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## **Till Porn Do Us Part? A Longitudinal Examination of Pornography Use and Divorce**

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### **Abstract**

As pornography use becomes more commonplace in the United States, and increasingly so among younger cohorts, a growing literature is considering its potential connection to key social and cultural institutions. The current study examines the relationship between pornography use and one such institution—marriage. We draw on three-wave longitudinal data from 2006-2014 General Social Survey panel studies to determine whether married Americans' pornography use predicts their likelihood of divorce over time and under what social conditions. We employ a doubly robust strategy that combines entropy balancing with logistic regression models. We find that the probability of divorce roughly doubles for married Americans who begin pornography use between survey waves ( $N = 2,125$ ; Odds Ratio = 2.20), and that this relationship holds for both women and men. Conversely, discontinuing pornography use between survey waves is associated with a lower probability of divorce, but only for women. Additional analyses also show that the association between beginning pornography use and the probability of divorce is particularly strong among younger Americans, those who are less religious, and those who report greater initial marital happiness. We conclude by discussing data limitations, considering potential intervening mechanisms and the possibility of reverse-causation, and outlining implications for future research.

**Key words:** pornography, marriage, divorce, religion, gender, panel data

## Introduction

The consumption of sexually explicit media or “pornography” has increased considerably in the United States over the past few decades, due in large part to the increased privacy, affordability, and ease of access provided by the Internet and smartphone technology (Lykke & Cohen, 2015; Price et al., 2016). A recent study comparing pornography consumption across national surveys finds that between 55-70 percent of men and 30-40 percent of women below age 40 report viewing pornography in a given year (Regnerus et al., 2015). Research also suggests that younger cohorts of Americans, having grown up with lifelong access to the Internet, have shown the largest increase in porn use over the past few decades. A recent comparison of age and cohort effects using aggregated General Social Survey (GSS) data shows that, while the likelihood of viewing pornography increases across all cohorts, those from the 1980s onward (the first to experience the Internet as adolescents) show the most dramatic increase from previous cohorts in their porn use. Cohorts from the 1980s and 1990s also show the smallest decline in porn use across age, indicating that they are more likely than previous generations to continue viewing pornography as they get older (Price et al., 2016).

As pornography becomes ever more accessible and pervasive in the U.S., there is a growing need to carefully consider how its use may be associated with the health of various social and cultural institutions. The current study examines pornography’s relationship with one important institution—marriage. Over the past decade, a growing body of research has explored pornography’s connection with various measures of relationship *quality* for married or otherwise committed heterosexual couples (for reviews, see Campbell & Kohut, 2016; Manning, 2006; Perry, 2017a). Due to data limitations, however, no studies to date examine pornography’s potential association with marital stability or dissolution. The implications of such a connection

are considerable. Divorce affects a number of other groups beyond the married couple including their children, their community, and the economy (Amato, 2000; McManus & DiPrete, 2001), and because pornography use is growing among younger Americans, any observed association between porn use and marital stability could portend broader social consequences for Americans. Our study is the first to draw on data that are recent, nationally-representative, and longitudinal in order to establish whether beginning (or discontinuing) pornography use is associated with divorce for American men and women, and under what social conditions.

### **Theoretical and Empirical Background**

While the majority of studies connecting porn use to couples' relationship quality finds a negative association, the vast majority of these studies presuppose particular use-patterns for pornography—namely, that persons are primarily viewing pornography alone for the purposes of masturbation. It is this sort of pornography use that is most often negatively associated with relationship quality (Campbell & Kohut, 2016; Perry, 2017a; Willoughby et al., 2016). Under other circumstances, such as when couples view sexually explicit content together, pornography could potentially influence committed relationships in positive ways (Campbell & Kohut, 2016). This purpose for pornography use, however, appears to be far less often the case than one spouse or partner—and most often men—consuming pornography privately for solo-masturbation (see Bridges & Morokoff, 2011; Maddox et al., 2011; Manning, 2006).

Several pathways through which pornography use might be negatively associated with marital quality, and ultimately, stability, include pornography's connection to the consumer, the spouse, and other marriage-related factors like finances (Doran & Price, 2014; Yucel & Gassanov, 2010). Below we consider research on these pathways to develop hypotheses about pornography's association with marital stability, and under what social conditions. Because

relatively few studies looking at the links between porn use and couples' outcomes have focused solely on marriage relationships, we include research focusing on persons or couples who are dating, cohabitating, or married.

In accounting for the ways porn use can negatively influence committed relationships through the consumer, scholars have consistently drawn on the concept of sexual scripts (Gagnon & Simon, 1973). In this framework, pornographic images and messages (or “scripts”) are viewed as informing viewers' conscious or unconscious expectations of gender performance, body image, intimacy, and sexual relations in ways that can negatively affect actual sexual and romantic relationships (Sun et al., 2016; Wright, 2011, 2013a; Zillmann & Bryant, 1988). Wright (2011) has proposed a more nuanced application of the scripting concept (the sexual script acquisition, activation, and application model or “3AM”) to interpret why the sexual attitudes and behavior of men and younger persons are more consistently influenced by sexual media like pornography—primarily, because scripts from sexual media are more influential when they are more consonant with consumers' pre-existing scripts. Consistent with the scripting perspective, researchers often report a negative association between men's porn viewing frequency and their sexual satisfaction or quality among couples (Bridges & Morokoff, 2011; Morgan, 2011; Muusses et al., 2015; Perry, 2016; Poulsen et al., 2013; Yucel & Gassanov, 2010) and some research explicitly connects pornography use with men expressing greater sexual boredom or disappointment with one's partner or spouse (Albright, 2008; Grov et al., 2011). Also related to the scripting idea, some research, including experimental studies, suggests that the sexual scripts conveyed in pornography about casual sex and promiscuity lower porn users' evaluation of monogamy and marriage (Zillmann & Bryant, 1988) and actual commitment to their specific romantic relationships (Lambert et al., 2012). Additionally, other studies suggest that

pornography use may contribute to marital infidelity, which is a leading cause of divorce (Amato, 2010; Amato & Previti, 2003). Several studies using cross-sectional GSS data (Wright, 2013b) or longitudinal data (Wright, Tokunaga, & Bae, 2014) show that viewing pornography is associated with positive attitudes toward extramarital sex. Other studies using aggregated GSS data find that viewing an X-rated movie (Doran & Price, 2014) or Internet pornography (Doran & Price, 2014; Stack et al., 2004) is positively associated with having had an extramarital affair.

Pornography may also contribute to divorce through its influence on the spouse who is either not using it or using it to appease their partner. Many spouses—most often women—view their partner’s pornography use as a form of infidelity (Albright, 2008; Bergner & Bridges, 2002; Bridges et al., 2003; Grov et al., 2011; Schneider, 2000; Zitzman & Butler, 2009), which can induce resentment and weaken relational attachment. Studies also find that women in heterosexual unions report feeling more self-conscious about body image or sexual performance as a result of their male partner’s online sexual activities, thereby decreasing their own feelings of intimacy or sexual attraction to the partner, and generally undermining relationship quality and stability (Albright, 2008; Bergner & Bridges, 2002; Grov et al., 2011; Schneider, 2000; Stewart & Szymanski, 2012; Zitzman & Butler, 2009).

