

# A National Prospective Study of Pornography Consumption and Gendered Attitudes Toward Women

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**Abstract** Whether consuming pornography leads to gendered attitudes toward women has been debated extensively. Researchers have primarily studied pornography's contribution to gendered sexual attitudes such as rape myth acceptance and sexual callousness toward women. The present study explored associations between pornography consumption and nonsexual gender-role attitudes in a national, two-wave panel sample of US adults. Pornography consumption interacted with age to predict gender-role attitudes. Specifically, pornography consumption at wave one predicted more gendered attitudes at wave two for older—but not for younger—adults. Gender-role attitudes at wave one were included in this analysis. Pornography consumption was therefore associated with interindividual over time change in older adults' gendered attitudes toward women. Older adults' attitudes toward nonsexual gender roles are generally more regressive than those of younger adults. Thus, this finding is consistent with Wright's (Commun Yearb 35:343–386, 2011) script acquisition, activation, application model ( $_3AM$ ) of media socialization, which posits that attitude change following media exposure is more likely for viewers' whose preexisting behavioral scripts are less incongruous with scripts for behavior presented in mass media depictions. Contrary to the perspective that selective exposure explains associations between pornography consumption and content-congruent attitudes, gender-role attitudes at wave one did not predict pornography consumption at wave two.

**Keywords** Pornography · Gender-roles · Socialization · Selective exposure ·  $_3AM$

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## Introduction

Content analytic studies consistently find that entertainment media depicting nudity and explicit sexual acts designed to sexually arouse the consumer (i.e., pornography—Wright et al. 2012) tend to portray women in general and women in male–female interactions in particular in gender-stereotypic ways (Barron and Kimmel 2000; Bridges et al. 2010; Brosius et al. 1993; Cowan et al. 1988; Gorman et al. 2010; Jensen 2007; Matacin and Burger 1987; Monk-Turner and Purcell 1999; Palys 1986; Prince 1990; Sun et al. 2008; Winick 1985; Yang and Linz 1990). Experiments and surveys designed to provide insight into whether viewing pornography affects attitudes toward women have primarily focused on sexual attitudes such as rape myth acceptance, sexual callousness, and sexual objectification (Hald et al. 2010; Linz et al. 1984; McKenzie-Mohr and Zanna 1990; Peter and Valkenburg 2007; Zillmann and Bryant 1982). Such efforts are justified and laudable. However, pornography may also affect general, nonsexual attitudes toward women. Jansma et al. (1997) contend that gendered beliefs about women due to pornography consumption are not restricted to attitudes regarding sexuality. Frable et al. (1997) argue that pornographic socialization contributes to a wide range of beliefs about men, women, and relations between men and women.

Brown and L’Engle (2009) recently stressed the need for research on pornography and gender, specifically noting the lack of research on gender-role attitudes. Data are needed that evaluate whether people who currently view pornography express more gendered attitudes at a later time point than people who do not currently view pornography (Peter and Valkenburg 2007). Data are also needed that evaluate whether associations between pornography consumption and gendered attitudes are simply due to selective exposure (i.e., to people with a gendered worldview selecting content congruent with their perspective) (D’Alessio and Allen 2007).

The present study responds to these calls. Using national longitudinal data gathered in 2008 (T1) and 2010 (T2) by the General Social Survey (GSS) (Davis and Smith 2010), prospective associations between US adults’ consumption of pornography and gendered attitudes toward women are investigated. Age is explored as a moderating factor, given recent longitudinal findings suggesting that attitude change following exposure to pornography—including gender-role attitude change—is more likely for some age cohorts than others (Peter and Valkenburg 2011a; Wright 2014; Tokunaga et al. 2014). The GSS is a national, personal interview survey examining the social beliefs and behaviors of US adults aged 18 and older.

## Socialization, Pornography, and Gender-Role Attitudes<sup>1</sup>

Wright (2011) has developed a script acquisition, script activation, script application model (<sub>3</sub>AM) that articulates how consuming sexual media can affect social

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<sup>1</sup> Socialization processes are studied by academics from many disciplines. Sexually explicit media have drawn the attention of scholars from numerous fields. Gender-role research and scholarship is conducted across units in the social sciences and humanities. Numerous axiological, ontological, and epistemological perspectives have been brought to bear on these important areas of social inquiry. This paper operates

cognition. The  $_3$ AM has served as a theoretical referent in several recent studies of sexual media consumption and gendered attitudes (e.g., Malamuth et al. 2012; Wright et al. 2014a; Wright and Funk 2013; Wright and Tokunaga 2013). The  $_3$ AM integrates concepts from media, information processing, and behavioral theories including social cognitive theory (Bandura 2001), uses and gratifications (Rubin 2002), media dependency (Rubin and Windahl 1986), priming (Berkowitz and Rogers 1986), and cultivation (Gerbner et al. 1994). The  $_3$ AM draws primarily, however, from the script theorizing of Huesmann (Huesmann 1986; see also Huesmann 1988, 1998).

