Pornography Use and Marriage Entry During Early Adulthood: Findings from a Panel Study of Young Americans

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Abstract

A number of recent studies have examined the connection between pornography use and relationship outcomes for Americans already in marriages. The current study takes this research in a different direction by examining (1) whether pornography use may be associated with entrance into marriage during early adulthood and (2) whether this association is moderated by both gender and religion, two key factors strongly related to both pornography use and earlier marriage. Longitudinal data were taken from waves 1, 3, and 4 of the National Study of Youth and Religion, a nationally-representative panel study of Americans from their teenage years into early adulthood (N = 1,691). It was theorized that frequent pornography use at earlier survey waves may foster more sexually progressive attitudes that may lead to devaluing marriage as an institution, and, for religious men in particular, may disincentivize marriage as a “socially legitimate” means of sexual fulfillment. Findings affirmed that, compared to more moderate levels of pornography use, higher levels of pornography use in emerging adulthood were associated with a lower likelihood of marriage by the final survey wave for men, but not women. This association was not moderated by religiosity for either gender. Moreover, among men, higher frequency pornography viewers were not significantly different from non-viewers in their likelihood of marriage entry. Data limitations and implications for future research are discussed.

Key words: pornography; marriage; family; gender; religiosity; panel data

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INTRODUCTION

Around the world, and particularly in developed nations with unrestricted Internet access, pornography use has become increasingly common in recent decades (Doring, 2009; Ogas & Gaddam, 2011). Much of this increase stems from the greater accessibility and anonymity provided by the Internet and smartphones, as well as the wider cultural acceptance of pornography use as a practice (Buzzell, 2005; Lykke & Cohen, 2015; Price, Patterson, Regnerus, & Walley, 2016; Regnerus, Gordon, & Price, 2016). In the United States, this increase has been most pronounced among men. Using data from the 1973-2016 General Social Surveys (GSS), Perry and Schleifer (2017) showed that the predicted percentage of men who reported viewing an “X-rated movie” in the previous year increased from roughly 26% in 1973 to 43% in 2016, while this percentage stayed right around 20% for American women on average. Notably, younger cohorts of American men and women have shown the greatest increase in their likelihood of viewing pornography. Also using aggregated GSS data, Price et al. (2016) showed that 20% more men and 10% more women under 36 years old viewed pornography in the 2010s compared to the 1970s. Today, by some recent estimates, the majority of American men under 40 and roughly a quarter of women that same age intentionally seek out pornography at least monthly, and 46% of such men at least *weekly* (Regnerus et al., 2016).

In light of the growing prevalence of pornography use in the United States, researchers have started to consider the potential implications of this use for mental and sexual health (for reviews, see Doring, 2009; Oddone-Paolucci, Genuis, & Violato, 2000; Short et al., 2012); adolescent development (for reviews, see Owens, Behun, Manning, & Reid, 2012; Peter & Valkenburg, 2016); as well as important social institutions like the family, and marriage especially. While there has been an abundance of studies looking at the association between

pornography use and marital outcomes such as marital quality (see reviews in Campbell & Kohut, 2017; Manning, 2006; Newstrom & Harris, 2016; Rasmussen, 2016; Wright, Takunaga, Kraus, & Klann, 2017) and stability (for example, see Daines & Shumway, 2011; Perry, 2017a; Perry & Schleifer, 2018), few studies have empirically examined whether pornography use may be associated with whether Americans' *enter* into marriage (Malcolm & Naufal, 2016), and none using longitudinal data that can better establish temporal precedence. Yet there are several theoretical reasons why an association between pornography use and marriage entry would be expected. First, experimental and longitudinal research (e.g., Gwinn, Lambert, Fincham, & Maner, 2013; Lambert, Negash, Stillman, Olmstead, & Fincham, 2012; Zillmann & Bryant, 1988; Wright, Tokunaga, & Bae, 2014) has shown that pornography use is associated with lower appraisals of monogamy, marriage, or fidelity, and thus it is reasonable to expect that frequent pornography use would be associated with a lower interest in marriage itself. Second, and particularly for more religious populations, marriage has historically been viewed as providing social legitimacy to sexual activity for young people (Burke, 2016; Diefendorf, 2015; Regnerus, 2007). Just as the greater cultural acceptability of casual, premarital sex may have created a disincentive to get married for these populations (see Carroll et al., 2007; Malcolm & Naufal, 2016; Regnerus, 2017), pornography use may similarly disincentivize marriage since it provides a sexual outlet that is private and freely available.

Drawing on panel data from a nationally-representative sample of Americans ages 18-28, our study is the first to longitudinally examine whether earlier pornography use is associated with entrance into marriage during early adulthood, here defined as being between 24 and 28 years old. Because both pornography use and earlier marriage are both powerfully influenced by

gender and religious commitment, we considered how these factors might moderate this porn-marriage relationship as well.

Who Gets Married Earlier in Adulthood and Why?