Lastly, pornography use could influence marital stability through its influence on other marriage-related factors like finances. While pornography use has become increasingly accessible and affordable, it remains one of the most profitable industries in the world, and millions of American porn users pay for content (Luscombe, 2016; Paul, 2005). To the extent that a significant amount of money is being spent on pornographic material, this could obviously be a source of marital conflict (Doran & Price, 2014). Related to this issue, studies show that the accessibility of sexually explicit media has become an issue for employers who now monitor

employees' online activity (Luscombe 2016). Researchers propose that if a marriage partner were to lose her or his job because of their porn viewing at work, this would result in significant strain on a marriage (Doran & Price, 2014; Manning, 2006).

It should also be kept in mind that the association between pornography use and marital quality is likely bi-directional, and perhaps even cyclical. Stack et al. (2004), found that a leading predictor of internet porn consumption is an unhappy marriage. And both Muusses et al. (2015) and Willoughby et al. (2016) recently found significant bi-directional associations between porn use and relationship quality. In qualitative interviews, Paul (2005) recounted how men who frequently viewed pornography often attributed their use of it to their own sexual frustrations or other relationship problems. It is possible that the initial thrust for men to use pornography is due to sexual frustration or dissatisfaction with the marriage, which itself would predict both lower relationship quality and stability (Amato & Previti, 2003; Yabiku & Gager, 2009).

While the studies cited above provide a starting point to theorize about the connection between pornography use and marital stability, they are limited in several important ways. First, with few exceptions (e.g., Doran & Price, 2014; Stack et al., 2004), they are almost always based on non-representative, convenience samples of individuals or couples, making generalizability an issue. In some cases, in fact, couples or respondents were actually selected *because* of their relationship troubles stemming from online sexual activity—a case of sampling on the dependent variable (e.g., Bergner & Bridges, 2002; Bridges et al., 2003; Schneider, 2000; Zitzman & Butler, 2009). Second, most of these studies analyze married and unmarried individuals or couples together (e.g., Albright, 2008; Bergner & Bridges, 2002; Bridges & Morokoff, 2011; Bridges et al., 2003; Grov et al., 2011; Poulsen et al., 2013; Schneider, 2000; Willoughby et al., 2016), and thus potentially conflate outcomes for persons in different relationship statuses.

Third, they are almost always based on cross-sectional data, thus precluding the possibility of establishing directional relationships. And fourth, because these studies are largely cross-sectional, their primary focus has been on *subjective* measures of relationship quality for those in *intact* couples, rather than more objective measures like union dissolution. As a result, the connection between pornography use and marital stability is far from established.

In fact, less than a handful of studies explore any empirical connection between pornography use and divorce at all. In Schneider's (2000) convenience sample of 91 women and 3 men, those who were recently divorced reported that their partner's online sexual activity was a major contributing factor. And in their study using the 1973-2010 cross-sectional GSS waves, Doran and Price (2014) find that persons who viewed an X-rated movie in the past year or Internet pornography in the past month were more likely to be divorced or separated. Because of the cross-sectional nature of the data, however, there is no way to discern whether these persons were divorced *because* of their porn use or vice versa.

The current study is the first to test whether pornography use is associated with marital stability over time, using longitudinal data from the nationally representative GSS panel studies. Building on the research suggesting that porn use is associated with a weakened attachment to marriage, with causality going in either direction or due to another intervening factor, we expect:

**Hypothesis 1:** Beginning pornography use will associated with a greater likelihood of divorce among married people.

Conversely, if beginning pornography use is associated with a greater probability of divorce, we reason that the reverse would hold true as well. That is, discontinuing pornography use may be associated with a decrease in the probability of divorce. Stated formally, we expect that:

**Hypothesis 2:** The cessation of pornography use be associated with a lower likelihood of divorce among married people.

In examining potential moderators, research leads us to make several predictions. First, as noted above, the link between pornography use and relationship outcomes for dating or married couples is often gendered. Several studies, for example, find that the negative association between pornography use and relationship quality is particularly strong for men and either weaker or non-existent for women (Bridges & Morokoff, 2011; Doran & Price, 2014; Perry, 2017a; Poulsen et al., 2013; Yucel & Gassanov, 2010). Scholars theorize that this is likely due to different use patterns among men and women, with men being more likely to view pornography alone to masturbate and women being more likely to view pornography within the context of a relationship as a part of love-making (Bridges & Morokoff, 2011; Poulsen et al., 2013). While our data will not allow us to tease out the reasons why people are using pornography, or whether they are using it as a couple, we expect that porn use will be more strongly associated with marital stability for men, who are more likely than women to view it often and privately.

**Hypothesis 3:** The association between pornography use and divorce will be stronger for men than for women.

We also expect the relationship between pornography and marital stability to differ across years of age. Younger Americans view pornography with greater frequency than older Americans (Price et al., 2016; Wright, 2013a) and older married persons are less prone to divorce due to greater maturity, establishment, and time already invested (Amato, 2010). This would suggest that the association between porn use and divorce would attenuate as married people age.

**Hypothesis 4:** The association between pornography use and divorce will be stronger for younger Americans than for older Americans.

Religion is closely connected both with pornography use (Perry, 2016, 2017b; Wright, 2013a) and marriage outcomes (Mahoney, 2011; Perry, 2016). Recent research suggests that the negative association between pornography use and marital quality may be stronger for those with



greater religious attachment. Examining data from the 2006 Portraits of American Life Study, Perry (2016) finds a stronger negative association between porn viewing frequency and marital satisfaction for those with highly-religious spouses. And Doran and Price (2014) find that that pornography use is more strongly connected to marital unhappiness and divorce for Americans who attended church at least weekly. These studies suppose that persons who are more deeply embedded with communities of coreligionists experience greater social and psychic costs connected to their porn viewing, and thus, their marital quality may be more negatively affected than it would be otherwise. Based on this reasoning, we predict that:

**Hypothesis 5:** The association between pornography use and divorce will be stronger for Americans who are more religious than for those who are less religious.

Lastly, because viewing pornography is negatively associated with marital happiness (Doran & Price, 2014; Perry, 2016, 2017a; Stack et al., 2004) which is also a predictor of divorce (Amato, 2010), we reason that the relationship between porn use and marital stability may be contingent on how happy people are in their marriage initially. Because previous research does not provide specific insights on this issue to generate hypotheses, we explore this as a research question.

**Research Question:** How does initial marital happiness potentially moderate any association between pornography use and divorce?

It is possible that, for those who are already unhappy in their marriages, the introduction of pornography may be either be an indicator of impending divorce or a contributing factor, while those in happier marriages would stay together. Or, conversely, for those who are less happy in their marriage initially, and thus already somewhat disconnected from their spouse, it may be that pornography use is unlikely to make matters worse.

