couple's sexual dynamics but not with relationship satisfaction. For women, regardless of their partner's sex, pornography use is associated with positive sexual outcomes, whereas for men, particularly those in mixed-sex relationships, it may be negatively related to their partner's sexual desire and partnered sexual activity.

Daily reports showed a relatively high occurrence (40%–97%) and frequency of pornography use (1.4 to 9.6 days out of 35 days), with significant differences between men and women depending on whether they were partnered with a man or a woman. This may more accurately reflect the experiences of a diversity of couples than past studies using retrospective reports in mixed-sex couples only. These estimates cannot be easily compared with those from studies using retrospective recalls, which assess pornography use with different time frames such as since the beginning of their current relationship

(92% of men and 83% of women; Kohut et al., 2017) or in the last year (64%–71% of men and 34%–67% of women; Carroll et al., 2017; Willoughby et al., 2016; Willoughby & Leonhardt, 2020). However, our results assessing pornography use in the last 35 days appear in the high range of these estimates, particularly for men, which may suggest retrospective reports could underestimate actual pornography use.

The nonsignificant within-day association with relationship satisfaction regardless of users' sex and couple type was contrary to our hypothesis and to past findings using retrospective reports. However, results are in line with those of experimental studies using one time exposure, which found no association between in-lab pornography viewing and relationship satisfaction or love for the partner (Balzarini et al., 2017; Staley & Prause, 2013). The negative association reported in retrospective studies for men's use may not be noticeable shortly after viewing pornography once, on the same or the next day, but perhaps a small cumulative effect is being picked up over time with repetitive or even compulsive use (Vaillancourt-Morel et al., 2017; Wright et al., 2019). The association with relationship satisfaction, a general subjective relational outcome, may also vary according to the dyadic context surrounding use, such as using alone or with the partner (Kohut et al., 2018; Willoughby & Leonhardt, 2020) or depending on the partner's acceptance of pornography (Maas et al., 2018; Willoughby et al., 2016). The inverse association was also non-significant, as lower relationship satisfaction yesterday was not associated with using pornography today. Thus, on a daily basis, controlling for between-subject effects—a proxy for frequent use which is more akin to past retrospective studies—pornography does not appear to be related to relationship satisfaction.

Mostly in line with our hypothesis, when women used pornography, they and their partner reported higher dyadic sexual desire. When men used pornography, it was unrelated to their own dyadic sexual desire, but their partner reported lower dyadic sexual desire. These associations all occurred concurrently, on the same day, as previous day pornography use or dyadic sexual desire were unrelated to today's variables. These within-day findings are in line with research using retrospective reports in heterosexual couples (Poulsen et al., 2013; Willoughby & Leonhardt, 2020). Based on the excitation transfer theory, excitement and sexual arousal following women's use may create an erotic climate that fosters both women and partners' sexual desire (Zillmann et al., 1972). According to social comparison theory, men's use may activate the partner's feelings of inadequacy or sexual objectification and thus diminish partner desire, but not their own desire (Festinger, 1954). These gendered results for user's sex, unaffected by the partner's sex, suggest that the context surrounding men and women's pornography use, including distinct motivations for pornography use, may explain differential results (Carroll et al., 2017; Grubbs et al., 2019). However, these are within-day associations, such that we cannot determine temporal ordering. It is plausible that on days when a man's partner has lower levels of sexual desire, he uses pornography instead. This hypothesis could also explain why laboratory studies examining associations with desire to be close to the partner or sexual attractiveness found mixed results, as pornography use's context is controlled (Balzarini et al., 2017; Staley & Prause, 2013).