Research has consistently shown a number of key sociodemographic factors predict entrance into “early marriage” (which Uecker and Stokes [2008] define as marriage before age 23) or marriage as young adults generally speaking. Among these, people who marry in young adulthood are more likely to be female; more religious; conservative Protestant; less educated; not black; and live in the South (Axinn & Thornton, 1992; Goldscheider & Waite, 1986; Lehrer, 2004; Lloyd & South, 1996; Michael & Tuma, 1985; Schoen, Landsdale, & Daniels, 2005; Smock, Manning, & Porter, 2005; Teachman, 1983; Thornton, 1991; Uecker, 2014; Uecker & Stokes, 2008; Wolfinger, 2003). They are also more likely to have parents of a lower socioeconomic status and who also married earlier in life (Axinn & Thornton, 1992; Uecker & Stokes, 2008). These factors represent a combination of a number of structural and cultural influences shaping marriage decisions. And though marriage itself is becoming increasingly less common among poorer or working class Americans (Cherlin, 2014; Gibson-Davis, Edin, & McLanahan, 2005), historically, those who come from a lower socioeconomic status get married at an earlier age, and consequently forego further educational attainment, because they recognize fewer opportunities that such education might bring, and thus, have less reason to delay marriage (Axinn & Thornton, 1992; Cherlin, 2010).

Other cultural factors such as living in the South and being highly religious or conservative Protestant influence young Americans’ normative expectations regarding family formation as well as ideological pressures to marry early and have children (Uecker, 2014; Uecker & Stokes, 2008). While most Americans still esteem marriage as an institution (Cherlin,

2010, 2014; Gibson-Davis et al., 2005), marriage is a particularly important —what several authors call “sanctified”—institution within religious communities (Ellison et al. 2011; Mahoney, 2010). One of the key ideological factors contributing to marriage’s importance among religious communities is the belief that marriage is the only legitimate context for sexual intimacy (Burke, 2016; Regnerus, 2007). Consequently, one historically important motivation for getting married earlier, and particularly so among devoutly religious Americans, was so that they could have sex (Mohler, 2009; Regnerus, 2009).

Theorizing Pornography’s Association with Entrance Into Marriage

While some research suggests that viewing erotic material may hold potential benefits to committed relationships, particularly when couples view it together (see Campbell & Kohut, 2017), research focusing on marriage relationships has more consistently found pornography use to be associated with lower marital quality (see Rasmussen, 2015; and Wright et al., 2017 for reviews) and stability (Perry, 2017a; Perry & Schleifer, 2018). While the vast majority of these studies have been cross-sectional, and thus, there is the distinct possibility that pornography use is the result of lower marital quality, longitudinal studies have also shown that earlier pornography use predicts poorer marital outcomes over time (e.g., Muusses, Kerkhof, & Finkenauer, 2015; Perry 2017a, 2017b; Perry & Schleifer, 2018). Interpreting these trends, scholars suggest that frequent pornography use, particularly when done in isolation, may shape viewers’ expectations about body image or sexual relationships in unrealistic ways, causing viewers to grow dissatisfied with their own sexual relationships, partners, or spouses (see Rasmussen, 2015; Wright et al., 2017).

Directly related to the present research, several studies have suggested that the content of pornography, which itself often portrays scenes involving numerous anonymous sexual partners

with no committed relationship implied, may have a “liberalizing effect,” leading viewers to devalue traditional institutions like monogamy, marriage, and marital fidelity. In Zillmann and Bryant’s (1988) early experimental study, the authors found that among young men and women regular exposure to pornography prompted an increase in acceptance of non-exclusive sexual relationships, extramarital infidelity, and a belief in the naturalness of sexual promiscuity.

Importantly, greater pornography exposure also lowered participants’ opinions about the importance or viability of marriage. Similarly, in their study of over 800 emerging adults, Carroll et al. (2007) found that greater acceptance of pornography was associated with a greater value of singleness and a higher ideal age for marriage. Other more recent studies suggest that viewing pornography may lead to a lower valuation of monogamy and fidelity. Both experimental and longitudinal studies (Gwinn et al., 2013; Lambert et al., 2012) found pornography use predicted extradyadic romantic behavior among those in romantic couples. Focusing on marital faithfulness in particular, Wright et al. (2014) found with representative longitudinal data that earlier pornography viewing was associated with more positive attitudes toward extramarital sex over time. Similarly, other studies using cross-sectional data (Doran & Price, 2014; Stack, Wasserman, & Kern, 2004; Wright & Randall, 2014) have found that viewing X-rated movies or Internet pornography is positively associated with actually having an extramarital affair (though they could not establish temporal precedence).

Based on these findings, it is expected that young persons who view pornography more frequently would be less likely to view marriage as an important institution that they are inclined to participate in, such that they would be less likely to marry in early adulthood. More formally:

Hypothesis 1: *Higher levels of pornography viewing will be associated with a lower likelihood of entrance into marriage during early adulthood.*

Beyond this general expectation, however, studies have suggested that the influence of pornography viewing on Americans' outlook and intimate relationships is highly gendered, stemming from different use patterns among men and women. In an early experimental study, Kenrick, Gutierrez, and Goldberg (1989) exposed men and women to pornographic images, with married men (not women) rating their interest in their own spouses lower after viewing the images (see also Albright, 2008).¹ Similarly, the vast majority of studies on pornography use and relationships show that men's relationships, married and unmarried alike, are more strongly tied to their pornography use than women (Wright et al., 2017). Scholars generally attribute this trend to men viewing pornography more frequently than women, and more often in isolation for masturbatory purposes, whereas women are more likely to view pornography with a partner in the context of lovemaking (Bridges & Morokoff, 2011; Poulsen, Busby, & Galovan, 2013). Based on findings suggesting men's marriage relationships and relationship attitudes are more likely to be associated with their pornography use compared to women, we predict that:

Hypothesis 2: *Higher levels of pornography viewing will have a stronger negative association with the likelihood of entrance into marriage during early adulthood for men compared to women.*

Another possible link between pornography use and entrance into marriage suggests that the connection would be more explicitly gendered based on pornography's providing a low-cost substitute for marital sex for men. Using data on men between ages 18 and 35 from the 2000-2004 cross-sectional GSS, economists Malcolm and Naufal (2016) showed that Internet use, and Internet pornography use especially, predicted a lower-likelihood of marriage. Employing an instrumental variable approach to mitigate self-selection, the authors argued that pornography use was likely serving as a marriage-substitute for men, reasoning that "If one of the reasons to

¹ We would also acknowledge that a recent study failed to replicate Kenrick et al.'s (1989) finding (see Balzarini, Dobson, Chin, & Campbell, 2017).

get married (sexual gratification) has a low-cost alternative, then it is natural to wonder about the extent to which one can replace the other” (2017:23). Similarly, in his recent analysis of sex and marriage, Regnerus (2017) theorized that a large percentage of his male participants who happened to be off the dating market were not coincidentally viewing pornography due to their lack of sex partners, but the pornography use—as a “cheap” alternative to actual relationships—was somehow influencing them to disengage from dating altogether.

These arguments, however, are based on highly-contested economic exchange theories of sexuality as well as assumptions that essentialize a higher sex drive to men compared to women (see England’s [2017] critique of Regnerus’s arguments). A more plausible application of this argument, we argue, is that because religious conservatism and commitment is often associated with traditionalist sexual mores and values regarding premarital chastity and masculine agency in sexuality (Burke, 2016), pornography as a private alternative to premarital sex or cohabitation might serve to disincentivize marriage for *these* Americans. As Diefendorf (2015) explored in her ethnographic account of men’s “accountability” groups before and after marriage, devout Christian men often subscribe to a narrative of chastity before marriage and view marriage as the long-awaited outlet for their sexual energies. To the extent that such men are privately viewing pornography, this may attenuate some of their explicitly sexual motivations for marriage. Rather than essentialize to men and women, in other words, the issue may be more subcultural.

Additionally, research suggests that religious men who frequently view pornography tend to wrestle with considerable shame regarding their viewing practices, in some cases so extreme that it causes them to disengage from important social relationships (see Grubbs & Perry, 2018; Grubbs, Perry, Wilt, & Reid, 2018; Perry & Hayward, 2017). Consequently, young Americans who frequently view pornography *and* are highly religious might be even less likely to enter into

early marriage, compared to either those who are more religious and do not view pornography or view pornography without being religious. Based on the possible moderating roles of religion we have outlined, we expected that:

Hypothesis 3: *Higher levels of pornography viewing will have a stronger negative association with the likelihood of entrance into marriage during early adulthood for those who are more religiously committed.*

Further, because we already anticipate the association between pornography viewing and marriage entrance to be gendered, and because we expect the moderating influence of religiosity to be somewhat gendered as well based on theories above, our fourth hypothesis stated:

Hypothesis 4: *The moderating effect of religious commitment on the link between pornography viewing and entrance into marriage during early adulthood will be stronger for men than women.*

METHODS

Participants

The data for this study came from the National Study of Youth and Religion (NSYR), a nationally representative, longitudinal telephone survey of teenagers and, later, emerging and early adults. The first wave of the NSYR interviewed 3,290 teenagers and one of their parents from July 2002 to August 2003. The sample was obtained using random-digit-dialing, drawing on a sample of randomly generated telephone numbers representative of all non-cellular phone numbers in the United States. The survey attained an 81% cooperation rate among eligible households. Comparisons of the first wave of the NSYR data with 2002 U.S. Census data on households and with nationally representative surveys of adolescents—such as Monitoring the Future, the National Household Education Survey, and the National Longitudinal Study of Adolescent to Adult Health—confirm that the NSYR provides a nationally representative sample of U.S. teenagers ages 13 to 17 without identifiable sampling or non-response biases (for details,

see Smith & Denton, 2005). A second-wave survey was conducted in 2005, although those data are not used in this analysis. In the fall of 2007 a third, follow-up survey of the teens only (not parents) was conducted. At the time of this third wave the participants were all between the ages of 18 and 23 (i.e., emerging adulthood). 2,458 participants were re-surveyed for a two-wave response rate of just over 77%. The fourth wave of NSYR was fielded in 2013. At the time of this survey the participants were all between the ages of 23 and 28 (i.e., they have entered early adulthood).² The 2,071 complete responses represented a 66% retention rate from the initial survey. In the first three waves, all surveys were conducted via telephone. In the final wave, only 15% of surveys were conducted on the phone; the rest were completed online.