## **Methods**

## *Data*

Our study uses the three 3-wave panels from the GSS panel data. The GSS is a nationally representative face-to-face survey of non-institutionalized, English-Spanish speaking American adults.<sup>1</sup> Each panel collected three waves of data in 2006, 2008, 2010, in 2008, 2010, 2012, and in 2010, 2012, 2014. Of the 4,510 respondents surveyed in 2006, the GSS randomly selected 2,000 to re-interview in 2008 and 2010. The 2006 panel response rate was 76.8 percent (N = 1,536) in 2008 and 83.1 percent (N=1,276) in 2010. Overall, 63.8 percent of the respondents empaneled in 2006 were re-interviewed in 2010. For the 2008 panel, the GSS empaneled 2,023 new respondents. Of these 2,023 new interviews for the 2008 panel, the GSS panel response rate was 78.2 percent (N=1,581) in 2010 and 81.9 percent (N=1,295) in 2012 with an overall 64.0 percent panel retention rate. The GSS interviewed 2,044 new respondents for their third panel. For the 2010 panel, the second wave response rate was 75.9 percent (N=1551) in 2012 and the third wave was 84.1 percent (N=1,304) in 2014. Overall, in the 2010 panel 63.8 percent of those first interviewed in 2010 were re-interviewed in 2014.

Our approach in this study builds on the literature on simulating “treatment effects” in non-interventional study designs (Morgan & Winship, 2007). These approaches take a binary “treatment” of interest—for example, viewing pornographic video—and attempt to mimic the randomization of respondents through matching or balancing strategies in order to isolate the “effects” of that variable. Because our main interest is isolating any potential “effect” of change in porn consumption on likelihood of divorce across waves, we transform these 3-wave panels

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<sup>1</sup> The GSS is collected by the Nation Opinion Research Center with funding from the National Science Foundation. The GSS is built upon an equal-probability multi-stage cluster sample of household for the entire United States. In 2006, the GSS began a three-wave rotating panel design to accompany their ongoing cross-sectional data collection strategy and this study makes use of this distinct panel data. Both the GSS cross-sectional data and the GSS panels are publicly available and can be downloaded from: <http://gss.norc.org/get-the-data>. For additional information concerning the GSS data and data collection procedures, see: <http://gss.norc.org/Get-Documentation>.

into a series of two-wave panels. This makes use of all three wave of the data, but does so while treating the data as a series of 2-wave panels by transforming the data as follows:

$$[Wave\ 1\ Wave\ 2\ Wave\ 3] \rightarrow \begin{bmatrix} Wave\ 1 & Wave\ 2 \\ Wave\ 2 & Wave\ 3 \end{bmatrix}$$

By performing this transformation, we are left with six 2-wave panels, two from each distinct panel collected by the GSS (2006-08 and 2008-10 from the 2006 panel; 2008-10 and 2010-12 from the 2008 panel; 2010-12 and 2012-14 from the 2010 panel). Our models include robust standard errors to adjust for the possibility that some respondents may be included twice in these panels. Our analytical sample includes 2,120 individuals who were married at time 1 of these panel and did not have missing information on any of our variables of interest.

### ***Measures***

*Outcome Variable.* The GSS collects a wide variety of information on respondent's marital status as well as quality of marriage. Current marital status is captured with a measure that includes the five categories: never married, married, divorced, separated, and widowed. Because we are interested in whether porn use leads to divorce, we have recoded this measure into a binary indicator of those who are currently married (= 0) or those who are currently divorced or separated (= 1). Throughout we will refer to this as divorce in order to conserve space. As we describe below, we limit our main analytical sample to those who are married at time 1 and model divorce at time 2.

*Change in Porn Viewership.* We measure pornography use with the GSS question: "Have you seen an X-rated movie in the last year?" We coded responses such that yes = 1, no = 0. Overall, 29.59 percent (N=1,641) of individuals report viewing an adult movie during at least one survey wave. To track change in porn viewership, we create a binary indicator to track change between panel waves. To capture beginning watching porn, we create an indicator that is

coded 1 if individuals did not watch porn at time 1 and did watch porn at time 2 and coded 0 for those who never watched porn at either wave. To capture discontinuing porn use, we create an indicator that is coded 1 if individuals did watch porn at time 1 and did not watch porn at time 2 and coded 0 for those who watched porn at each wave. Around 6.51 percent of individuals begin viewing pornography while 8.17 percent stop viewing pornography across these panels.

Our analyses focus on change in porn viewership across panel waves, so we have two basic “treatments” that we test. The first is the association between becoming a porn watcher and divorce. To capture this we focus in on the sample of those individuals who did not view pornography at time 1 and were married at time 1. Within this sub-sample, we can then estimate a model that compares those individuals who became porn viewers at time 2 compared to those who never watched porn to determine whether this change is associated with time 2 differences in rates of divorce. We then reverse this procedure by focusing on individuals who viewed pornography at time 1 and then comparing those who stop viewing pornography to those who continued to watch pornography to see how this is associated with time 2 divorce rates.

*Balancing Variables.* In order to isolate the association between change in porn viewership and likelihood of divorce, we create a balanced sample where those who change porn viewership look as much like those who do not change across our panels as possible. While we describe our analytical approach to balancing below, we create the following balancing variables to implement our strategy. We balanced on available measures of family structure and experience, religiosity, and demographics factors at time 1 that have consistently been shown to affect marital stability. Divorce is more common among married persons who have no children, have been divorced before, and have parents who divorced (Amato, 2010; Waite & Lillard, 1991). Thus, we include binary measures of whether the married respondent is a parent (yes = 1,

no = 0); has previously been divorced (yes = 1, no = 0); or as a child, had divorced parents (yes = 1, no = 0). Marital happiness is also related to divorce (Amato, 2010; Amato & Previti, 2003), and thus we also balance on the marital happiness of respondents at time 1. The GSS ask respondents, “Taking all things together, how would you describe your marriage? (1) very happy, (2) pretty happy, and (3) not too happy. We recode this into a binary indicator with 1 = very happy, 0 = everyone else. Because we cannot control for marital happiness at time 2 (because some respondents are divorced), we do not included marital happiness as a time 2 control. Nevertheless, all respondents are balanced on this factor.

Marital outcomes and religion are often strongly correlated (Mahoney, 2010; Perry, 2016), and we balance on respondent time 1 religiosity. The GSS asks respondents, “To what extent do you consider yourself a religious person? (1) very religious, (2) moderately religious, (3) slightly religious, and (4) not religious. We recode these into four dummy variables with “not religious” as the comparison group. We also balance on religious service attendance, with values from never attending (0) to attending more the once a week (8). While we prefer treating attendance as a continuous variable, we also interact a dummy variable of whether or not the respondent attends religious service every week or more to see if the association between watching porn and divorce varies among the religiously active (this coding follows Doran & Price, 2014). We also balance on religious affiliation using a modified version of the RELTRAD classification scheme (Schleifer & Chaves, 2017; Steensland et al., 2000). With our adjustments, we balance on four indicators for Conservative Protestants, Mainline Protestants, Catholics, and other religious traditions, with the religiously unaffiliated as the comparison group.