Scripts are symbolically imparted directives for human behavior (Abelson 1976). Sexual media may inform specific scripts or higher-order scripts (Huesmann 1986; Wright and Funk 2013; Wright et al. 2014b). Specific scripts reference specific behaviors in specific contexts. Higher-order scripts are comprised of general rules and principles for behavior. Higher-order scripts extend beyond specific acts and contexts. In sum, “a script may be closely associated with specific cues” or “may be an abstraction less connected to specific cues” (Huesmann 1998, p. 82). Observing media models can affect both the former and the latter script categories.

A specific scripting effect occurs when viewing a specific behavior in a specific context affects judgments regarding that particular behavior in that particular context. For example, if viewers’ belief that women unconsciously want their romantic partners to force sex on them strengthens following exposure to pornographic depictions of women ultimately enjoying forced sex on dates, a specific scripting effect has taken place (e.g., Malamuth and Check 1985; Peter and Valkenburg 2011a). As another example, if viewers’ belief that women would like to pose nude for pornographic media strengthens following exposure to naked centerfolds, a specific scripting effect has again taken place (e.g., Linz et al. 1988; Wright and Tokunaga 2013). In each of these instances, the belief affected is directly related to the behaviors that were observed.

A higher-order scripting effect takes place when consumers abstract the underlying belief system or philosophy guiding the specific behaviors they have observed and then use this generalized information to construct judgments of novel but conceptually related behaviors. According to Bandura (2001), “in this higher form of abstract modeling observers extract the rule governing the specific judgments or actions exhibited by others. Once they learn the rule they can use it to judge or generate new instances of behavior that go beyond what they have seen or heard” (p. 275). Effects on perceptions of general gender-roles from exposure to pornography would be indicative of higher-order scripting. In this case, the consumer would need to abstract the underlying philosophy of gender depicted and then apply this gendered script to judgments about appropriate behavior for women in asexual but gender-salient contexts. Following exposure to depictions of men as

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Footnote 1 continued

from a social scientific, social psychological perspective. Space constraints preclude a review of socialization, media, and gender-role research and scholarship across other methodological and disciplinary arenas. For examples of additional perspectives (e.g., from criminology, public health, cultural studies, media studies) on pornography, specifically, see Attwood (2004), Felson (1996), Jacobs (2004), Koop (1987), Langevin and Curnoe (2004), and Perrin et al. (2008).

sexually dominant and aggressive and women as sexually submissive and passive, for example, consumers' may deduce that men are better suited to competitive and hostile areas of social life (e.g., business and politics) than are women (e.g., Frable et al. 1997; Jansma et al. 1997; Mulac et al. 2002).

According to the  $\text{}_3\text{AM}$ , sexual media can provide consumers with scripts they were unaware of [acquisition], prime already acquired but currently dormant scripts [activation], and encourage the behavioral or attitudinal deployment of scripts [application] by portraying particular behaviors or patterns of behavior as normative and beneficial for the participants involved. Gendered scripts are normative in pornography. Frable et al. (1997) reviewed the literature and concluded that scripts in pornography tend to be "sex stereotyped...men are high-status professional, violent, and dominant; women are low-status housewives, nonviolent, and submissive" (p. 315). As one illustration, Cowan et al. (1988) analyzed at random pornographic movies widely available at neighborhood video stores. More than 75 % of movies featured scenes of dominance (i.e., one participant physically or verbally controlling the sexual behavior of another). Seventy-eight percent of the time men were the dominators. The majority of men were professionals or businessmen. The majority of women were clerical workers, housewives, or students. As another illustration, Brosius et al. (1993) analyzed at random a representative sample of pornographic movies released between 1979 and 1988. Women were depicted in positions subordinate to men (e.g., male boss- female secretary) more so than men were depicted in positions subordinate to women. As an additional illustration, Monk-Turner and Purcell (1999) analyzed a random sample of pornographic movies distributed by a national firm. Status inequality (e.g., male supervisor-female employee) was present in approximately one in five scenes and subordination (e.g., males ordering females to engage in desired behaviors) was present in more than one-third of scenes.

More recent studies of pornographic movies (Bridges et al. 2010; Sun et al. 2008) as well as studies of pornographic websites (Arakawa et al. 2012; Heider and Harp 2002) have found that gendered scripts remain common in pornography. Gorman et al. (2010), for example, analyzed videos selected at random from pornography websites providing free content. The websites were located using Google and popular search terms such as "porn" and "XXX." Women were depicted submitting to men (i.e., readily agreeing to do whatever men desired) in approximately half of the videos. Women were depicted as exploited by men (e.g., men using their older age or advanced social status to sexually exploit women) in about a quarter of the videos. In sum, available data suggest the normativeness of gendered portrayals in pornography.

Gendered dynamics are also portrayed as rewarding. Male dominance and female submission result in female gratification as well as male gratification. Bridges et al. (2010) analyzed a random sample of popular pornographic movies. Approximately 90 % of scenes contained acts of dominance such as hair pulling, slapping, and choking. Women were dominated nearly 95 % of the time, and just over 95 % of dominant acts resulted in overt pleasure (or no sign of displeasure) for the recipient. Using a similar coding scheme and sampling frame, Sun et al. (2008) explored whether this gendered dynamic differed depending on the director's gender. Male

dominant behavior over women was common regardless of the director's gender. As in Bridges et al. (2010), nearly all dominant acts resulted in overt pleasure (or no sign of displeasure) regardless of the directors' gender. Heider and Harp (2002) engaged in a rhetorical analysis of more than 200 pornographic websites over the period of a year. Sites were found using terms such as 'sex' in Internet search engines. They concluded that the sites depicted "a clear hierarchy, where men are in control and women must submit" but also signaled that "women are anxious to do so and actually desire to service any male" (p. 294).