The majority of the independent variables for the analyses came from the third wave of the survey, including the participants' pornography viewing and religiosity. A number of key background measures, such as family socioeconomic status, parent religiosity, family structure, and race-ethnicity, came from the first wave survey because they are not available in later waves. The marital status outcome measure came from the fourth and most recent wave of the survey. Given our interest in the longitudinal association between pornography use and marriage entry, our analytic sample consisted of men and women who participated in both the third and fourth wave of data collection ($N = 1,838$). To ensure the temporal direction of the tested relationship, the small number of cases who reported being married at the Wave 3 survey ($n = 117$, 6.3% of available sample) were eliminated. Less than 2% of the remaining participants had one or more missing values on the included measures, reducing the final analytic sample to 1,691.

Measures

² There are 5 cases with reported ages older than 28. These cases may have been miscoded. Sensitivity analyses showed that these cases do not influence the results and are therefore maintained with their reported ages.

Marital Status. The outcome for the analyses was having entered into a marital relationship by the Wave 4 survey. We create this dichotomous outcome based on participants' reports to the question, "What is your current marital status?" All participants who claim married, married but separated, divorced, or widowed were included in the "married" outcome (= 1), while all others were included in the reference group (= 0). By the final survey, 36% of participants reported having entered into marriage.

Pornography Viewing. Participants were asked, "About how many, if any, X-Rated, pornographic movies, videos, or cable programs have you watched in the last year?" to which they provided a verbatim response with a maximum of 300. Only 13 cases did not report a specific number of pornography programs watched. While this NSYR measure has been used in numerous other studies (e.g., Perry & Hayward, 2017; Rasmussen & Bierman, 2016, 2017; Regnerus et al., 2016), it is often recoded because it is highly skewed with a mean of 5.8 programs and a standard deviation of 23.8 (see recoding in Rasmussen & Bierman, 2016, forthcoming for comparison). To address analytic issues that stem from using skewed measures, a 3-category, ordinal measure of pornography viewing was created. The first category consisted of the 52% of participants that report not watching any pornographic programs. To distinguish between Moderate viewing and High viewing, the remaining 48% of participants were split into two approximately equal groups. The Moderate viewing group were participants who reported watching between 1 and 3 programs in the last year (24%), and the High viewing group were those who reported watching 4 or more programs (24%).

Religious Characteristics. Three indicators from the Wave 3 survey were used to create an index measuring emerging adult religiosity. The first of these measures is frequency of attendance at religious services (not counting weddings, baptisms and funerals), which ranged

from never (= 0) to once or more per week (= 6). This variable's mean of 1.76 (SD = 2.14) indicated that, on average, participants reported attending services more than a few times a year. Next, importance of faith was determined by a question asking participants, "How important or unimportant is religious faith in shaping how you live your daily life." The response options ranged from not important at all (= 1) to extremely important (= 5), and on average participants believe faith is somewhat important (mean = 3.09; SD = 1.41). The final measure of religiosity was the participant's frequency of personal prayer. This measure ranged from never to many times a day, with participants reporting they pray several times a month on average (mean = 2.07; SD = 1.35).³ The method used in Smith and Snell (2009) was employed to create a four category ordinal measure of religiosity based on the combination of these three individual measures. The average participant falls between Minimally and Moderately religious.

A measure of denomination affiliation following Steensland and colleagues' (2000) classification scheme was included to determine the primary religious tradition of the participant (see also Woodberry et al., 2012). Participants' reported place of attendance was used to make this categorization, except for non-attending participants and participants with ambiguous places of attendance, in which case self-identified denominational affiliation was used, which included a "not religious" response option. Conservative Protestant was the modal category (26%) and served as the reference category.

³ We considered including these measures of religiosity from the Wave 1 survey, recognizing that religiosity in the teenage years directly impacts religiosity in later adolescence and may influence several of the key predictors measured at the Wave 3 survey. To assess this potential spuriousness, we estimated all of our models including attendance at religious services, religious salience, and personal prayer measures from both Wave 1 and Wave 3. The results from these sensitivity analyses are similar to those that only control for the religiosity measures at Wave 3. We have chosen to only include the Wave 3 measures primarily given the robustness of the results and because of multicollinearity concerns. Part of the reason these Wave 1 religiosity measures do not alter the results is due to their high correlation with the Wave 3 measures. That is, there is actually a great deal of stability in young adults' religiosity: All of the Wave 3 measures correlate with their Wave 1 counterparts at or above .5.

Finally, two measures of the religiosity of participants' networks were used. Having a more religious family during adolescence could influence young adults' pornography viewing (Nelson, Padilla-Walker, & Carroll, 2012; Rasmussen & Bierman, 2016) as well as the likelihood of marriage (Uecker, 2014). Measures of parents' attendance at religious services, importance of faith, family prayer, and family religious conversations (all coming from the first survey) were incorporated to make a single family religiosity measure that was the average of these four items. Higher values indicated a more religious family environment ($\alpha = .73$). Finally, it was assumed that participants' friend network may influence the level of pornography viewing as well providing a potential mate pool. Therefore, a measure of the number of friends (out of a maximum of 5) the participant claimed was religious at the third survey was included.