To account for variation in divorce rates across key demographic factors (Amato, 2010; Amato & Previti, 2003; Mahoney, 2011), we also balance on completion of a bachelor’s degree

(less than = 0, completed = 1), completion of an advanced degree (less than = 0, completed = 1), gender (male = 0, female = 1), age (in years), being black (not black = 0, black = 1), being other race (not other race = 0, other race = 1), region (south = 1, other = 0), and whether the respondent lives in a city (urban = 1, other = 0). Income also affects marital outcomes and so we include a continuous measure of equivalized household income, which takes the log of household income and divides it by the square root of the total number of household members (see Brady, 2009). Among all covariates, only the household income measure has a large number of missing cases (12 percent missing). We imputed the missing income with a model that includes education, gender, race, age, marital status, and urban residence ( $R^2 = .24$ ). Ultimately, our models are robust to the exclusion of income and when we implement a listwise deletion missing strategy with our income measure, the general pattern and magnitude of our associations are the same.

### *Analytical Strategy*

We use a balancing strategy to isolate the association between change in porn viewership and divorce across our 2-wave panels. Like other matching approaches, balancing creates a sample that mimics the isolation of our “treatment” condition that we might find with a randomized experiment. This is achieved by creating a series of proportional survey weights that, when applied, create a sample that is virtually indistinguishable across the balancing covariates for both the treatment and control groups. Our strategy involves balancing our “treatment” (change in porn use) and control groups for our treatment conditions. This strategy effectively accounts for any systematic differences at time 1 between those who did or did not view porn (thus mimicking random assignment to a “treatment”). The possibility remains, however, that other changes occurred across survey waves that may account for the change in porn viewership as well as the change in marital outcomes. To account for this, some of the regression models we

present include our balancing indicators as time 2 control variables. These control variables will only capture change across waves because our subsamples have been balanced across these same covariates at time 1. This creates a doubly robust approach to capture the associations between our treatment conditions and our marital outcomes.

Our rationales for choosing this approach over more traditional approaches to longitudinal data analyses are theoretical, conceptual, and empirical. Theoretically, this approach is intended to isolate particular types of change over time to better capture any potential association between beginning or stopping porn use and probability of divorce in order to address our research questions. By treating these specific changes as a type of treatment variable, we are able to focus on discrete forms of change and isolate our particular comparison group of interest (here individuals who are married at time 1) all of which better addresses our theoretical concerns. Conceptually, since our panel only captures discrete four year periods of time, we do not expect to capture large divorce rates over such a short panel. This current approach is less dependent on large rates of within individual change and therefore better able to capture potential difference given such a small numbers of divorce over these panels. Empirically, since more traditional forms of longitudinal analysis rely on within-individual change, a non-significant association may be the result of a lack of *the amount of* change captured in a panel as opposed to a lack of association in the population.<sup>2</sup>

We balance our samples using the entropy balancing proposed by Hainmueller (2012).

This approach balances these subsamples across “treatment” condition by implementing a series

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<sup>2</sup> As a robustness check, we ran fixed-effects models on our data to see if we could capture an association between change in porn viewership and change in divorce status in this less focused approach. We were able to capture significant difference in the association between change in porn viewership and change in divorce status. Though the associations were marginal ( $p < .07$ ), we believe the main reason for this is the overall lack of within-individual variation on divorce in this panel. Our approach enjoys the benefits of fixed-effects models without the drawback of requiring greater within-individual variation.

of weights for the control group that adjusts the means, variances, and skew of the balancing variables to be similar within an adjustable tolerance (here .05). Table 1 displays the means, variances, and skews of all of our balancing covariates with and without entropy balancing weighting, demonstrating that the entropy weighting strategy produces extraordinary balance across groups for all observed covariates. This increases our confidence that any differences we detect in the time 2 probability of divorce are not due to differences between those who did or did not view porn at time 1. Tables 2-3 present a series of logistic regression models controlling for time 2 information while balancing our data using the weighting variable produced by the entropy balancing procedure. Our full models will be balanced on all of our balancing variables. However, we are also interested in whether the association between becoming a porn viewer and divorce differs across gender, age, religiosity, and marital happiness. For these models, we create new balancing weights that do not balance on these conditions at time 1. We then interact each factor with beginning porn use to see how the associations are moderated.

## **Results**

Table 2 presents logistic regression models estimating the log odds of getting divorced at time 2 among persons who started viewing porn between waves (Models 1 and 2) and among person who stopped viewing porn between waves (Models 3 and 4). Model 1 shows that persons who were married at time 1 and began watching pornography between waves were roughly twice as likely to be divorced by time 2 as those who did not watch pornography ( $b = .78$ ;  $OR = 2.19$ ;  $p < .05$ ). In terms of predicted probabilities, married persons who did not begin viewing pornography show a predicted probability of divorce of about 6 percent holding time 2 covariates constant. This is compared to the 11 percent predicted probability of divorce among the individual who began viewing porn. While this difference might not seem particularly large, it



should be kept in mind that the likelihood of divorce is nearly doubling over a 2 year time period and is robust even when respondents are balanced on time 1 covariates and time 2 covariates have been held constant. Thus, our first hypothesis is strongly supported. Model 2 tests the interaction for gender which is statistically non-significant, suggesting that the association between beginning porn use between waves and the likelihood of divorce is not significantly different for men and women. Our third hypothesis that viewing pornography would be more strongly associated with divorce for men than for women is not supported.

What happens to the likelihood of divorce for married persons who stop watching porn between waves? Model 3 shows that married persons who leave pornography between survey waves were not significantly less likely to be divorced by time 2. This non-significant main association, however, is due primarily to strong gender differences in the association between discontinuing porn use and becoming divorced. The significant interaction with gender in Model 4 suggest that women who quit pornography between waves are significantly less likely to get a divorce compared to men ( $b = -1.90$ ;  $OR = .15$ ;  $p < .05$ ). Our second hypothesis that pornography cessation would predict a lower probability of divorce is thus affirmed for women, but not for men. This also contradicts our third hypothesis, in that women's likelihood of divorce seems more strongly associated with their cessation of porn use compared to men.

Figure 1 illustrates the relationships between both beginning or ceasing porn use and likelihood of divorce by gender. The top row shows the link between becoming a porn viewer and the probability of divorce. Among men, about 10 percent who begin viewing porn get divorced at time 2 compared to only about 5 percent of those who never watch porn. For women, the difference is considerably greater. About 6 percent of women who never watch porn get divorced between waves compared to 16 percent of those who began watching porn. While the

difference between men and women is not statistically significant in Table 2, women's odds of being divorced seem slightly more associated with the introduction of pornography compared to men. Patterns in the second row show opposite trends for men and women, likely explaining the significant gender interaction in Table 2. For married men who viewed porn at time 1, the probability of divorce does not differ significantly for those who left porn (though it appears to increase slightly for those who left porn, this is not to a significant degree). Among women, however, there is a negative association between discontinuing pornography use and divorce. Of those women who continue to watch porn during both survey waves, 18 percent are predicted to be divorced at time 2, compared only 6 percent of those who stopped viewing porn. Overall, these figures suggest that women who watch pornography get divorced at higher rates than men.