Correspondingly, a few studies suggest that pornography may affect consumers' gender-role attitudes. In a cross-sectional US survey, Garcia (1986) found that collegiate men who consumed sexually explicit media with themes of dominance (i.e., coercion and aggression) expressed less progressive attitudes toward women in a variety of domains (e.g., women's vocational roles, freedom and independence, marital relationships). In a longitudinal survey, Brown and L'Engle (2009) found correlations between American boys and girls earlier exposure to pornographic movies, magazines, or websites and later gendered attitudes (e.g., that girls should not play competitive sports such as football and hockey). Experimentally, Zillmann and Bryant (1982, 1988) found that exposing American men and women to 'standard fare' pornography (i.e., pornography with typical scripts for oral, vaginal, or anal sex) decreased their support for the women's liberation movement and increased their perception that wives should acquiesce to the wishes of their husbands.

Correlations in pornography and gender-attitude studies have been modest in magnitude, however, and not all studies have found an association (Padgett et al. 1989). Media theorists in general (McGuire 2001; Potter 1993) and sexual media theorists in particular (Malamuth and Huppin 2005; Wright 2011) have argued that overall exposure-attitude associations are attenuated by individual differences. That is, socializing effects are more likely for some individuals than others. A recent longitudinal study by Peter and Valkenburg (2011a) indicates that older adults may be most susceptible to pornography's gendered content. Utilizing two-waves of data, this study found that earlier pornography consumption did not predict Dutch youths' later stereotypical beliefs about women's sexual roles, but did predict older adults' beliefs.

Although counter to conventional theorizing (which suggests that naivety and life inexperience render youth more susceptible to sexual media influence—Peter and Valkenburg 2011b), this finding is congruent with the  $\text{}_3\text{AM}$  tenet that lack of discord between individuals' preexisting beliefs and scripts for sex in media increases the probability of media influence (Wright 2011, 2013a, 2014). Studies consistently find that the beliefs of older individuals are more gendered than the beliefs of younger individuals (Ciabattari 2001; Dolan 2010; Helmreich et al. 1982; Mason and Lu 1988). A significant portion of this difference can be attributed to a cohort effect (Brooks and Bolzendahl 2004). Older cohorts of Americans tended to be reared in more gendered social milieus than younger cohorts of Americans. As older cohorts have passed away and been replaced by younger cohorts, attitudes in the US have become less gendered (Brooks and Bolzendahl 2004; but see also Cotter et al. 2011). Period influences such as prominent social movements can affect individuals

of all ages in a given time-interval, but a gendered social perspective is still more likely among older individuals than younger individuals. For instance, Ciabattari (2001) analyzed pre-baby boomers, baby boomers, and post-baby boomers' agreement with General Social Survey queries regarding women and domesticity, women and work, and women and disposition. Older cohorts' attitudes became more liberal over time but were also consistently more conservative than younger cohorts' attitudes within each decade analyzed (1970s, 1980s, 1990s).

To synthesize, gender-role research indicates that the beliefs of older individuals are more gendered than the beliefs of younger individuals. According to the  $\text{}_3\text{AM}$ , the application of sexual media scripts to attitudes is most likely when media's scripts are less incompatible with consumers' preexisting scripts. Consistent with this premise, a recent study has suggested that associations between pornography consumption and gendered beliefs are strongest for older consumers (Peter and Valkenburg 2011a). Thus, research on gender-role attitudes and age, the  $\text{}_3\text{AM}$ , and recent pornography research collectively suggest that the influence of pornography consumption on gender-role attitudes may be strongest among older adults.

## Alternative Explanations

### Selective Exposure

The preceding section presented the perspective that consuming pornography leads to shifts in attitudes toward pornography's presentation of sociality. In other words, the preceding section portrayed pornography as a socializing agent or a source of social learning.

The most frequent counter to the assertion that social learning processes explain correlations between pornography consumption and content-congruent attitudes is selective exposure (Frable et al. 1997; Garcia 1986; Lo and Wei 2005; Peter and Valkenburg 2007; Wright 2012a). The selective exposure perspective maintains that associations between exposure to pornography and content-congruent attitudes are due to intentional pornography consumption and avoidance, not socialization due to consuming pornography. Specifically, a selective exposure perspective contends that consumers choose media that is compatible with their preexisting attitudes and avoid media that is incompatible with their preexisting attitudes (D'Alessio and Allen 2007). To put it another way, a selective exposure perspective on media argues that people select media genres that reflect their preexisting beliefs and avoid media genres that challenge their preexisting beliefs. From this point of view, if people who consume pornography have more gendered attitudes than people who do not consume pornography, it is because people with gendered attitudes actively select pornography (since it confirms their beliefs) and people with egalitarian attitudes actively avoid pornography (since it contradicts their beliefs). In a longitudinal study, the selective exposure perspective would hypothesize that earlier gender-role attitudes would predict later pornography consumption, while earlier pornography consumption would not predict later gender-role attitudes.