Demographic Characteristics. Several background characteristic measures were included to control for their potential covariance with pornography viewing and marriage in early adulthood. A measure for household income based on parent participant reports from the first survey was included as a continuous indicator in \$5,000 increments. Parent education also was reported by the parent participant at the Wave 1 survey and ranged from less than a high school degree (= 0) to a professional degree (= 4). The average parent education attainment was some college (mean = 2.32; SD = 1.25). An indicator of living in a two-biological-parent home at the initial survey (60%) was included, as was an index of reported family closeness, which was created from 16 items, from both the parent and child survey, tapping the overall level of closeness in the family (e.g., how often each parent says "I love you," hugs the child, and how close child feels to parent). The Cronbach's α for the scale is .86, with a mean of 2.25 ($SD = .43$). An indicator of whether the participant was enrolled in post-secondary school (60%) and one for whether the participant was employed (66%) at the third survey were included to account for the

potential for education and work trajectories to impact family formation. An indicator for being male (47%) and a continuous measure of self-reported age at the third survey (mean = 19.99; SD = 1.40) were both used, along with a continuous measure of the reported number of dating or romantic partners (mean = 5.5; SD = 6.5). Participants' self-reported race at Wave 1 was included as a series of dummy variables indicating Black (13%), Hispanic (9%), and other race (6%), with White (72%) serving as the reference category. The participants' region of the country at the third wave was included as a series of three dummy measures with South (36%) set as the reference. Descriptive statistics for all variables are included in Table 1.

[TABLE 1 ABOUT HERE]

Plan of Analysis

The goal of the study was to assess the relationship between young adult pornography viewing and family formation. Specifically, the analyses examined whether more frequent pornography viewing at Wave 3 was associated with a reduction in the likelihood of marriage by Wave 4. As noted above, this was treated as an initiation model, whereby all participants ($n = 117$) who were already married at Wave 3 were excluded. The remaining participants ($n = 1,691$) were then used to examine if pornography viewing in the third survey (i.e., emerging adulthood) was associated with the likelihood of being married by the fourth survey (i.e., early adulthood). Modeling the relationship in this way clarifies the directionality of the relationship.

Given the dichotomous outcome measure, all models were estimated with logistic regression and included a weight to adjust for differential selection. Model 1 included only the demographic controls. Next, Model 2 introduced the measure of pornography viewing. The pornography viewing measure was entered as two dummy variables indicating being in the No Pornography Viewing group and in the High Pornography Viewing category, which set the

Moderate Viewing group as the reference category. Treating this measure in this way allowed us to assess both the general linear relationship (i.e., comparing high viewing to moderate viewing) between pornography viewing and any potential curvilinear relationship (e.g., whether both no viewing and high viewing are different than moderate viewing). Given the strong potential for young adults' religiosity and religious background to influence both their pornography viewing and entry to marriage, Model 3 introduced all of the religion measures. Finally, based on the strongly gendered nature of pornography viewing, Model 4 included all of the measures and an interaction between the pornography viewing dummy variables and gender.

It was also hypothesized that young adults' religiosity would moderate the association between pornography use and marriage entry and that this moderation could vary for men versus women. While it would be possible to create a three-way interaction between gender, pornography viewing, and religiosity, the interpretability of such terms can be difficult and unclear. Given the evidence from the gender interaction tests (discussed below), the sample was split by gender to estimate the interaction between pornography viewing and religiosity.

RESULTS

As shown in Table 1, just over 36% of participants reported being married by early adulthood. As noted above, the pornography viewing measure shows 52% of participants reported never watching pornography, with 24% being classified as Moderate and High Viewing. As anticipated, both of these key measures were gendered. Only 30% of men were married by early adulthood, compared to 43% of women. Even more dramatic, only 10% of women reported high pornography viewing with 40% of men reporting this high level of pornography viewing. Interestingly the difference by gender in Moderate Viewing was not nearly as dramatic with 22% of women and 27% of men viewing between 1 and 3 programs in a year. A much higher percentage of women were pornography abstainers (68%) than men (33%). The difference in

pornography use by gender appeared to be at the extremes, with women being more likely to not watch at all, and men being more likely to watch a high level.

Table 2 displays the results from the logistic regression models predicting being married at the final survey. Model 1 shows several expected relationships between the demographic control measures and the outcome. For example, having more highly educated parents significantly reduced the likelihood of marriage by early adulthood, whereas participants from the South were the most likely to be married by this stage, as shown by the negative coefficients for all of the included region indicators. Conversely participants who were older at the third survey were significantly more likely to be married by early adulthood. In line with our general gender expectations, men were significantly less likely to be married by early adulthood. When expressed in terms of odds ratios (e^b), before controlling for any of the focal predictors, men were 50% $((1-(\exp^{-.706}) \times 100))$ less likely to be married than women. The consistency of these relationships with previous research give us confidence in the validity of our outcome measure.