Viewing pornography today was associated with a higher probability of partnered sexual activity for women in mixed-sex and same-sex relationships and for men coupled with men, but with lower odds for men coupled with women. Some studies suggest that

pornography users will come to prefer arousal from pornography instead of from one's partner (Sun et al., 2014). This was not the case for women and for men in same-sex relationships. Hence, for some couples, using pornography may create an erotic climate that paves the way to, or is included in, partnered sexual activity. For men in mixed-sex couples, pornography may shift their vision of their female partner and men may be more affected by the way men and women are portrayed in most mainstream pornography (Bridges et al., 2010). Given women are less approving of pornography (Carroll et al., 2017), men partnered with women may also feel ashamed of using and avoid using their arousal to go to the partner. Findings build upon and extend research suggesting that pornography use is a highly gendered behavior. For dyadic outcomes, their association with pornography use depends on both the user and the partner's sex.

Limitations and future studies

This study has limitations that should be considered when interpreting the results. We surveyed couples every day over 35 days and tested lagged-day models, but the significant associations occurred concurrently, precluding the identification of a temporal sequence within days. The sample included a diversity of sexual orientations, which is lacking in pornography research, yet the generalizability of our results is potentially limited by our convenience sample of relatively young couples with little ethnic diversity. These sexually active couples reported relatively high relationship satisfaction and frequent partnered sexual activity (average of one to two times a week). The associations with pornography use may be different in couples together for a longer period, who present with more relationship distress or with less frequent or even no partnered sexual activity. Although our daily diaries included a detailed definition of pornography—an improvement over previous work—how it was defined should be taken into consideration when interpreting our findings. We used a measurement strategy similar to the one recently suggested by Kohut et al. (2019) that includes a working definition of both "pornography" and "use" and a precise temporal window (last 24 hr). Our definition of pornography used a broad category of materials (i.e., pictures, videos, and written or audio material) and included the depiction of nudity as well as sexual behavior. As this definition was broad, the associations may shift if only specific media or content are assessed. As the present study focused on demonstrating the use of dyadic daily diaries to examine pornography use, we did not address some potentially important covariates or moderators. Different relational contexts surrounding pornography use (e.g., shared or solitary use), specific pornography content, and personal attitudes toward pornography use (e.g., religious or moral beliefs) may affect the associations between pornography use and relational and sexual dynamics.

This first daily diary study examining pornography use gives rise to interesting directions for future research. Future studies should directly compare estimates of pornography use with daily diaries and retrospective reports using the same time frame to examine for the validity of retrospective reports. Multi-method studies (e.g., daily diaries, retrospective reports with longitudinal follow-up, and in-lab experimental task) could help understand if the method used affects the associations between pornography use and relationship and sexual dynamics. These studies would also shed light on the differences between the short-term daily effects of pornography use and the effects that

develop over longer periods, as other effects may arise. Future studies should also use both daily and longitudinal dyadic designs to examine the directionality of the associations between pornography use and multiple indicators of sexual and relationship well-being, controlling for important covariates (e.g., religiosity, partners' moral beliefs, masturbation). The relational context surrounding pornography use and the motivations driving use should be examined to determine the conditions under which pornography use may be positively or negatively associated with relationship and sexual dynamics.

Clinical implications

As pornography is now part of most couples' lives, with 81% of those in our sample reporting its use in the last 35 days, clinicians should include pornography use as part of their assessment of all types of couples' sexuality, yet use caution in labeling this use as excessive, problematic, or the trigger of couples' difficulties. Pathologizing all use of pornography or focusing only on the negative correlates of such use without consideration of actual associations with the user and their partner's romantic relationship represents a slippery slope that could stigmatize a sexual activity that is not problematic, and may even have positive implications for some couples. Clinicians should assess how pornography use is related to the couple's sexual dynamics (i.e., sexual desire and partnered sexual activity), including the relational context of use and how pornography use may result from, or feed into the couple's sexual dynamic, keeping in mind that women's use may be more positive than men's use in mixed-sex relationships. This assessment may also establish the basis of an open communication about pornography use and couples' attitudes and feelings about this activity.

ORCID iD

Marie-Pier Vaillancourt-Morel 🔟 https://orcid.org/0000-0002-8634-3463
Nathan D. Leonhardt 🔟 https://orcid.org/0000-0002-9253-117X

Open research statement

As part of IARR's encouragement of open research practices, the authors have provided the following information: This research was not pre-registered. The data and materials used in the research are available. The data and materials can be obtained at: https://osf.io/7dmzc/?view_only=4a559213a24343ee812d14d32f9cd5bc.

