

ORIGINAL ARTICLE

Pornography and Sexist Attitudes Among HeterosexualsGert Martin Hald^{1,2}, Neil N. Malamuth³, & Theis Lange⁴

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Using a probability-based sample of young Danish adults and a randomized experimental design, this study investigated effects of past pornography consumption, experimental exposure to nonviolent pornography, perceived realism of pornography, and personality (i.e., agreeableness) on sexist attitudes (i.e., attitudes toward women, hostile and benevolent sexism). Further, sexual arousal mediation was assessed. Results showed that, among men, an increased past pornography consumption was significantly associated with less egalitarian attitudes toward women and more hostile sexism. Further, lower agreeableness was found to significantly predict higher sexist attitudes. Significant effects of experimental exposure to pornography were found for hostile sexism among low in agreeableness participants and for benevolent sexism among women. These experimental exposure effects were found to be mediated by sexual arousal.

doi:10.1111/jcom.12037

In the controversy about effects of pornography, attitudes have long held a central role, with concerns about exposure to such materials increasing sexist and related attitudes. Given consistent cross-cultural findings of high prevalence rates of pornography consumption among the general population (Hald, Seaman & Linz, 2012), investigating the extent to which pornography consumption may adversely affect sexist attitudes is highly important in order to qualify the debate on effects of pornography and efforts being made to effectively reduce such or related attitudes. This study was specifically designed to investigate effects of exposure to pornography on sexism as it is present in current society (see also Glick & Fiske, 1996) and elucidate some of the mechanisms by which pornography may influence some individuals, thereby rectifying important shortcomings of available research in the area.

In this introduction, we begin by presenting a definition of sexism and reviewing core relevant research on effects of pornography on sexist attitudes (for a more

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extensive integrative summary see also Hald *et al.*, 2013). We then explicate the general theoretical framework of the study, study moderators, and mediator, and provide a rationale for our choice of exposure materials, study sample, and outcome measures of sexist attitudes.

Defining sexism

Traditionally, sexism has been conceptualized as a reflection of some form of negative attitudes toward women (or men), including hostility, negative prejudices, and stereotypes (Allport, 1954; Glick & Fiske, 1996). However, more recently, extensive cross-cultural research has shown that sexism may also include a benevolent side (Glick *et al.*, 2000), described by Glick & Fiske (1996, p. 491) as “a set of interrelated attitudes toward women that are sexist in terms of viewing women stereotypically and in restricted roles but participatively positive in feeling tone (for the perceiver) and also tend to elicit behaviors typically categorized as pro-social (e.g. helping) or intimacy seeking (e.g. self-disclosure).” Thus, the underpinnings of benevolent sexism are gender stereotypes and masculine dominance, even if the attitudes and behaviors associated with benevolent sexism present a positive, considered, and helpful orientation (e.g., the man as the provider and protector and the female as his dependent) (Glick & Fiske, 2001). Accordingly, in this article, sexism refers both to the more traditional understanding of the term as well as to “benevolent sexism” as outlined above.

Sexist attitudes have been associated with a range of adverse effects, including discrimination against women, gender rigidity, hostility, and anger toward women (Carr & VanDeusen, 2004; Chapleau, Oswald, & Russell, 2007), the belief that women engage in token resistance to sex (i.e., say “no” when actually intending to have sex) (Edwards, Turchik, Dardis, Reynolds, & Gidycz, 2011), greater self-reported likelihood of using violence in relationships with women (Demare, Lips, & Briere, 1993), acceptance of rape myths (Chapleau *et al.*, 2007), and the commission of real-life sexual aggression including rape (Brown & L’Engle, 2009; Check & Malamuth, 1983; Kjellgren, Priebe, Svedin, & Langstrom, 2010). Thus, investigations into the etiology of sexual attitudes remain highly important.