### Third-Variable Confound

An additional alternative explanation for the finding that pornography exposure correlates with attitudes indicative of pornography's presentation of sociality is that such associations are due to a third-variable confound (Gunter 2002). A third-variable confound is a variable that is related to both the independent and dependent variables, and may therefore be responsible for any association found between the independent variable and dependent variable (Newton and Rudestam 1999).

As the strongest predictor of future attitudes is usually past attitudes and the selective exposure perspective contends that preexisting attitudes are responsible for pornography consumption, the most likely third-variable confound of an earlier pornography consumption—later gender-role attitudes correlation is earlier gender-role attitudes. Some pornography researchers analyzing longitudinal data control only for earlier attitudes (e.g., Peter and Valkenburg 2009), as the variability in later attitudes explained by other possible third-variables should be encapsulated by earlier attitudes. The present study controls for prior gender-role attitudes. To err on the side of methodological conservatism, however, the present study also controls for a number of additional confounds measured by the General Social Survey and suggested by the literature on pornography and gender.

Education is controlled because educated individuals may be less likely to consume pornography and less likely to hold gendered attitudes (Mason and Lu 1988; Stack et al. 2004). Ethnicity is controlled because of its association with pornography consumption and potential association with gender-role attitudes (Jones and Jacklin 1988; Wright 2013b). Gender is controlled because men may be more likely to consume pornography and more likely to hold gendered attitudes (Ciabattari 2001; Paul 2009). Political orientation is controlled because of its potential association with both pornography consumption and gender-role attitudes (Dolan 2010; Wright 2013a). Religiosity is controlled because of its possible association with both gendered attitudes and pornography exposure (Cotter et al. 2011; Wright 2013b). Age is controlled because of its association with pornography consumption and gender-role attitudes (Dolan 2010; Wright 2013b). Television viewing is controlled because of the gendered nature of some programs and the possibility that people who consume gendered content in one medium also consume it in another medium (Peter and Valkenburg 2007; Ward 1995).

### Research Questions

The preceding discussion of pornography and gender-roles, media socialization, and selective media exposure leads to the following research questions:

RQ1: Controlling for age, education, ethnicity, gender, prior gender-role attitudes, political orientation, religiosity, and television viewing, will pornography consumption at T1 directly predict gender-role attitudes at T2 or interact with age to predict gender-role attitudes at T2?

RQ2: Controlling for age, education, ethnicity, gender, prior pornography consumption, political orientation, religiosity, and television viewing, will

gender-role attitudes at T1 directly predict pornography consumption at T2 or interact with age to predict pornography consumption at T2?

## Methods

### Data Source

Data were produced by the General Social Survey (GSS) (Davis and Smith 2010). Funded by the National Science Foundation, the GSS is the only ongoing, national, personal interview survey examining social beliefs and behaviors currently carried out in the United States. The National Science Foundation provides funds only to programs that rigorously prove human subjects protection. The GSS undergoes institutional review board (IRB) review by the National Opinion Research Center (NORC) at the University of Chicago. Each GSS survey is reviewed before execution. The 2008 GSS was approved on December 5, 2007. The GSS surveys residence-inhabiting adults age 18 or older. All residences in the United States have an equal chance of being selected. Adults within each residence have an equal probability of being interviewed. The characteristics of GSS participants closely resemble the US census and other dependable sources. The first GSS was conducted in 1972. To maximize measurement validity, the GSS began using computer assisted interviewing in 2002.

The GSS has traditionally sampled a different group of respondents at each data collection. Recently, the GSS added a panel component. The present study reports results from the GSS's 2008 (T1)—2010 (T2) panel study. The reinterview rate for the 2008–2010 panel was 80.7 %. Participants who provided pornography and gender-role attitude data at T1 and reinterviewed were compared to participants who provided pornography and gender-role attitude data at T1 and did not reinterview. No differences were found between reinterviewees and nonreinterviewees. Based on attitudinal results from the 2006 GSS panel (Wright 2013a; Wright et al. 2014c) and other longitudinal studies of pornography consumption and attitudes (Peter and Valkenburg 2009, 2010), it was determined that the two year lag from 2008 to 2010 should have been sufficiently long to allow for attitude change.

### Participants

Participants were 425 adults aged 18–89 who provided data at both T1 and T2 on the variables of interest to the present inquiry. Weight variable WTPANNR12 was applied in accordance with GSS directives to adjust for nonresponse (see GSS 2008 Sample Panel Wave 2 2012, for weighting formulae and explication). At T1 participants ranged in age from 18 to 89 and were 44.39 years old on average ( $SD = 15.75$ ). Men comprised 50.3 % of the sample. Whites comprised 80.8 % of the sample, ethnic minorities 19.2 % of the sample (the GSS's "race" variable codes White, Black, and Other—Black and Other were collapsed into a single ethnic

minority category). Participants had completed 13.73 years of education on average ( $SD = 2.65$ ). Participants attended religious services several times a year on average (scale: 0 = never attend religious services, 8 = attend religious services more than once a week;  $M = 3.34$ ,  $SD = 2.69$ ). On a political orientation scale ranging from 1 = extremely liberal to 7 = extremely conservative, participants identified as 'moderate' on average ( $M = 4.12$ ,  $SD = 1.37$ ). Participants reported watching 2.74 h of television a day on average ( $SD = 2.38$ ).