References

Ayres, M. M., & Haddock, S. A. (2009). Therapists' approaches in working with heterosexual couples struggling with male partners' online sexual behavior. *Sexual Addiction and Compulsivity*, *16*, 55–78. https://doi.org/10.1080/10720160802711952

Balzarini, R. N., Dobson, K., Chin, K., & Campbell, L. (2017). Does exposure to erotica reduce attraction and love for romantic partners in men? Independent replications of Kenrick, Gutierres, and Goldberg (1989) study 2. *Journal of Experimental Social Psychology*, *70*, 191–197. https://doi.org/10.1016/j.jesp.2016.11.003

Bridges, A. J., & Morokoff, P. J. (2011). Sexual media use and relational satisfaction in heterosexual couples. *Personal Relationships*, *18*, 562–585. https://doi.org/10.1111/j.1475-6811.2010.01328.x

Bridges, A. J., Wosnitzer, R., Scharrer, E., Sun, C., & Liberman, R. (2010). Aggression and sexual behavior in best-selling pornography videos: A content analysis update. *Violence Against Women*, *16*, 1065–1085. https://doi.org/10.1177/1077801210382866

Carroll, J. S., Busby, D. M., Willoughby, B. J., & Brown, C. C. (2017). The porn gap: Differences in men's and women's pornography patterns in couple relationships. *Journal of Couple and Relationship Therapy*, *16*, 146–163. https://doi.org/10.1080/15332691.2016.1238796

Daspe, M.-È., Vaillancourt-Morel, M.-P., Lussier, Y., Sabourin, S., & Ferron, A. (2018). When pornography use feels out of control: The moderation effect of relationship and sexual satisfaction. *Journal of Sex and Marital Therapy*, *44*, 343–353. https://doi.org/10.1080/0092623X.2017.1405301

Davison, S. L., Bell, R. J., La China, M., Holden, S. L., & Davis, S. R. (2008). Assessing sexual function in well women: Validity and reliability of the Monash Women's Health Program Female Sexual Satisfaction Questionnaire. *The Journal of Sexual Medicine*, *5*, 2575–2586. https://doi.org/10.1111/j.1743-6109.2008.00967.x

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7*, 117–139. https://doi.org/10.1177/001872675400700202

Goldberg, P. D., Peterson, B. D., Rosen, K. H., & Sara, M. L. (2008). Cybersex: The impact of a contemporary problem on the practices of marriage and family therapists. *Journal of Marital and Family Therapy*, *34*, 469–480. https://doi.org/10.1111/j.1752-0606.2008.00089.x

Grubbs, J. B., Wright, P. J., Braden, A. L., Wilt, J. A., & Kraus, S. W. (2019). Internet pornography use and sexual motivation: A systematic review and integration. *Annals of the International Communication Association*, *43*, 117–155. https://doi.org/10.1080/23808985.2019.1584045

Kahn, A. S., Ratan, R., & Williams, D. (2014). Why we distort in self-report: Predictors of self-report errors in video game play. *Journal of Computer-Mediated Communication*, *19*, 1010–1023. https://doi.org/10.1111/jcc4.12056

Kashy, D. A., Donnellan, M. B., Burt, S. A., & McGue, M. (2008). Growth curve models for indistinguishable dyads using multilevel modeling and structural equation modeling: The case of adolescent twins' conflict with their mothers. *Developmental Psychology*, *44*, 316–329. https://doi.org/10.1037/0012-1649.44.2.316

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. Guilford Press.