Previous research on pornography and sexist attitudes

Cross-culturally, research shows that pornography is easily accessible and widely used, particularly by youth and young adults (see also Hald, Kuyper, Adam, & De Wit, 2013; Luder *et al.*, 2011; Peter & Valkenburg, 2006; Wright, 2011). Research on the association between pornography exposure and sexist attitudes is somewhat more equivocal. On the one hand, a number of previous survey and experimental studies fail to demonstrate significant associations between pornography and sexism or find only weak positive or even negative associations (Carr & VanDeusen, 2004; Demare *et al.*, 1993; Fisher & Grenier, 1994; McKee, 2007; Padgett, Brislin-Slütz & Neal, 1989). On the other hand, more recent research including both prospective and longitudinal studies with diverse samples indicates that exposure to sexually explicit Internet media increases “notions of women as sex objects” (Peter & Valkenburg, 2009), the belief that

women engage in token resistance to sex (Edwards *et al.*, 2011) is associated with significantly stronger gender stereotypic attitudes and cognitions (Kjellgren *et al.*, 2010), and early exposure to sexually explicit media is predictive of less progressive gender role attitudes, and, for males only, greater sexual harassment perpetration 2 years later (Brown & L'Engle, 2009). However, these studies do not fully allow for causal conclusions. For example, as pointed out recently by Guy, Patton, and Kaldor (2012), it may be that individuals predisposed to earlier and more sexual engagement may also be the ones to increasingly seek out sexual content. This underscores the need for empirical studies both more directly enabling the assessment of causality and targeting dispositional factors that might affect the exposure-attitudinal relationship studied.

Two major shortcomings relate to the majority of previous work in the area. First, most studies included measures of sexism that do not adequately represent sexism as it is manifested in current society and conceptualized in more recent theory (see also Glick & Fiske, 1996). Second, most studies, by virtue of design and/or included variables, do not have the ability to investigate relevant mediating mechanisms and moderating effects of the pornography-sexist attitudinal relationship investigated and thereby elucidate some of the mechanisms by which pornography may influence certain individuals. This study was designed in part to rectify these two shortcomings.

General theoretical framework

The general theoretical framework that guides this study is based on social learning theory (Bandura, 1986) and sexual script theory (Simon & Gagnon, 1986). Based on social learning theory, pornography may be thought to influence attitudes and behaviors by creating role models, learning environments, and scenarios in which certain sexual behaviors, gender stereotypes, sex roles, and attitudes are normalized, encouraged, and reinforced (Hald *et al.*, 2012). Importantly, social learning theory proposes a range of moderating and mediating mechanisms between the stimulus (herein pornography) and the response (herein sexist attitudes) (see also Bandura, 1986).

Sexual script theory has only recently emerged as a theoretical perspective to guide research and analyses of quantitative data pertaining to pornography. Sexual script theory, as proposed by Gagnon and Simon (1973), has been conceptualized as an organizing framework of sexuality relying on social constructionism and the principles of social learning theory. According to Frith and Kitzinger (2001), sexual scripts may be understood as “culturally available messages that define what ‘counts’ as sex, how to recognize sexual situations, and what to do in a sexual encounter” (p. 210). Simon and Gagnon (1986) compare sexual scripts to scripts used by actors. In sexual interactions, sexual scripts may serve as a guide and a manual for sexual behaviors.

Repeated exposure to pornography may influence the scripting process, the sexual scripts, or the evaluation of sexual relations (Hald *et al.*, 2012). The explicit imagery, underlying messages, symbolic normative nature, and order of sexual behaviors as portrayed in pornography may influence the affective, cognitive, and behavioral aspects of sexuality, especially if these are not yet well rooted (Stulhofer, Busko, & Landripet, 2010). As such, pornography through culturally mediated messages

and social learning processes may “write” itself into the sexual scripts influencing perceptions of sexuality (e.g., what is sex), sexual situations (e.g., when is a situation sexual), sexual behaviors (e.g., what to do when having sex), and evaluations of sexual relations (e.g., what constitutes good sex). Such theorizing was the basis for our first hypothesis that past pornography consumption will significantly predict sexist attitudes (H1).

Studying moderators and mediators

In a number of reviews (e.g., Kingston, Malamuth, Fedoroff, & Marshall, 2009) and research papers (e.g., Peter & Valkenburg, 2009, 2010) investigators have emphasized the importance of considering individual differences as moderators and mediators of the relationship between pornography and attitudes. Consequently, a goal of this research was to study the potentially moderating effects of personality (agreeableness) and perceived realism of pornography and the mediating effect of sexual arousal on the relationship between experimental exposure to pornography and sexist attitudes.