## Measures

The study's primary measures are described below. Measurement stability was established via test-retest reliability (DeVellis 1991). Construct validity was established via convergent associational tests (DeVellis 1991).

### *Pornography Consumption*

Pornography consumption was assessed with the following question: "Have you seen an X-rated movie in the last year?" (no = 0, yes = 1). Pornographic movies can be streamed online from many websites (e.g., [adultvideonetwork.com](http://adultvideonetwork.com), [moviemonster.com](http://moviemonster.com), [adultrental.com](http://adultrental.com)). Adult industry data indicate that pornographic movies remain popular in the United States (Bridges et al. 2010). Recent studies have found that items assessing pornographic movie consumption form internally consistent scales with assessments of consumption of other pornographic media, including internet pornography (Lo and Wei 2005; Peter and Valkenburg 2010; Wright 2013a). Classification of participants into consumer/nonconsumer categories has proven predictive of attitudes and behaviors in a variety of studies (Kjellgren et al. 2010; Wingood et al. 2001; Ybarra et al. 2011; Williams et al. 2009). This particular assessment of pornography consumption has been employed as a central measure in studies published in communication (Wright and Randall 2014), psychology (Wright and Funk 2013), and sexology journals (Buzzell 2005; Wright et al. 2013).

At both T1 and T2, 28.5 % of participants indicated they had viewed a pornographic movie in the prior year. Supporting the reliability of this measure, pornography consumption at T1 was strongly correlated with pornography consumption at T2 ( $r = .56$ ,  $p < .01$ ). Regarding validity, prior studies suggest that the more religious (Wright 2013b) and women (Paul 2009) are less likely to consume pornography. Correspondingly, at baseline the more religious ( $r = -.17$ ,  $p < .01$ ) and women ( $r = -.24$ ,  $p < .01$ ) were less likely to consume pornography.

### *Gender-Role Attitudes*

The following four items (all organized around a disagree-agree continuum) were summed to form a gender-role attitudes scale: "It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family." "Most men are better suited emotionally for politics than are most women." "A working mother can establish just as warm and secure a relationship with her children as a mother who does not work" (reverse coded). "A preschool child is likely

to suffer if his or her mother works.” Items were coded so that higher scores on the scale indicated more gendered attitudes toward women (scale range 3–13; T1  $M = 6.75$ ,  $SD = 2.12$ ; T2  $M = 6.53$ ,  $SD = 1.95$ ). These items have been summed to form a scale in prior gender-role attitude research (Cotter et al. 2011) and are used frequently in gender-role attitude studies (Ciabattari 2001; Fortin 2005; Mason and Lu 1988). Maximum likelihood factor analyses showed that the four items were grouped in a single factor at T1 and T2 (T1 variance explained = 53.58, eigenvalue = 2.14; T2 variance explained = 47.90, eigenvalue = 1.92). Standardized item alphas (T1 = .70, T2 = .60) were comparable to alphas found for gender-role attitude scales used in prior pornography research, such as Burt’s often employed acceptance of violence against women scale (Burt 1980, alpha = .58).

Regarding reliability, gender-role attitudes at T1 were strongly correlated with gender-role attitudes at T2 ( $r = .65$ ,  $p < .01$ ). Regarding validity, prior studies suggest that women should express less gendered attitudes and that older individuals should express more gendered attitudes (Dolan 2010; Mason and Lu 1988). Correspondingly, at baseline women expressed less gendered attitudes ( $r = -.25$ ,  $p < .01$ ) and older adults expressed more gendered attitudes ( $r = .16$ ,  $p < .01$ ).

## Results

A two-step hierarchical multiple regression analysis was utilized to answer the study’s first research question. A two-step hierarchical logistic regression analysis was utilized to answer the study’s second research question. Predictors were entered in the first step. Interactions were entered in the second step. To facilitate coefficient interpretation and to reduce multicollinearity, interval variables were centered and dichotomous variables’ low value = 0. Significant interactions were decomposed according to the procedures outlined by Aiken and West (1991).

A sample size of 425 should be sufficient to detect even small main and interaction effects (Aiken and West 1991; Cohen 1988; Medical Research Council 2014). G\*Power (Faul et al. 2009) a priori analyses for random factors multiple regression and multiple logistic regression assuming a small squared correlation (multiple regression) and a small population odds ratio (logistic regression), power of .80, and an  $\alpha$  error probability of .05 indicated that 400+ participants should be sufficient to detect main effects (see G\*Power 3.1 Manual 2014, for illustrations). Table 8.2 in Aiken and West (1991, p. 159) indicated that a sample size of 400 + should be sufficient to detect a small interaction effect (assuming only a modest contribution of lower-order terms to the variance explained in the model, which was the case in the present data).