Klaassen, M. J. E., & Peter, J. (2015). Gender (in)equality in internet pornography: A content analysis of popular pornographic internet videos. *The Journal of Sex Research*, *52*. https://doi.org/10.1080/00224499.2014.976781

Kohut, T., Balzarini, R. N., Fisher, W. A., & Campbell, L. (2018). Pornography's associations with open sexual communication and relationship closeness vary as a function of dyadic patterns of pornography use within heterosexual relationships. *Journal of Social and Personal Relationships*, 35, 655–676. https://doi.org/10.1177/0265407517743096

Kohut, T., Balzarini, R. N., Fisher, W. A., Grubbs, J. B., Campbell, L., & Prause, N. (2019). Surveying pornography use: A shaky science resting on poor measurement foundations. *The Journal of Sex Research*, 1–21. https://doi.org/10.1080/00224499.2019.1695244

Kohut, T., Fisher, W. A., & Campbell, L. (2017). Perceived effects of pornography on the couple relationship: Initial findings of open-ended, participant-informed, "bottom-up" research. *Archives of Sexual Behavior*, 46, 585–602. https://doi.org/10.1007/s10508-016-0783-6

Kroeger, R. A., & Powers, D. A. (2019). Examining same-sex couples using dyadic data methods. In R. Schoen (Ed.), *Analytical family demography. The Springer series on demographic methods and population analysis* (Vol. 47, pp. 157–186). Springer.

Laurenceau, J.-P., & Bolger, N. (2012). Analyzing diary and intensive longitudinal data from dyads. In M. Mehl & T. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 407–422). Guilford Press.

Leonhardt, N. D., Spencer, T. J., Butler, M. H., & Theobald, A. C. (2019). An organizational framework for sexual media's influence on short-term versus long-term sexual quality. *Archives of Sexual Behavior*, 48, 2233–2249. https://doi.org/10.1007/s10508-018-1209-4

Maas, M. K., Vasilenko, S. A., & Willoughby, B. J. (2018). A dyadic approach to pornography use and relationship satisfaction among heterosexual couples: The role of pornography acceptance and anxious attachment. *The Journal of Sex Research*, 55, 772–782. https://doi.org/10.1080/00224499.2018.1440281

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus user's guide* (8th ed.).

Muusses, L. D., Kerkhof, P., & Finkenauer, C. (2015). Internet pornography and relationship quality: A longitudinal study of within and between partner effects of adjustment, sexual satisfaction and sexually explicit Internet material among newly-weds. *Computers in Human Behavior*, 45, 77–84. https://doi.org/10.1016/j.chb.2014.11.077

Park, B. Y., Wilson, G., Berger, J., Christman, M., Reina, B., Bishop, F., Klam, W. P., & Doan, A. P. (2016). Is Internet pornography causing sexual dysfunctions? A review with clinical reports. *Behavioral Sciences*, 6, 17. https://doi.org/10.3390/bs6030017

Perry, S. L. (2020). Pornography and relationship quality: Establishing the dominant pattern by examining pornography use and 31 measures of relationship quality in 30 national surveys. *Archives of Sexual Behavior*, 49, 1199–1213. https://doi.org/10.1007/s10508-019-01616-7

Peugh, J. L., DiLillo, D., & Panuzio, J. (2013). Analyzing mixed-dyadic data using structural equation models. *Structural Equation Modeling: A Multidisciplinary Journal*, 20, 314–337. https://doi.org/10.1080/10705511.2013.769395

Poulsen, F. O., Busby, D. M., & Galovan, A. M. (2013). Pornography use: Who uses it and how it is associated with couple outcomes. *The Journal of Sex Research*, 50, 72–83. https://doi.org/10.1080/00224499.2011.648027

Schumm, W. R., Nichols, C. W., Schectman, K. L., & Grigsby, C. C. (1983). Characteristics of responses to the Kansas Marital Satisfaction Scale by a sample of 84 married mothers. *Psychological Reports*, 53, 567–572. https://doi.org/10.2466/pr0.1983.53.2.567

Schumm, W. R., Paff-Bergen, L. A., Hatch, R. C., Obiorah, F. C., Copeland, J. M., Meens, L. D., & Bugaighis, M. A. (1986). Concurrent and discriminant validity of the Kansas Marital Satisfaction Scale. *Journal of Marriage and Family*, *48*, 381–387. https://doi.org/10.2307/352405