Individual differences moderation

Previous studies that have included individual differences in personality as moderators of the relationship between pornography and dependent variables have used a wide variety of personality or related measures (Williams, Cooper, Howell, Yuille, & Paulhus, 2009). These have generally been used to assess aspects of antisocial tendencies by measuring various “lower-order” personality or related characteristics (e.g., Williams *et al.*, 2009). Thus, a major shortcoming in previous research has been the omission of including “higher-order” relevant personality dimensions that may encompass these previously identified lower order personality characteristics under one heading (Funder, 2007). In this study, we used the well validated five-factor model (FFM) of personality (Funder, 2007; Costa & McCrae, 1992), and selected the dimension of agreeableness to investigate moderating mechanisms of personality in the relationship between experimental exposure to pornography and sexist attitudes. Individuals relatively high in agreeableness tend to be compassionate, cooperative, value social harmony, and believe that people are basically honest, decent, and trustworthy. In contrast, individuals low in agreeableness tend to be antagonistic, cold, hostile, suspicious, disagreeable, unfriendly, and place self-interest above getting along with others.

The dimension of agreeableness was chosen because it entails the personality traits most clearly relevant to an exploitative approach to sexuality, conflict in relationships, and sexist or related attitudes (Malamuth, 2003; Voller, Long, & Aosved, 2009). Moreover, previous research, as summarized by Jonason, Li, Webster, & Schmitt (2009), shows that agreeableness is well correlated with characteristics that have been frequently included as part of the lower order correlates of sexual aggression, for example, psychopathy and narcissism. Further, low agreeableness has been shown to be predictive of men’s perception of women’s sexual exploitability (Lewis, Easton, Goetz, & Buss, 2012). Based on these previous study findings, we

hypothesize that: Agreeableness will significantly predict sexist attitudes with lower in agreeableness participants holding higher levels of sexist attitudes (H2). Further, that the interaction between experimental exposure to pornography and agreeableness will significantly predict sexist attitudes over and above agreeableness, past pornography consumption, perceived realism of pornography, and exposure condition. Only individuals low in agreeableness will evidence increased sexist attitudes as a function of exposure to pornography (H3).

Perceived realism, that is, the extent to which the consumer perceives the pornographic content as realistic (see also Peter & Valkenburg, 2010; Stulhofer, Busko, & Schmidt, 2012), has been found to be significantly positively correlated with pornography consumption (Hald, 2007), a mediator of the impact of internet pornography consumption on adolescents' instrumental attitudes toward sex (Peter & Valkenburg, 2010), and a predictor of relationship intimacy (Stulhofer et al., 2012). Based on this research we expect that perceived realism of pornography might predict sexist attitudes and/or moderate experimental effects of exposure to pornography on sexist attitudes. However, due to research on perceived realism being very sparse we refrain from making *a priori* hypotheses related to this variable and remain explorative in our research approach concerning this variable.

Sexual arousal mediation

While social learning theory and sexual script theory may be used to hypothesize repeated exposure effects of pornography, the idea that a one-time experimental exposure to pornography may activate certain kinds of attitudes is consistent with the media literature on affective engagement (Clore & Schnall, 2005; Ward, 2002) and priming effects (Hansen & Krygowski, 1994; Roskos-Ewoldson et al., 2009). In this literature, affective activation as a mediator of cognitive and attitudinal impacts of stimuli, for example, pornography, is considered central. This is especially relevant for pornography, because pornography is designed primarily to activate the affect of sexual arousal and associated pleasurable responses; elements considered essential for affective engagement and mediation.

While the initial primary effect of pornography exposure may be affective in the form of sexual arousal, based on the Hierarchical Confluence Model of Sexual Aggression (HCM) (Malamuth, 2003) it is hypothesized that such affective engagement may activate or prime an "associative network" of sexist and related attitudes. Thus, the Confluence Model contends that for a small subgroup of users, scoring high on known risk factors of sexual aggression, pornography consumption may add "fuel to the fire" and increase the risk of sexually aggressive attitudes and behaviors by activation or priming of an "associative network" of emotions, cognitions, and attitudes related to sexual aggression (Malamuth, Hald, & Koss, 2012). Although sexist attitudes and sexual aggression are not the same, we suggest that the underlying rationale of the Confluence Model may also apply here so that sexual arousal will mediate experimental effects of exposure to pornography on sexual attitudes at least among the subgroup of users who possess relevant

associative networks. Thus, we hypothesize that sexual arousal will mediate significant associations, if any, between experimental exposure to pornography and sexist attitudes (H4).