Model 2 introduced pornography viewing. The two coefficients can be interpreted as the difference in likelihood of being married in early adulthood between No Pornography Viewing and High Pornography Viewing compared to Moderate Viewing. The results show that there was not a significant difference between emerging adults who do not watch any pornography and those who watch 3 or fewer programs per year (Moderate) in terms of their likelihood of being married by early adulthood. There was a marginally significant ($p < .1$) difference, however, in this likelihood between emerging adults who watch 4 or more programs per year (High) and the Moderate viewers. Emerging adults who watched a high level of pornography were 31% less likely to marry by early adulthood than Moderate viewers, even after controlling for all of the control measures, providing initial (though weak) support for Hypothesis 1. Supplementary

analyses (results not shown) showed there was not a significant difference in the likelihood of marriage between High viewers and Non Viewers, with both being less likely (High viewers marginally so) than Moderate viewers to be married by early adulthood. This pattern of results reveals a nonlinear relationship, with Moderate pornography viewers being the most likely to be married by early adulthood, followed by Non-Viewers, who were not significantly different from Moderate or High viewers, and High viewers being the least likely to be married by this stage.

The full set of religion measures are included in Model 3. Focusing on the change from Model 2 to Model 3 in the pornography viewing coefficients demonstrates the extent to which religion is a confounding factor in the original relationship between pornography and marriage. First, the marginally significant negative relationship between high viewing and moderate viewing became nonsignificant once religious measures are included. The magnitude of the relationship also was diminished, suggesting that a portion of the original direct relationship stems from highly religious emerging adults being less likely to view pornography at a high level and being more likely to be married by early adulthood.

Interestingly, once religion was controlled, there was a marginally significant ($p < .1$) difference between Non Viewers and Moderate Viewers. Specifically, emerging adults who did not view any pornography were less likely to be married by early adulthood than moderate viewers, net of religiosity. Potentially this relationship stems from non-viewers being particularly disengaged from sexually intimate relationships, which in turn may inhibit marriage by this life stage. Supplemental analyses did not show any significant difference between Non Viewers and High pornography viewers' likelihood of marriage even after controlling for religion. We discuss this non-linear relationship in the conclusions.

While Model 3 would seem to contradict our first hypothesis that pornography use would be associated with a lower likelihood of entrance into marriage, our final model in Table 2 suggests that this was due to stark gender differences. Model 4 includes the interaction between pornography viewing and gender. The significant coefficient for the interaction between high pornography viewing and being male indicates that the association between high viewing and marriage entry is significantly different for men and women. Specifically, the term shows that the likelihood of marriage for high viewers compared to moderate viewers is significantly lower for men than women. This result supports our second hypothesis.

[TABLE 2 ABOUT HERE]

This relationship is plotted in Figure 1 using average marginal predicted probabilities.⁴ The graph illustrates the significant and large difference in the likelihood of marriage between male Moderate viewers and High viewers. It also demonstrates the small and nonsignificant difference between these two groups' likelihood of marriage among women. The main effect for high viewing in Model 4 of Table 2 supports this conclusion (Aiken & West, 1991). The nonsignificant main effect for gender in this final model shows that there was not a significant difference in men's and women's likelihood of marriage if they were moderate pornography viewers. While in the full sample young adults' religiosity eliminated the relationship between high pornography viewing and entry to marriage, this final model shows that there was an association between pornography viewing and delaying marriage but only for high viewing men.

[FIGURE 1 ABOUT HERE]

Given the clear difference between men and women that these full sample models show, we proceeded to test our final hypotheses concerning the moderating influence of religion on

⁴ This method uses all included cases' actual values, varying the focal measure, on the predictors to create a predicted probability for each case and then takes the average of those probabilities.

pornography viewing using a gender split sample. Table 3 displays the results from the logistic regression model that included all of the predictors and the interaction term between emerging adult religiosity and pornography viewing for men and women separately. While high pornography viewing is significantly and negatively associated with marriage entry for men (consistent with what we see in Figure 1), none of the interaction terms are significant, contrary to our expectations. Religiosity did not alter the association between pornography viewing and entry to marriage for either men or women.

[TABLE 3 ABOUT HERE]

DISCUSSION AND CONCLUSIONS

As viewing pornography has become more prevalent among younger Americans, scholars have increasingly sought to understand the implications of pornography viewing for various individual and social outcomes, with marital experiences being one of them. While a burgeoning literature has considered how pornography use might be related to certain outcomes for those already married, this study is the first to longitudinally examine whether pornography use is associated with young Americans' decision to enter into marriage in the first place. The analyses also sought to examine whether any association between pornography use and entrance into earlier marriage would be moderated by the key factors of gender and religion.

While a central hypothesis that pornography use would predict lower likelihood of early adults' entrance into marriage was unsupported in the main effect, gender interactions (Table 3) as well as splitting the sample by gender (Table 4) suggested this nonsignificant main effect was due to differences between men and women. Men who viewed pornography at high frequencies at Wave 3 were indeed less likely to be married by Wave 4 than moderate viewers, controlling for a variety of other factors. Women's pornography use, however, was statistically unrelated to

their likelihood of marriage by Wave 4. Also, contrary to our expectations, religious commitment did not moderate the link between frequent pornography consumption and marriage entry for either men or women. For young adult men it seems, viewing pornography is associated with a lower likelihood of marriage during early adulthood regardless of how religious they are.