### RQ1: Sexual Socialization

Pornography consumption at T1 did not directly predict gender-role attitudes at T2. Controlling for T1 gender-role attitudes, age, education, ethnicity, gender, political orientation, religiosity, and television viewing, the direct association between T1 pornography consumption and T2 gender-role attitudes was not significant (see

**Table 1** Hierarchical multiple regression analysis predicting T2 gender-role attitudes

	$R^2$ change	$F$ change	B	$\beta$	SE
Step 1	.44	36.75**			
T1 age <sup>a</sup>			0.01	0.04	0.01
T1 education <sup>b</sup>			-0.07*	-0.09	0.03
T1 ethnicity <sup>c</sup>			-0.16	-0.03	0.20
T1 gender <sup>d</sup>			-0.14	-0.04	0.15
T1 gender-role attitudes <sup>e</sup>			0.56**	0.61	0.04
T1 political orientation <sup>f</sup>			0.10	0.07	0.06
T1 pornography <sup>g</sup>			0.20	0.05	0.17
T1 religiosity <sup>h</sup>			0.01	0.01	0.03
T1 TV viewing <sup>i</sup>			0.00	0.00	0.03
Step 2	.01	9.51**			
T1 age $\times$ T1 pornography			0.04**	0.14	0.01

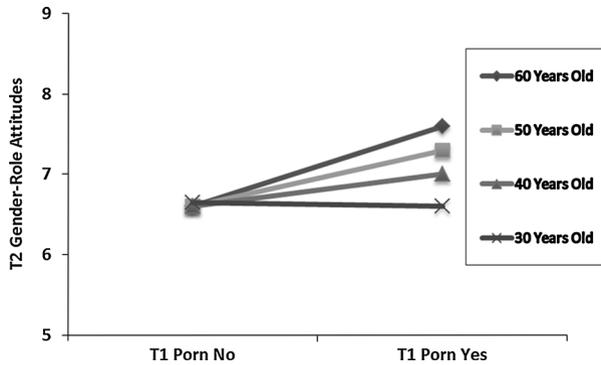
<sup>a</sup> Higher scores = older. <sup>b</sup> Higher scores = more education. <sup>c</sup> White = 0, Nonwhite = 1. <sup>d</sup> Male = 0, Female = 1. <sup>e</sup> Higher scores = more gendered attitudes. <sup>f</sup> Higher scores = more conservative. <sup>g</sup> No pornography exposure = 0, Pornography exposure = 1. <sup>h</sup> Higher scores = more frequent attendance at religious services. <sup>i</sup> Higher scores = more TV viewing

\*  $p < .05$ ; \*\*  $p < .01$

Table 1). However, consistent with Peter and Valkenburg (2011a), the interaction between T1 pornography consumption and T1 age on T2 gender-role attitudes was significant (see Table 1).

To determine the nature of a significant interaction, Aiken and West (1991) suggest carrying out simple-slope tests for moderator values one standard-deviation above and below the mean of the moderator. Given that the mean age of the sample  $\approx 45$  ( $SD \approx 15$ ), simple-slope tests were carried out beginning at age 30 and ending at age 60 in 5 year increments to explore the nature of the interaction. Pornography consumption did not predict the gender-role attitudes of 30 ( $\beta = -0.03$ ,  $p = .50$ ), 35 ( $\beta = 0.01$ ,  $p = .83$ ), or 40 ( $\beta = 0.05$ ,  $p = .21$ ) year olds. In contrast, pornography consumption predicted the gender-role attitudes of 45 ( $\beta = 0.09$ ,  $p < .05$ ), 50 ( $\beta = 0.13$ ,  $p < .01$ ), 55 ( $\beta = 0.17$ ,  $p < .01$ ), and 60 ( $\beta = 0.21$ ,  $p < .01$ ) year olds, the magnitude of the relationship increasing with age. Because earlier gender-role attitudes were included in the analysis, these coefficients indicate that pornography consumption was associated with over time interindividual increases in older adults' gendered attitudes (Little et al. 2009). Figure 1 presents a visual accompaniment of the interaction.<sup>2</sup>

<sup>2</sup> As indicated in the literature review, pornography consumption has been correlated with gendered attitudes among both males and females (Brown and L'Engle 2009; Zillmann and Bryant 1982, 1988). Consequently, a pornography consumption  $\times$  gender interaction on gender-role attitudes was not predicted. Analyses were run investigating this possibility, however. Whether a pornography consumption  $\times$  gender interaction term was included before entering the pornography consumption  $\times$  age interaction term (i.e., pornography consumption  $\times$  gender interaction term entered in step 2, pornography consumption  $\times$  age interaction term entered in step 3) or after entering the pornography



**Fig. 1** Interaction of T1 pornography consumption and T1 age on T2 gender-role attitudes

## RQ2: Selective Exposure

Gender-role attitudes at T1 did not directly predict pornography consumption at T2. Controlling for T1 pornography consumption, age, education, ethnicity, gender, political orientation, religiosity, and television viewing, the direct association between T1 gender-role attitudes and T2 pornography consumption was not significant (see Table 2). The interaction between T1 gender-role attitudes and T1 age on T2 pornography consumption was also nonsignificant (see Table 2).<sup>3</sup>

## Discussion

The present two-wave longitudinal study investigated associations between US adults' consumption of pornography and gendered attitudes toward women. Pornography consumption at time one did not directly predict gender-role attitudes at time two. Instead, prior pornography consumption interacted with age to predict subsequent gender-role attitudes. Pornography consumption did not prospectively predict the gender-role attitudes of younger adults. However, pornography consumption did predict interindividual over time change in gendered attitudes toward women among adults aged 45 and older, even after a variety of potential

Footnote 2 continued

consumption  $\times$  age interaction term (pornography consumption  $\times$  age interaction term entered in step 2, pornography consumption  $\times$  gender interaction term entered in step 3), the pornography consumption  $\times$  gender interaction term was not significant. Thus, gender did not interact with pornography consumption to predict attitudes.