Background on exposure material, study sample, and outcome measures

In this research we chose to make use of nonviolent pornography as opposed to other types of pornography, for example, violent pornography, primarily for three reasons. First, because nonviolent pornography is the type of pornography most frequently produced and consumed (Hald et al., 2012). Second, because nonviolent pornography may be the most suitable, while still representative, type of pornography available for testing the “activation” or priming model without confounding the outcomes assessed by our measures of sexist attitudes. In other words, using highly sexist, hostile, degrading, violent pornography might have made it more difficult to assess if effects of exposure on attitudes were due to a priming of sexist-related attitudes held prior to the experiment or “residuals” of prosexist messages and attitudes violent in nature directly presented in the exposure material. Third, because the few prior investigations conducted involving pornography and sexual arousal used violent pornography only (e.g., Davis, Norris, George, Martell, & Heiman, 2006). Thus, investigations involving nonviolent pornography, sexual arousal, and sexist attitudes or related measures are missing in this area of research. This is problematic because meta-analyses show that attitudes related to the attitudes studied here correlate significantly higher with use of sexually violent pornography than with nonviolent pornography (see also Hald, Malamuth, & Yuen, 2010). Accordingly, results from studies using violent pornography may not generalize to studies involving nonviolent pornography.

Although much of the previous work on pornography and sexist attitudes has predominantly used male samples, we find it important to also include female samples. First, cross-culturally studies of pornography consumption rates show that a sizable proportion of women use pornography, that is, 30–86% (Hald et al., 2012). Second, recent research suggests that greater sexist and related attitudinal adherence may be especially problematic for women in areas related to sexuality, gender equality, and gender roles (Edwards et al., 2011; Sanchez, Fetterolf, & Rudman, 2012).

To encompass both older and newer conceptualizations of sexism (see above), two measures of sexist attitudes were chosen as dependent measures: an older, more traditional measure, the Attitudes Toward Women Scale (Spence & Helmreich, 1972; Spence, Helmreich, & Stapp, 1973), and a newer, more contemporary measure, the Ambivalent Sexist Inventory (Glick & Fiske, 1996).

Method

Participants

A stratified sample of young adults ages 18–30 years was randomly selected among all young adults living in the city of Aarhus ($n = 291,720$), the second largest city in

Denmark. The sample was stratified according to gender (equal male/female ratio), age (18–30 years; equal age distribution), place of birth (Denmark), and citizenship (Danish). A total of 200 participants, 100 men and 100 women, were included in the final sample. The mean age of male participants was 24.64 years ($SD = 3.76$). The mean age of female participants was 24.39 ($SD = 3.72$) ($p > .05$; independent sample t -test).

Sociodemographic characteristics of the 200 participants were checked against the general population of young adults aged 18–30 living in Aarhus and in Denmark, respectively, using Statistics Denmark. Participants included in the final sample were found to be representative of young Danish adults, locally as well as nationally.

Procedure

A total of 350 randomly selected young adults were contacted once by ordinary mail and invited to participate in an experiment related to sexuality and media effects against compensation of DKK 250 (approx. US \$40) or three bottles of wine. Seventeen letters were returned to sender, address unknown. Among the remaining 333 participants (166 females; 167 males), a total of 229 returned a form of consent (112 females; 117 males). Thus, the response rate was 67.9% for women and 70.1% for men (Pearson's χ^2 -test = .26; $p > .05$).

All potential participants were contacted by phone, and an appointment for participation in the experiment was made. Exclusion criteria included bi- or homosexuality, mental retardation, very poor sight, severe hearing problems, an inhibitory sexual problem, conviction of a sexual crime, reporting of a sexual crime, a diagnosis of mental illness, currently undergoing psychological or psychiatric treatment, or currently under the legal care of a guardian. The exclusion criteria were chosen because they complied with the ethical guidelines set forth by The Scientific Ethical Committee of the County of Aarhus and because upon conclusion of the current experiment, control group participants were invited to enter into a different experiment examining sexual arousal to heterosexual pornography. Nine women and 11 men were excluded on this basis. For logistical reasons, only the first 100 eligible respondents of each gender were offered a place in the experiment.

Following inclusion in the experiment, participants were sent a letter containing practical information, a brief nonspecific description of the experiment, and background measures questionnaires which they completed prior to coming to the experimental setting. Upon arrival, participants were (a) randomly assigned to either a control group or an experimental group, (b) asked to sign a form of consent, (c) paid compensation, (d) given standard information on how to operate the equipment and complete the outcome questionnaires, (e) exposed to approx. 30 minutes of pornographic video stimuli (experimental group) or emotionally neutral video stimuli (control group), (f) given time to fill out the outcome measures, and (g) debriefed. Participants were alone during the exposure and response phases, and their answers guaranteed anonymity.