Before elaborating on the implications of this study, several data limitations are worth addressing in order to chart a path for future research. First, while the NSYR panel data did allow for the establishment of temporal precedence in the relationship between pornography use and entrance into marriage for young adults, the analyses could only capture a relatively small window of the lives of men and women, and thus our study is unable to discern when and if participants who were unmarried at Wave 4 ever got married or how continuing pornography use might have been associated with those decisions in later life stages. Related to this, it is acknowledged that the median age of marriage in the United States during Waves 3 and 4 of the NSYR was right around 28-29 years for men and 26-27 years for women (United States Census Bureau, 2017), so it is only possible to view pornography's association with marriage entry at an average age rather than over the life course. While this limits how much the findings can be extrapolated to predict marriage outcomes beyond the average age of first marriage for men and women, we are unaware of how the trends identified here would change drastically in light of the controls that were included. A second data limitation is that we are unable to isolate the precise mechanisms that might connect men's pornography use at Wave 3 to their marriage by Wave 4. While we discuss several theoretical possibilities below, qualitative data would be more ideal to flesh out the connections between pornography use and marriage decisions for these populations.

These limitations notwithstanding, this study extends research on the relationship between pornography use and family formation in two important ways. First and foremost, the

findings suggest that frequent consumption of pornography, particularly for young adult men, and regardless of how religious they are, is associated with a lower likelihood that they will marry as young adults. Related to this, and consistent with previous research on pornography's influence on individual relationship decisions and behavior, high frequencies of pornography use did not correlate to young women's entrance into marriage as they did for men. As pointed out in the descriptive statistics, this non-effect might have been due to the relatively small number of women who viewed pornography at the highest frequencies relative to men. But theoretically, we also expected this to be the case because studies of women's pornography use suggest they are more likely than men to view pornography when they are already in a committed relationship, not in isolation or even as an alternative to a romantic relationship as men are more likely to do.

An interesting twist on the findings, however, was that the association between pornography use and marriage entry during early adulthood did not seem to be linear for men. While evidence was found for differences in marriage entry between the most frequent pornography viewers and moderate viewers, there were no significant differences between more frequent viewers and non-viewers. As suggested in the results section, young adult non-viewers may include those who are still naïve and disengaged in terms of romantic relationships. As shown in the descriptive results, it is rare for emerging adult men to not have any exposure to pornography. These emerging adults, for whatever reason, may have not begun the initial steps into exploring and experiencing intimate relationships, real or virtual. Given this overall lack of experience, that may be indicated by their complete abstinence from pornography viewing, they may not be in a position to move into a marital relationship by early adulthood.

A second implication of the findings is that religion, and particularly religious commitment, did not seem to moderate the link between men's pornography use and their

entrance into marriage. It was theorized that men who are more religious, and thus likely hold premarital chastity as a higher priority than other men, might show a stronger association between their marriage choices and their pornography use since religious men would be less likely to be experiencing partnered sexual relationships before marriage. This seemed not to be the case however as both irreligious and religious men alike who used pornography were similarly less likely to be married by the next survey wave. In terms of the mechanisms connecting pornography and marriage decisions, it could be that the content of pornography itself has a “liberalizing effect,” serving to lower men’s evaluation of marriage as an institution (Carroll et al., 2007; Zillmann & Bryant, 1988; Wright et al., 2014). Alternatively, it could also be that pornography provides a “low-cost” substitute for interpersonal romantic relationships for men that serves to disincentivize marriage, or even the sorts of intimate relationships that lead to marriage (Malcolm & Naufal, 2016). While the NSYR data do not allow us to determine the explicit mechanisms at work, qualitative interviews would be ideal to flesh these out.

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Table 1. Descriptive Statistics for Study Variables

	Full Sample (n = 1,691)		Men (n = 799)		Women (n = 802)		Range
	Mean	SD	Mean	SD	Mean	SD	
Ever Married (W4)	.36		.30		.43		0, 1
No Pornography Viewing	.52		.33		.68		0, 1
Moderate Pornography Viewing	.24		.27		.22		0, 1
High Pornography Viewing	.24		.40		.10		0, 1
Conservative Protestant	.26		.24		.31		0, 1
Mainline Christian	.12		.11		.12		0, 1
Black Protestant	.07		.06		.07		0, 1
Catholic	.19		.19		.18		0, 1
Jewish	.01		.01		.01		0, 1
Mormon	.03		.03		.03		0, 1
Indeterminate Christian	.03		.03		.03		0, 1
Other Religion	.03		.04		.02		0, 1
Not Religious	.26		.29		.23		0, 1
Religiosity	1.43	1.09	1.30	1.11	1.54	1.07	0–3
Number of Religious Friends	2.13	1.70	2.04	1.77	2.22	1.64	0–5
Family Religiosity	3.08	1.16	3.08	1.17	3.07	1.14	0–6
Family Income (W1)	59.81	31.08	62.47	30.26	57.49	31.61	5–105
Parents' education (W1)	2.32	1.25	2.49	1.21	2.17	1.26	0–4
Two-parent biological family (W1)	.60		.64		.57		0, 1
Family Closeness	2.25	.43	2.23	.42	2.27	.43	.2–3.1
South (W1)	.36		.34		.38		0, 1
Northeast (W1)	.18		.17		.18		0, 1
Midwest (W1)	.23		.24		.22		0, 1
West (W1)	.23		.25		.22		0, 1
White (W1)	.72		.75		.78		0, 1
Black (W1)	.13		.10		.16		0, 1
Hispanic (W1)	.09		.08		.10		0, 1
Other race (W1)	.06		.07		.06		0, 1
Male	.47						0, 1
Age	19.99	1.40	19.99		19.99	1.39	18–22
Enrolled in Post-Secondary School	.60		.58		.63		0, 1
Employed	.66		.63		.68		0, 1
Number of Dating Partners	5.53	6.52	6.37		4.79	5.50	0–100

Note: All variables are from Wave 3 unless otherwise noted.