<sup>3</sup> The possibility that gender-role attitudes interacted with gender to predict pornography consumption was also explored. Whether the gender-role attitude  $\times$  gender interaction term was included before entering the gender-role attitude  $\times$  age interaction term (i.e., gender-role attitude  $\times$  gender interaction term entered in step 2, gender-role attitude  $\times$  age interaction term entered in step 3) or after entering the gender-role attitude  $\times$  age interaction term (gender-role attitude  $\times$  age interaction term entered in step 2, gender-role attitude  $\times$  gender interaction term entered in step 3), the gender-role attitude  $\times$  gender interaction term was not significant. Thus, gender did not interact with attitudes to predict pornography consumption.

**Table 2** Hierarchical logistic regression analysis predicting T2 pornography consumption

	Nagelkerke $R^2$ change	$\chi^2$ change	Odds ratio	95 % CI odds ratio
Step 1	.42	145.14**		
T1 age <sup>a</sup>			0.98	0.97–1.00
T1 education <sup>b</sup>			0.90	0.81–1.02
T1 ethnicity <sup>c</sup>			1.02	0.53–1.99
T1 gender <sup>d</sup>			0.51*	0.29–0.90
T1 gender-role attitudes <sup>e</sup>			0.87	0.76–1.00
T1 political orientation <sup>f</sup>			1.06	0.85–1.31
T1 pornography <sup>g</sup>			11.95*	6.87–20.79
T1 religiosity <sup>h</sup>			0.97	0.87–1.08
T1 TV viewing <sup>i</sup>			0.99	0.88–1.12
Step 2	.00	0.00		
T1 age $\times$ T1 gender-role attitudes			1.00	0.99–1.01

<sup>a</sup> Higher scores = older. <sup>b</sup> Higher scores = more education. <sup>c</sup> White = 0, Nonwhite = 1. <sup>d</sup> Male = 0, Female = 1. <sup>e</sup> Higher scores = more gendered attitudes. <sup>f</sup> Higher scores = more conservative. <sup>g</sup> No pornography exposure = 0, Pornography exposure = 1. <sup>h</sup> Higher scores = more frequent attendance at religious services. <sup>i</sup> Higher scores = more TV viewing

\*  $p < .05$ ; \*\*  $p < .01$

confounds were considered, including whether participants were more or less educated, of minority status, male or female, conservative or liberal, and more or less religious.

The hypothesis of reverse-causality was explored but not supported. Prior gender-role attitudes did not predict interindividual over time change in pornography consumption for adults of any age.

Therefore, although it remains a possibility that gender-role attitudes untapped by this study's items facilitate US adults' consumption of pornography, the present findings support a sexual socialization more so than a selective exposure perspective on pornography. In other words, the present study's results provide more support for the perspective that correlations between pornography consumption and content-congruent attitudes are due to certain consumers using information in pornography to guide their attitudes than due to individuals who already possess particular attitudes gravitating to pornographic content supportive of these attitudes. The majority of longitudinal studies of pornography consumption and content-related attitudes and behavior have generated a similar pattern of findings (e.g., Peter and Valkenburg 2008, 2010, 2011a, b; Wright 2012b; Wright and Randall 2014; Wright 2014).

For instance, Wright (2012b) studied casual sex behavior and pornography consumption and predicted a selective exposure effect. Specifically, Wright predicted that prior casual sex behavior would predict subsequent pornography consumption. Instead, prior pornography consumption predicted subsequent casual sex behavior. Turning to the pornography use literature for insight, Wright observed that attitudinal confirmation or avoidance of attitudinal threat (i.e., selective

exposure dynamics) were not mentioned as reasons for pornography use. Instead, motives such as masturbatory stimulation, boredom relief, stress reduction, loneliness alleviation, fantasy, and curiosity appear to drive consumption. Thus, individuals may consume pornography for reasons unrelated to their preexisting beliefs, but an incidental effect of exposure for some consumers may be a shift in attitudes.

The results also speak to the sometimes stated, sometimes implied assumption in the media sex literature that older consumers are less likely to be influenced by sexual media scripts than younger consumers (Peter and Valkenburg 2011b). Peter and Valkenburg (2011b) found that pornography consumption prospectively predicted lack of condom use among adult males but not adolescent males in their predominately heterosexual sample (condoms are rarely used in pornographic encounters featuring men and women—Bridges et al. 2010; Grudzen et al. 2009). The authors cited literature supporting the idea that adults are more naïve to sexually transmitted infection (STI) risk than adolescents. Peter and Valkenburg (2011a) found in the same sample that pornography consumption prospectively predicted adults'—but not adolescents'—belief in women's stereotypical sexual roles. The authors surmised that sexually experienced adults have encountered more sex-typed women than sexually inexperienced adolescents. The present study found the strongest associations between prior pornography consumption and subsequent gender-role attitudes among older individuals, who are already more sympathetic to gendered beliefs about women. The common conceptual thread uniting these studies is that older consumers were probably less likely to possess scripts incongruent with the particular attitude or behavior examined than younger consumers. That media sexual socialization is more likely when consumers lack conflicting scripts is a central tenet of the  $\text{3AM}$  (Wright 2011, 2013a, c; Wright et al. 2013). In sum, the moderating effect of age may depend on whether age is associated with the attitude or behavior in question.