Measures & materials

Background measures

Danish personality item pool questionnaire (D-IPIP-Q). Agreeableness was measured using relevant items from the original short version of the International Personality Item Pool Scale (IPIP), the D-IPIP-Q. The validity and reliability of the IPIP scales have been documented in numerous cross-cultural and international published studies including studies using a Danish subject sample (Goldberg et al., 2006).

Pornography consumption questionnaire (PCQ). The PCQ is a 139-item questionnaire measuring patterns of pornography consumption and associated factors (see also Hald, 2006). In this study five items from the PCQ were used to measure past pornography consumption (four items) and perceived realism of pornography (one item), that is, the extent to which the consumer perceives the pornographic content as realistic (see also Hald, 2006; Hald & Malamuth, 2008; Peter & Valkenburg, 2010; Stulhofer, Busko, & Schmidt, 2012). Following Hald (2006), four highly correlated variables measuring past pornography consumption, that is, average time of use per week, frequency of use, pornography consumption when having sexual activity on one's own, and exposure patterns of pornography within the last 12 months, were combined, using factor analysis, into a single "past pornography consumption" measure, yielding a better overall estimate of pornography consumption.

Main outcome measures

Ambivalent sexism inventory (ASI). The ASI was employed to assess "benevolent sexism" (BS, 11 items) and "hostile sexism" (HS, 11 items) (Glick & Fiske, 1996; Glick et al., 2000; Glick & Fiske, 2001). The ASI contains 22 statements regarding men and women and their relationship in modern society. Hostile sexism is described as fitting Allport's (1954) classic definition of prejudice, that is, an antipathy based on a faulty and inflexible generalization of women. Benevolent sexism is described as a set of interrelated attitudes toward women that view women stereotypically and in restricted roles but are positive in feeling and tone and tend to elicit prosocial behaviors (see also Introduction). Response to each statement is given on a six-point Likert scale. For all scales, higher scores indicate more sexist attitudes. Cronbach's α for the ASI total scale was 0.88 and for the BS and HS subscales 0.81 and 0.87, respectively, indicating good internal consistency.

Attitudes Toward Women Scale (ATWS). The Danish version of the ATWS consists of 19 statements reduced from the original 25 statements due to psychometric considerations. The ATWS measures the rights and roles of women in society (Spence & Helmreich, 1972; Spence et al., 1973). Responses are given on a four-point Likert scale. Lower scores indicate more sex-role traditionalism; higher scores denote more sex-role egalitarianism. Cronbach's α for the 19 item ATWS was 0.60, which indicates questionable internal consistency.

Manipulation measure

Sexual arousal scale (SAS—six items). The SAS includes six statements each including an adjective prompt for sexual arousal. The scale is adapted from Mosher, Barton-Henry, and Green (1988). Cronbach's α for the SAS was 0.83, indicating very good internal consistency for a relatively short scale.

Manipulation check scale. Subjects were asked to indicate the degree to which they found the video material pornographic by providing a mark on a 10-cm line. The line was anchored by "not at all pornographic" and "extremely pornographic," respectively.

Exposure materials

Experimental material (experimental group). The experimental material consisted of a videotape made up from 2 minutes of "black screen" followed by a 17-minute sex scene from *Latex* and an 8-minute sex scene from *Gigantic*, two of the most widely circulated and sold hardcore pornographic movies in Denmark at the time of the experiment. In order to minimize order effect, a second video tape was used in which the order of the sex scenes was reversed. The sexual acts portrayed included oral sex, vaginal sex, anal sex, double penetration, and facial cumshots with consenting parties. The story line from *Latex* portrayed a man having sex with his female partner. The story line from *Gigantic* portrayed a female engaging in sex with her husband and a friend of her husband. In both scenes sexual acts are initiated and decided by the male/males, no explicit violence or degradation is used (see also Bridges, Wosnitzer, Scharrer, Sun, & Liberman, 2010), and both genders show signs of sexual pleasure throughout the scenes.

Control material (control group). Excerpts from two emotionally neutral, high-quality documentaries, *The Blue Planet* and *The Elements: Wind & Water*, were used. Following the same procedure as with the experimental material two different—yet in content, structure, and running time identical—videotapes were created.

Results

Background check

In confirming the success of random assignment, it was found that participants in the experimental group did not differ significantly from participants in the control group on key variables, that is, age, education, relationship status, age of first exposure to pornography, past pornography use, and personality (all $p > .05$; independent sample t -test).