Table 3 presents three interaction models. The first model includes the interaction term for pornography use and age, which is significant and negative ( $b = -.11$ ;  $OR = .90$ ;  $p < .05$ ), indicating that the positive association between porn use and divorce declines with age. This supports our fourth hypothesis. Figure 2 visually presents this moderating association by plotting the association between becoming a porn viewer and divorce at five year intervals of age from 20 to 80 years old. This model predicts that married individuals who are 20 years old show the largest association between becoming a porn viewer and rates of divorce. Individuals who are 20 years old and do not begin consuming porn have about a 6 percent probability of getting divorced while those who do add porn at this age have a 51 percent probability of getting divorced. This is a 46 percentage point difference in predicted chances of divorce; for these younger individuals, the majority of those who begin viewing porn are predicted to be divorced at time 2. Among 30 year-olds, those who add porn show a predicted probability of divorce of about 28 percent and the 40 year-old who begins viewing porn shows a 12 percent probability of

divorce. For those 50 years old or older, this model no longer predicts a meaningful difference in the probability of divorced among those who become porn consumers and those who do not.

The next interaction model shows how the association between becoming a porn user and divorce may vary between persons who attend religious services more or less often. Because both the predictor of interest (beginning pornography use) and moderator (at least weekly attendance) are binary, the association between beginning to watch pornography and divorce in the model represents the conditional association for someone who does not attend services weekly; the association between weekly attendance and divorce is the conditional association of attendance for someone who does not view pornography; and the interaction term is the association between beginning pornography and divorce for someone who attends services weekly. Beginning pornography use is statistically significant ( $b = .83$ ;  $OR = 2.30$ ;  $p < .05$ ), which indicates that the positive association between beginning pornography and being divorced is only significant for those who do not attend religious services weekly (Grace-Martin, 2013). This contradicts our fifth hypothesis. Figure 3 (top panel) illustrates how those who are *not* weekly attenders have a significant difference in predicted probability of divorce between those who never watch porn and those who become porn viewers. Those who never watch pornography and are not particularly active religiously only show about a 6 percent probability of getting divorced, while those who began watching porn saw their chance of divorce double to around 12 percent. These patterns here mimic what we saw in our full models that were not decomposed by weekly religious service attendance. Among weekly attenders, however, we see that there is virtually no difference in the predicted probability of divorce among those who never watch porn and those who become porn viewers. For those who do not watch porn, about 5 percent get divorced between waves compared to 6 percent for those who do watch porn.

The final model includes our interaction term for beginning pornography use and whether respondents were “very happy” with their marriage at time 1. The interaction term is significant and positive ( $b = 1.40$ ;  $OR = 4.07$ ;  $p < .05$ ), indicating that the association between beginning pornography use and likelihood of divorce is stronger for those who reported greater initial happiness with their marriage. The bottom panel in Figure 3 shows the difference in time 2 divorce rates for individuals who were not very happy in their marriage at time 1 compared to those who were very happy by whether they began viewing porn between waves. The left side shows that those who were not very happy in their marriage at time 1 have a similar likelihood of divorce whether or not they begin viewing pornography. About 11 percent of those who begin viewing porn are predicted to get divorced compared to around 9 percent of those who never watch porn. For those who are “very happy” in their marriage initially, those who never viewed pornography are considerably less likely than those who began pornography to get divorced. Among these individuals, 12 percent who begin viewing porn are expected to get divorced while only 3 percent of those who never watch porn are expected to leave their marriage.

### **Discussion and Conclusions**

Our study is the first to examine how viewing pornography could be associated with marital stability using data that are nationally representative and longitudinal. Using a doubly robust approach that allows us to isolate the longitudinal association between viewing pornography and likelihood of divorce, we find that the likelihood of divorce roughly doubles for those who begin pornography use between waves. While this association looks slightly stronger for women in terms of predicted probabilities, men and women did not differ significantly from one another. Conversely, we found that ending porn use was associated with a lower likelihood of divorce, but only for women. Our consideration of other potential moderators shows that the

positive association between pornography use and divorce is stronger for younger Americans, those who were not especially religious, and those who reported higher initial marital happiness.

While the GSS panel data allow us to establish a robust link between pornography use and divorce over time, several important data limitations must be acknowledged to qualify and direct our interpretation of these findings and chart a path for future research. First, while our dichotomous measure of pornography use has considerable precedent in previous longitudinal analyses of pornography's association with other outcomes (e.g., Wright, 2013b, 2013c; Wright & Bae, 2013; Wright & Randall, 2014), we unfortunately cannot know whether it was married Americans' exposure to *any* pornography or *certain levels* of pornography use that was primarily associated increased likelihood of divorce. Yet, this could also be taken as evidence of the potentially strong link between pornography use and marriage outcomes. Because our measure of porn use only tells us whether respondents' viewed *any* pornography between waves, the results could be masking that porn use has an extremely deleterious influence on marriage for the most frequent consumers (see Perry, 2017a). Our findings are thus more conservative in this regard. A related limitation is that "pornography" can take a variety of forms and the GSS term "X-rated video," does not indicate what sort of sexual activities were viewed. Moreover, though Americans almost certainly recognize what terms like "X-rated" and "XXX" mean (MacInnis & Hodson, 2015), and the GSS pornography use measure has also been used in a number of influential studies in this journal since 2013 (Kohut et al., 2016; Price et al., 2016; Regnerus et al., 2016; Wright, 2013a), "X-rated video" is admittedly a dated way to refer to pornographic content. The framers of the GSS have opted to maintain continuity with previous decades rather than update the question. Future quantitative research on this topic would ideally utilize questions that reflect the variety of pornographic material that might be watched and how often.

Third, our data only provide information for one spouse when dyadic data would be ideal in order to understand whether only one partner was viewing pornography, or whether both spouses view pornography individually or together (Maddox et al., 2011; Willoughby et al., 2016). Moreover, qualitative interviews with both spouses would be optimal in order to understand how pornography was used, how this use was interpreted by both spouses, and what role it played in the relationship, and perhaps, their eventual breakup.

Lastly, it should also be acknowledged that there are alternative explanations that cannot be ruled out by our data or methodological approach. One obvious possibility is reverse-causation, that persons who divorced between survey waves started viewing pornography as a result of the divorce, not the other way around. While our modeling strategy seeks to mitigate this possibility by both controlling for marital happiness and balancing groups to make porn watchers and non-porn watchers as similar as possible, we cannot rule this out as a possibility. Another possibility is that there are intervening mechanisms at work that our study has not controlled for, most notably, respondents' sexual frequency or satisfaction at time 1. Married persons who were unsatisfied sexually at time 1 would be more likely to seek out pornography and be divorced by time 2 (Yabiku & Gager, 2009). Unfortunately, our study is unable to account for this factor directly, but only indirectly by controlling for general marital happiness.

While these alternative possibilities cannot be ruled out completely, our general finding is consistent with previous research on pornography and committed romantic relationships. Despite exceptions where erotic media are used as a part of love-making and thus may yield positive returns, the majority of studies find that pornography use is negatively associated with various measures of relationship quality for married or dating couples (Campbell & Kohut, 2016; Perry, 2017a). Our findings extend this research and add that pornography use is also associated with

the eventual breakup of marriages. Yet, our results turned up several surprises regarding the social circumstances under which beginning porn use had the strongest association with divorce.