Last, the results support the theoretical premise that the consumption of pornography may result in higher-order scripting effects, in addition to specific scripting effects (Bandura 2001; Huesmann 1986; Wright 2011). Specific scripting is evidenced when consumers' attitudes map directly onto pornographic depictions. For instance, if pornography consumers have more positive attitudes toward males ejaculating onto females' faces specific scripting is evidenced, since facial ejaculation is common in pornography (Bridges et al. 2010; Gorman et al. 2010). Higher-order scripting is evidenced when consumers' attitudes are congruent with the overarching perspective on sociality demonstrated in the depiction. According to anti-pornography feminists, the overarching perspective on gender in most pornography is that women are “a sex diminished, immature, and unequal to men in subtle as well as obvious ways” (Cowan et al. 1988, p. 309; see also Dines 2010 and Jensen 2007). If consumers have incorporated this abstract script, they should perceive more truth (as they do in the present study) with statements such as “Most men are better suited emotionally for politics than are most women” and “It is much better for everyone involved if the man is the achiever outside the home and the woman takes care of the home and family.” In sum, the results support the premise that fundamental evaluations of women and women's roles can be affected by viewing pornography (Jansma et al. 1997).

## Limitations and Future Directions

Limitations of the present study point to several future research directions. First, the results should not be interpreted as proof that the gender-role attitudes of younger persons are unaffected by pornography consumption. Longitudinal survey research with adolescents (Brown and L'Engle 2009) and experimental research with young adults (Zillmann and Bryant 1982, 1988) suggests that the gender-role attitudes of youth can be affected by pornography exposure. Discrepant results may be due to differences in gender-role attitude assessment across studies. While the attitude items in the present paper have been used in previous research (Ciabattari 2001; Cotter et al. 2011; Fortin 2005; Mason and Lu 1988), no prior pornography study has used these specific items. Additionally, although there remains significant variability in these attitudes in contemporary America, the items were developed by the GSS in the 1970s and may not capture the ways in which gendered social perspectives manifest in the lives of young people today (Glick and Fiske 2011). Discrepant results may also be due to sample differences across studies. For example, the present study employed a national sample while Brown and L'Engle and Zillmann and Bryant sampled from the South and Midwest, regions known for more traditional attitudes (Newport 2013).

Second, the results should not be interpreted as proof that the gender-role attitudes of older persons are affected by pornography consumption. The internal validity of panel surveys that assess reverse causation (i.e., selective exposure, in the case of media effects research), include autoregressive components (i.e., lagged dependent variable control), and control for multiple potential confounds have high internal validity (Little et al. 2009). However, the most conclusive evidence of cause is provided by the experimental design.

In sum, additional research is needed. Studies employing diversity in participant age, participant locale, and attitudinal measurement are desirable. Interval-level assessment of pornography consumption may also be advantageous. Although the impact on regression coefficients due to restrictions of range is minimal when relationships between variables are linear, attenuation of correlation coefficients may occur (Cohen and Cohen 1983). Primary data analysts should use interval-level measures of pornography consumption to increase the amount of variability in attitudes explained by pornography consumption. Stronger associations should also emerge if specific genres of pornography are assessed. While it is clear that gender stereotypic depictions are common in the most popular pornography (e.g., 'gonzo' pornography—Bridges et al. 2010; Dines 2010; Jensen 2007; Sun et al. 2008), pornographic depictions that are gender-egalitarian (e.g., 'idealized' pornography—Gunter 2002) or that reverse gender-roles (e.g., 'MILF' pornography—Vannier et al. 2014) are also available. That general assessments of pornography consumption have been predictive of gendered attitudes in this and other studies suggests the gendered nature of the most commonly consumed content. However, as general assessments likely capture some exposure to egalitarian or gender-role reversed content, stronger associations should be found using genre-specific measures.

Design diversity is also needed. Survey studies are more ecologically valid than experiments, as surveys assess naturally occurring—as opposed to laboratory

induced—pornography consumption (Garcia 1986). External validity is also easier to achieve in survey studies. Financial and logistical obstacles to large-scale probability sampling are more pronounced for laboratory studies than survey studies, especially with the advent of internet surveying techniques. Internal validity is higher in experimental studies, however. The most confident knowledge about the nature and extent of pornography's influence on gender-role attitudes will arise from a combination of survey and experimental studies (Hald et al. 2010; Wright 2011). Finally, in addition to testing the conditions under which pornography consumption and gender-role attitudes are correlated (i.e., tests of moderation), future studies should test the underlying mechanisms connecting pornography consumption and gender-role attitudes (i.e., tests of mediation). Peter and Valkenburg's (2009) longitudinal research on pornography consumption and notions of women as sex-objects suggests the mediating role of sexual arousal. Their findings suggest that pornography consumers may adjust their attitudes to align with gendered content they find arousing and be most aroused by content that aligns with their preexisting gendered attitudes.

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