Spector, I. P., Carey, M. P., & Steinberg, L. (1996). The sexual desire inventory: Development, factor structure, and evidence of reliability. *Journal of Sex and Marital Therapy*, *22*, 175–190. https://doi.org/10.1080/00926239608414655

Staley, C., & Prause, N. (2013). Erotica viewing effects on intimate relationships and self/partner evaluations. *Archives of Sexual Behavior*, *42*, 615–624. https://doi.org/10.1007/s10508-012-0034-4

Sun, C., Miezan, E., Lee, N.-Y., & Shim, J. W. (2014). Korean men's pornography use, their interest in extreme pornography, and dyadic sexual relationships. *International Journal of Sexual Health*, *27*, 16–35. https://doi.org/10.1080/19317611.2014.927048

Tornello, S. L., Ivanova, K., & Bos, H. M. W. (2017). Same-sex and mixed-sex couples in the Netherlands: The association between life satisfaction and relationship dynamics. *Journal of Family Issues*, *39*, 1443–1464. https://doi.org/10.1177/0192513x17710771

Vaillancourt-Morel, M.-P., Blais-Lecours, S., Labadie, C., Bergeron, S., Sabourin, S., & Godbout, N. (2017). Profiles of cyberpornography use and sexual well-being in adults. *Journal of Sexual Medicine*, *14*, 78–85. https://doi.org/10.1016/j.jsxm.2016.10.016

Vaillancourt-Morel, M.-P., Daspe, M.-È., Charbonneau-Lefebvre, V., Bosisio, M., & Bergeron, S. (2019). Pornography use in adult mixed-sex romantic relationships: Context and correlates. *Current Sexual Health Reports*, *11*, 35–43. https://doi.org/10.1007/s11930-019-00190-2

Veit, M., Štulhofer, A., & Hald, G. M. (2016). Sexually explicit media use and relationship satisfaction: A moderating role of emotional intimacy? *Sexual and Relationship Therapy*, *32*, 58–74. https://doi.org/10.1080/14681994.2016.1193134

West, T. V. (2013). Repeated measures with dyads. In J. A. Simpson & L. Campbell (Eds.), *The Oxford handbook of close relationships* (pp. 731–749). Oxford University Press.

West, T. V., Popp, D., & Kenny, D. A. (2008). A guide for the estimation of gender and sexual orientation effects in dyadic data: An actor-partner interdependence model approach. *Personality and Social Psychology Review*, *34*, 321–336. https://doi.org/10.1177/0146167207311199

Willoughby, B. J., Carroll, J. S., Busby, D. M., & Brown, C. C. (2016). Differences in pornography use among couples: Associations with satisfaction, stability, and relationship processes. *Archives of Sexual Behavior*, *45*, 145–158. https://doi.org/10.1007/s10508-015-0562-9

Willoughby, B. J., & Leonhardt, N. D. (2020). Behind closed doors: Individual and joint pornography use among romantic couples. *The Journal of Sex Research*, *57*, 77–91. https://doi.org/10.1080/00224499.2018.1541440

Wright, P. J., Steffen, N. J., & Sun, C. (2019). Is the relationship between pornography consumption frequency and lower sexual satisfaction curvilinear? Results from England and Germany. *The Journal of Sex Research*, *56*, 9–15. https://doi.org/10.1080/00224499.2017.1347912

Wright, P. J., Sun, C., Steffen, N. J., & Tokunaga, R. S. (2017). Associative pathways between pornography consumption and reduced sexual satisfaction. *Sexual and Relationship Therapy*, *34*(4), 422–439. https://doi.org/10.1080/14681994.2017.1323076

Zillmann, D., Katcher, A. H., & Milavsky, B. (1972). Excitation transfer from physical exercise to subsequent aggressive behavior. *Journal of Experimental Social Psychology*, *8*, 247–259. https://doi.org/10.1016/S0022-1031(72)80005-2