Our findings that beginning porn use was *not* more strongly associated with divorce for men compared to women, and that discontinuing porn use was only negatively associated with divorce for women, are both noteworthy because of previous empirical findings. The majority of studies have found men's relationship quality to be more strongly, negatively associated with pornography use compared to women who often report higher relational or sexual satisfaction associated with pornography use, possibly owing to greater intimacy and education it may provide (Bridges & Morokoff, 2011; Perry, 2017a; Poulsen et al., 2013). Our study, however, finds that married women who discontinued pornography use saw their likelihood of divorce decline by two-thirds compared to no reduction for men. It could be that porn use is associated with weakened marital attachment for women more so than men. As married men tend to view pornography in greater amounts than women (Perry, 2016), it is possible they see porn use as something they can compartmentalize and keep separate from the relationship, whereas for women, who tend to view pornography less often, the introduction of pornography may signal more in terms of relationship quality. An alternative theory is that the women who started watching porn between waves were doing so because they were in an extramarital affair (Doran & Price, 2014; Stack et al., 2004). In this case, the introduction of porn and divorce for these women were both the results of a relationship already in decline. Conversely, their discontinuing porn use may have indicated that they discontinued the affair and this reduced the probability of divorce. Ultimately, qualitative interviews would be useful to flesh out specific processes here.

Though also contrary to our expectation, the fact that beginning pornography use was more strongly associated with divorce for those who were less religious makes sense in light of

research suggesting that religion serves to protect against divorce through the mechanisms of social control and internalized moral values (Amato, 2010; Mahoney, 2010; Wright, 2013b, 2013c; Wright et al., 2014). While being embedded within a religious community may increase the social or psychic costs of porn consumption and thus affect marital *quality* more severely than for those who are less religious (Doran & Price, 2014; Perry, 2016), it may also be a social and psychic deterrent to marital dissolution regardless of whether pornography is being used.

Our finding that the association between beginning pornography use and divorce was stronger for younger Americans may be partly attributable to the fact that, relative to older Americans, younger Americans have been exposed to different cultural attitudes toward divorce and different divorce likelihoods, thus normalizing it somewhat. Conversely, older Americans tend to be more established in their marriages because of time already invested, and they tend to view pornography in lower frequencies. This latter pattern may change somewhat as future cohorts, having had lifelong access to the Internet, marry and proceed through the life course. If cohorts, as they grow older, start to maintain their pornography use as younger cohorts seem to be (see Price et al., 2016), it is possible that age will have less of a protective effect on marriage.

Lastly, our finding illustrated in Figure 2 that persons who were “very happy” in their marriage initially and never began watching porn were less likely to divorce compared to those who did watch porn could be interpreted differently depending on the ordering of events. It could be that, for those in happier marriages, one spouse’s pornography use may cause a sharp decline in happiness and eventual dissolution, perhaps if it is discovered unexpectedly and viewed as a type of infidelity. Conversely, it could also be that marital happiness started to decline sharply between waves for some reason and contributed to both the pornography use and the divorce. Again, future qualitative research on this topic could help unpack these relationships.



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Table 1: Weighted and Unweighted Descriptive Statistics for Married Individuals Who Did Not Watch Porn at Time 1. The Treatment is Beginning to Watch Pornography Between Waves.

Measures	Unweighted Groups						Weighted Group		
	Treatment Group (began porn)			Control Group (no porn)			Control Group (no porn)		
	Mean or %	Var.	Skew	Mean or %	Var.	Skew	Mean or %	Var.	Skew
<b>Family Measures</b>									
Ever had a Child	86%	0.12	-2.03	89%	0.10	-2.44	86%	0.12	-2.02
Previously Divorced	29%	0.21	0.94	24%	0.18	1.21	29%	0.21	0.93
Parents Divorced	15%	0.13	1.95	13%	0.11	2.25	15%	0.13	1.93
Very Happy in Marriage	52%	0.25	-0.09	61%	0.24	-0.45	52%	0.25	-0.09
<b>Religious Measures</b>									
Religious Attendance	3.13	7.82	0.40	4.21	8.07	-0.19	3.13	7.82	0.40
Religiousness	1.35	0.95	0.11	1.78	0.90	-0.44	1.34	0.95	0.11
<b>Religious Tradition</b>									
Conservative Protestant	37%	0.23	0.55	38%	0.24	0.51	37%	0.23	0.55
Mainline Protestant	11%	0.10	2.53	18%	0.15	1.63	11%	0.10	2.51
Catholic	19%	0.16	1.55	24%	0.18	1.23	20%	0.16	1.53
Other Tradition	9%	0.08	2.95	7%	0.07	3.29	9%	0.08	2.94
<b>Education</b>									
Junior College Degree	09%	0.08	2.95	8%	0.08	3.00	9%	0.08	2.94
Bachelor's Degree	18%	0.15	1.67	22%	0.17	1.35	18%	0.15	1.65
Advanced Degree	12%	0.10	2.41	14%	0.12	2.04	12%	0.10	2.40
<b>Demographics</b>									
Age	45.22	157	0.35	51.36	218	0.16	45.22	157	0.35
Family Income (log)	10.57	0.68	-0.81	10.67	0.64	-1.35	10.57	0.68	-0.78
Female	37%	0.23	0.55	58%	0.24	-0.34	37%	0.23	0.55
<b>Race</b>									
Black	14%	0.12	2.03	7%	0.06	3.42	15%	0.12	2.02
Other Race	12%	0.11	2.31	7%	0.07	3.26	12%	0.11	2.29
<b>South</b>									
South	40%	0.24	0.43	38%	0.24	0.49	40%	0.24	0.42
<b>Urban</b>									
Urban	56%	0.25	-0.25	54%	0.25	-0.15	56%	0.25	-0.24

Table 2: Entropy Balanced Logistic Regressions of Divorce on Change in Porn Viewership