Table 2. Coefficients from Logistic Regression Models Predicting Entering Marriage by Early Adulthood (Wave 4), by Pornography Viewing, including Religiosity and Controls ($n=1,691$)

	Model 1	Model 2	Model 3	Model 4
Family Income (W1)	.001	.001	.002	.003
Parents' education (W1)	-.239***	-.240***	-.251***	-.250***
Two-parent biological family (W1)	.105	.113	.026	.034
Family Closeness	.111	.108	.016	.018
<i>Region W1 (South)</i>				
Northeast (W1)	-1.029***	-1.037***	-.793***	-.783***
Midwest (W1)	-.354*	-.350*	-.207	-.216
West (W1)	-.312+	-.319+	-.247	-.256
<i>Race-Ethnicity (White)</i>				
Black (W1)	-1.121***	-1.116***	-1.677***	-1.704***
Hispanic (W1)	-.319	-.305	-.317	-.317
Other race (W1)	-.214	-.190	-.198	-.190
Male	-.706***	-.653***	-.722***	-.428
Age	.253***	.257***	.279***	.282***
Enrolled in Post-Secondary School	-.041	-.042	-.104	-.117
Employed	.273+	.264+	.245+	.242+
Number of Dating Partners	.012	.013	.014	.015
<i>Porn Viewing (Moderate Viewing)</i>				
No Viewing		-.157	-.320+	-.203
High Viewing		-.374+	-.316	.294
<i>Religious Tradition (Conservative Protestant)</i>				
Mainline Christian			-.135	-.097
Black Protestant			.431	.429
Catholic			-.468*	-.445*
Jewish			-1.867*	-1.814*
Mormon			-.203	-.200
Indeterminate Christian			-.331	-.304
Other Religion			.263	.267
Not Religious			-.363	-.325
Religiosity			.272*	.265*
Number of Religious Friends			-.044	-.039
Family Religiosity			.103	.112
Male $\times$ No Porn Viewing				-.202
Male $\times$ High Porn Viewing				-.942*
Constant	-5.56***	-5.44***	-6.09***	-6.05***

*** $p < .001$ ** $p < .01$ * $p < .05$ + $p < .10$ (two-tailed tests)

Reference categories are in parentheses next to italicized headings. All independent variables are from Wave 3 unless otherwise noted.

Table 3. Coefficients from Logistic Regression Models Predicting Entering Marriage by Early Adulthood (Wave 4), by Pornography Viewing and Interaction with Religiosity by Gender (Total $n=1,691$)

	Men	Women
Family Income (W1)	-.001	.007+
Parents' education (W1)	-.176+	-.348***
Two-parent biological family (W1)	-.065	.058
Family Closeness	-.078	.122
<i>Region W1 (South)</i>		
Northeast (W1)	-.657*	-.991***
Midwest (W1)	.033	-.447+
West (W1)	-.241	-.376
<i>Race-Ethnicity (White)</i>		
Black (W1)	-1.240*	-1.904***
Hispanic (W1)	-.371	-.319
Other race (W1)	.024	-.223
Age	.389***	.212*
Enrolled in Post-Secondary School	-.397+	.005
Employed	.072	.347+
Number of Dating Partners	-.002	.043
<i>Porn Viewing (Moderate Viewing)</i>		
No Viewing	-.440	-.287
High Viewing	-1.018*	.071
<i>Religious Tradition (Conservative Protestant)</i>		
Mainline Christian	-.231	-.090
Black Protestant	.355	.229
Catholic	-1.049***	.014
Jewish	-.780	-2.501*
Mormon	-.872	.347
Indeterminate Christian	-.712	.058
Other Religion	.464	-.504
Not Religious	-.692*	-.009
Religiosity	-.059	.451*
Number of Religious Friends	-.009	-.043
Family Religiosity	.242*	.028
Religiosity $\times$ No Porn Viewing	.059	-.031
Religiosity $\times$ High Porn Viewing	.315	.157
Constant	-7.467***	-4.759*
<i>n</i>	799	892

*** $p < .001$ ** $p < .01$ * $p < .05$ + $p < .10$ (two-tailed tests)

Reference categories are in parentheses next to italicized headings. All independent variables are from Wave 3 unless otherwise noted.

Figure 1. Predicted Margins of Entering Marriage by Early Adulthood (Wave 4), by Pornography Viewing and Gender Interaction ($n=1,691$)

Note: All results based on Model 4 from Tables 1. Predictions calculated using average margins. Error bars represent a 95% confidence interval