Predictors	Began Watching Porn <sup>1</sup>						Stopped Watching Porn <sup>2</sup>					
	Coef.	Model 1		Coef.	Model 2 <sup>3</sup>		Coef.	Model 3		Coef.	Model 4 <sup>3</sup>	
		OR	95% CI		OR	95% CI		OR	95% CI		OR	95% CI
Change in Porn Viewership												
Began Watching Porn	0.78*	2.19	[0.1,1.4]	0.61	1.84	[-0.3,1.5]						
Stopped Watching Porn							-0.17	0.85	[-1.0,0.6]	0.63	1.89	[-0.3,1.6]
Female	0.12	1.13	[-0.7,0.9]	-0.12	0.89	[-0.8,0.6]	0.01	1.01	[-0.8,0.8]	0.91	2.48	[-0.2,2.0]
Interactions												
Began Watching Porn*Female				0.42	1.52	[-1.0,1.8]						
Stopped Watching Porn*Female										-1.90*	0.15	[-3.6,-0.2]
Ever had a Child	-0.21	0.81	[-1.2,0.8]	-0.19	0.83	[-1.2,0.8]	-0.58	0.56	[-1.5,0.4]	-0.62	0.54	[-1.6,0.3]
Parents Ever Divorced	0.31	1.37	[-0.5,1.2]	0.25	1.28	[-0.6,1.1]	0.06	1.06	[-0.8,0.9]	0.01	1.01	[-0.8,0.8]
Slightly Religious <sup>4</sup>	0.15	1.16	[-0.9,1.2]	-0.02	0.98	[-1.0,1.0]	-0.62	0.54	[-1.9,0.6]	-0.74	0.48	[-2.0,0.5]
Moderately Religious <sup>4</sup>	-0.04	0.96	[-1.1,1.0]	-0.11	0.89	[-1.2,1.0]	-0.58	0.56	[-1.9,0.7]	-0.70	0.50	[-2.0,0.6]
Very Religious <sup>4</sup>	-0.37	0.69	[-1.7,0.9]	-0.56	0.57	[-1.9,0.8]	-0.37	0.69	[-2.2,1.5]	-0.60	0.55	[-2.4,1.2]
Religious Service Attendance	-0.09	0.91	[-0.3,0.1]	-0.05	0.96	[-0.2,0.1]	-0.03	0.97	[-0.3,0.2]	-0.03	0.97	[-0.2,0.2]
Conservative Protestants <sup>4</sup>	0.43	1.54	[-0.6,1.5]	0.39	1.48	[-0.7,1.4]	0.82	2.26	[-0.5,2.2]	0.84	2.33	[-0.5,2.2]
Mainline Protestants <sup>4</sup>	0.44	1.55	[-1.0,1.8]	0.46	1.58	[-1.0,1.9]	-0.59	0.56	[-3.3,2.1]	-0.52	0.59	[-3.5,2.5]
Catholics <sup>4</sup>	0.12	1.13	[-1.2,1.5]	0.01	1.01	[-1.3,1.4]	0.71	2.04	[-0.7,2.2]	0.74	2.11	[-0.7,2.2]
Other Religious Traditions <sup>4</sup>	-0.76	0.47	[-2.7,1.2]	-0.95	0.39	[-2.7,0.8]	0.26	1.29	[-1.4,1.9]	0.42	1.52	[-1.2,2.1]
Bachelor's Degree <sup>4</sup>	0.36	1.44	[-0.5,1.2]	0.30	1.35	[-0.6,1.2]	0.78	2.19	[-0.2,1.8]	0.86	2.36	[-0.2,1.9]
Advanced Degree <sup>4</sup>	-0.81	0.44	[-2.3,0.7]	-0.81	0.44	[-2.0,0.4]	0.94	2.56	[-0.9,2.7]	0.95	2.60	[-0.8,2.8]
Age	-0.06**	0.94	[-0.1,-0.0]	-0.06**	0.94	[-0.1,-0.0]	-0.02	0.98	[-0.1,0.0]	-0.02	0.98	[-0.1,0.0]
Equalized Household Income <sup>5</sup>	-0.47*	0.62	[-0.9,-0.0]	-0.42	0.66	[-0.9,0.0]	-0.66**	0.52	[-1.1,-0.3]	-0.67**	0.51	[-1.1,-0.2]
Black <sup>4</sup>	0.16	1.17	[-0.8,1.1]	0.15	1.16	[-0.8,1.1]	-0.17	0.85	[-1.4,1.1]	-0.28	0.75	[-1.7,1.1]
Other Race <sup>4</sup>	0.14	1.16	[-1.3,1.6]	0.20	1.22	[-1.2,1.6]	0.41	1.51	[-0.8,1.7]	0.40	1.49	[-0.8,1.6]
South	0.13	1.13	[-0.7,0.9]	0.00	1.00	[-0.8,0.8]	-0.29	0.75	[-1.2,0.7]	-0.31	0.74	[-1.2,0.6]
Urban	-0.25	0.78	[-1.0,0.4]	-0.30	0.74	[-1.0,0.4]	-0.04	0.96	[-1.0,0.9]	0.06	1.06	[-0.9,1.0]
<i>N</i>	2,120						441					

Coefficients reported in logged odds; OR = odds ratio; 95% confidence intervals in parenthesis; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

<sup>1</sup> These model are balanced on time 1 covariates between the treatment group (those who did not watched porn at time 1 but began watching porn at time 2) and the control group (those who did not watch porn at either time 1 or time 2). This sample includes those who were married and did not watch porn at time1.

<sup>2</sup> These model are balanced on time 1 covariates between the treatment group (those who watched porn at time 1 but did not watch porn at time 2) and the control group (those who watched porn at either time 1 or time 2). This sample includes those who were married and watched porn at time1.

<sup>3</sup> There gender interaction models are not balanced on time 1 gender to see if men and women have different associations between change in porn viewership and likelihood of divorce.

<sup>4</sup> Comparison groups are “Not Religious”, “Not Religiously Affiliated”, “Less Than Bachelors”, and “White”, respectively.

<sup>6</sup> Here household income is logged and divided by the square root of the total number of household members

Table 3: Entropy Balanced Logistic Regression of Divorce on Beginning Pornography Use by Age, Religious Attendance, and Marital Happiness<sup>1</sup>

Predictors	Age Interaction Model <sup>1,2</sup>			Religious Attendance Interaction Model <sup>1,3</sup>			Lagged Marital Happiness Interaction Model <sup>1,4</sup>		
	Coef.	OR	95% CI	Coef.	OR	95% CI	Coef.	OR	95% CI
Began Watching Porn	5.10**	163.3	[1.5, 8.7]	0.83*	2.30	[0.1,1.5]	0.18	1.20	[-0.7, 1.1]
Main Effects									
Female	0.21	1.23	[-0.6, 1.1]	0.16	1.17	[-0.6, 1.0]	0.09	1.09	[-0.7, 0.9]
Age	-0.00	1.00	[-0.0, 0.0]	-0.06**	0.95	[-0.1,-0.0]	-0.06**	0.94	[-0.1,-0.0]
Religious Service Attendance (Weekly)				-0.20	0.82	[-1.2, 0.8]			
Very Happy in Marriage (Time1)							-1.25**	0.29	[-2.1,-0.4]
Interactions									
Began Porn*Age	-0.11*	0.90	[-0.2,-0.0]						
Began Porn*Weekly Attendance				-0.59	0.56	[-2.8, 1.7]			
Began Porn*Marital Happiness (Time 1)							1.40*	4.07	[0.2, 2.6]
<i>N</i>	2120			2122			2120		

Coefficients reported in logged odds; OR = odds ratio; 95% confidence intervals in parenthesis; \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

<sup>1</sup> Each model includes all time 2 controls included in Table 2. These are excluded in order to conserve space.

<sup>2</sup> Here the models are balanced on time 1 covariates between the treatment group (those who did not watch porn at time 1 but did watch porn at time 2) and the control group (those who did not watch porn at either time 1 or time 2). This sample is limited to those who were married and did not watch porn at time 1. Because we are interested in age, we have not balanced on age in this model.

<sup>3</sup> These model are balanced on time 1 covariates between the treatment group (those who did not watch porn at time 1 but did watch porn at time 2) and the control group (those who did not watch porn at either time 1 or time 2). This sample is limited to those who were married and did not watch porn at time 1. Because we are interested in religious services attendance, we have not balanced on attendance in this model.

<sup>4</sup> These model are balanced on time 1 covariates between the treatment group (those who did not watch porn at time 1 but did watch porn at time 2) and the control group (those who did not watch porn at either time 1 or time 2). This sample is limited to those who were married and did not watch porn at time 1. Because we are interested in marital happiness, we have not balanced on happiness in this model.



Figure 1: Predicted Probability of Divorce on Change in Porn Viewership by Gender.

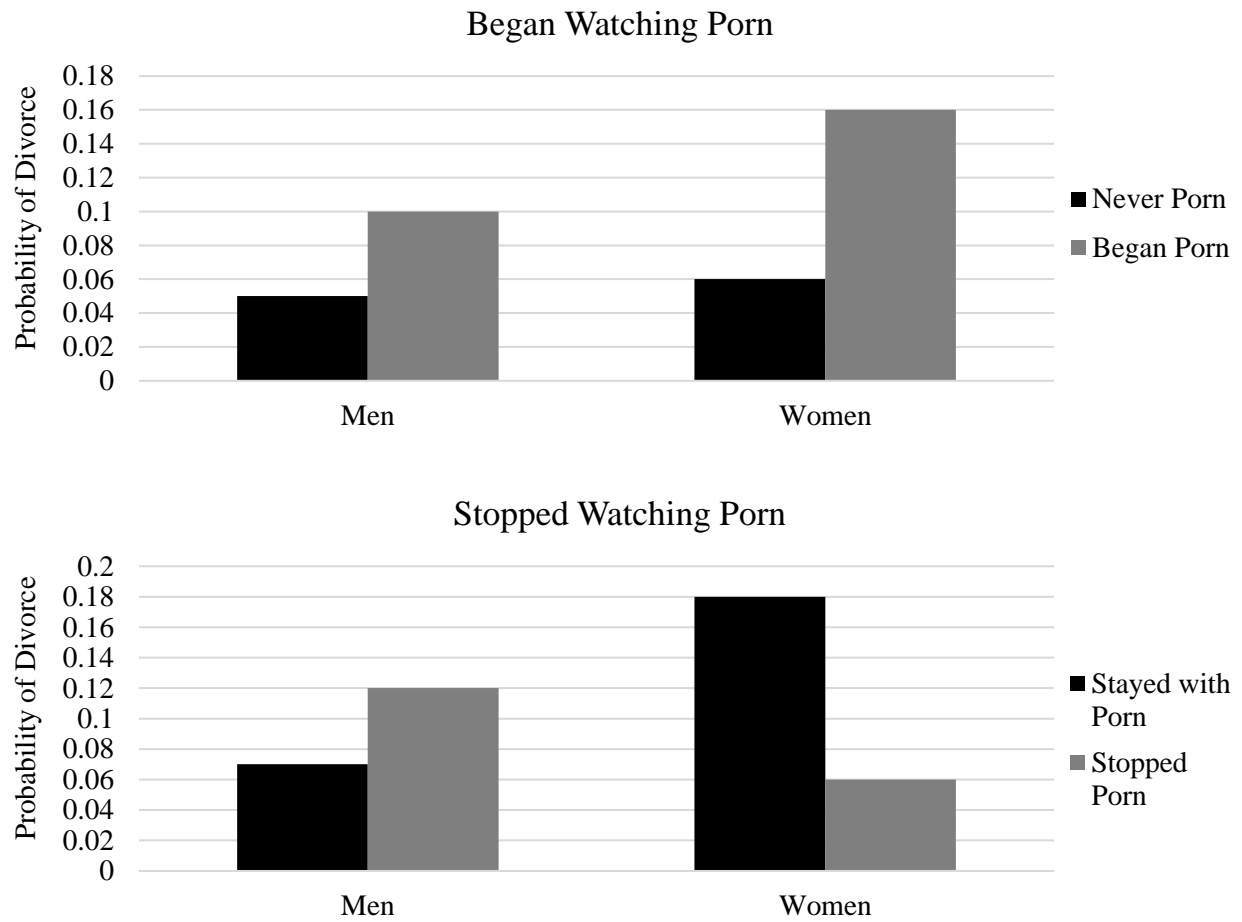


Figure 2: Probability of Divorce on Beginning to Watch Porn across Age.

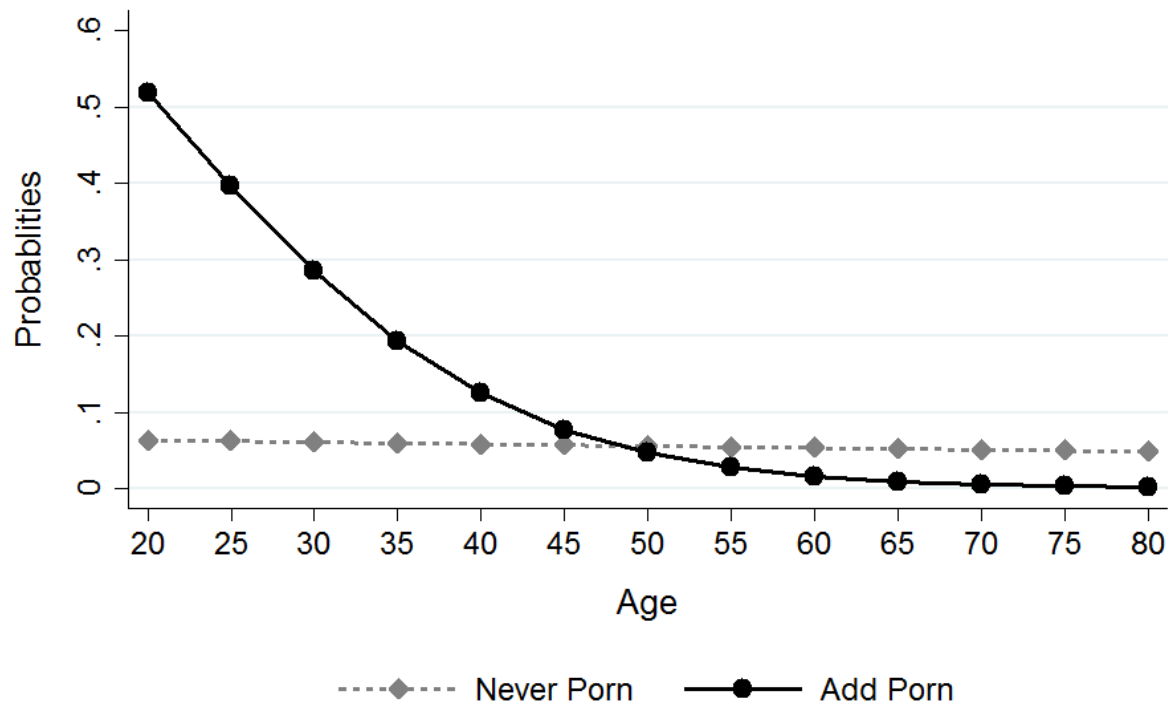


Figure 3: Predicted Probability of Divorce on Beginning to Watch Porn by Weekly Religious Service Attendance and Earlier Marital Happiness