Manipulation check, sexual arousal, and sexist attitudes

Participants in the experimental group rated the exposure material as significantly more pornographic ($t(194) = 31.10$, $p < .001$, Cohen's $(d) = 4.47$) and sexually arousing ($t(197) = 19.44$, $p < .001$, Cohen's $(d) = 2.77$) than the control group.

These results were found to hold stable across gender. Table 1 shows the mean and *SD* of the manipulation check, sexual arousal, and sexist attitudes stratified by exposure group and gender.

Test of study hypothesis 1

H1: Past pornography consumption will significantly predict sexist attitudes.

To test the first study hypothesis, zero-order Pearson's correlation analyses stratified by gender was employed. For women, past pornography consumption was found not to be significantly associated with any of the sexist attitudes investigated (all $p > .05$). For men, past pornography consumption was found to be significantly correlated with attitudes toward women ($r = -.21, p < .05$) and hostile sexism ($r = .30, p < .01$), while no significant association was found for benevolent sexism and overall ambivalent sexism (both $p > .05$). Thus, among men higher past pornography consumption was found to be significantly associated with less egalitarian attitudes toward women and higher levels of hostile sexism. These results only partly support study H1.

Test of study hypotheses 2 and 3

H2: Agreeableness will significantly predict sexist attitudes with those lower in agreeableness participants holding higher levels of sexist attitudes.

H3: The interaction between experimental exposure to pornography and agreeableness will significantly predict sexist attitudes over and above agreeableness, past pornography consumption, perceived realism of pornography, and exposure condition. Only individuals low in agreeableness will evidence increased sexist attitudes as a function of exposure to pornography.

To test study H2 and H3, hierarchical multiple regression analyses were employed. Initially, independent variables were centered and interaction terms created by multiplying the centered variables included in the interaction term (see also Aiken & West, 1991). To control for possible effects of gender, as gender consistently has been found to be a strong differentiating variable in this area of pornography (Hald, 2006), gender was firstly entered into the regression analysis. In step 2, 3, and 4 agreeableness, past pornography consumption and perceived realism of pornographic material respectively were entered separately. In step 5, exposure group (control vs. experimental) was entered. In step 6, all two-way interactions were entered. All single variables were entered into the analysis by means of "forced enter." Two-way interactions were entered using "step-wise enter" and an *F* probability criterion of .05 for entry and .10 for removal. Tables 2 and 3 provide an overview of the main findings of the regression analyses.

As can be seen from Table 2 for attitudes toward women, the final model showed that gender and agreeableness significantly predicted attitudes toward women. Specifically, male gender and lower agreeableness were found to significantly predict less egalitarian and more conservative attitudes toward women.

Table 1 Mean Raw Scores and Standard Deviations for Sexist Attitudes, Sexual Arousal, and Pornographic Manipulation Check Stratified by Gender and Exposure Group

Variable	Control Group		Experimental Group	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Attitudes Toward Women Scale				
Men	49.68 (50)	6.54	49.09 (49)	6.72
Women	52.00 (50)	5.38	51.00 (50)	4.75
Total	50.84 (100)	6.07	50.05 (99)	5.86
Ambivalent Sexism Inventory				
Benevolent Sexism				
Men	26.12 (50)	6.81	24.69 (49)	8.46
Women	15.54 (50)	9.36	21.68 (50)*	8.29
Total	20.83 (100)	9.72	23.17 (99)	8.47
Hostile Sexism				
Men	23.02 (50)	10.20	24.14 (49)	9.78
Women	21.50 (50)	9.99	21.08 (50)	9.36
Total	22.26 (100)	10.08	22.60 (99)	9.64
Total Ambivalent Sexism Score				
Men	49.14 (50)	14.78	48.84 (49)	15.30
Women	37.02 (50)	16.38	42.76 (50)	15.22
Total	43.08 (100)	16.67	45.77 (99)	15.49
Sexual Arousal				
Men	6.44 (50)	.95	16.76 (49)*	4.56
Women	6.18 (50)	.48	16.42 (50)*	5.86
Total	6.31 (100)	.76	16.59 (99)*	5.23
Pornographic Manipulation Check				
Men	.16 (47)	.28	6.68 (49)*	2.12
Women	.20 (50)	.39	7.16 (50)*	2.09
Total	.18 (97)	.34	6.92 (99)*	2.11

Note: Missing values excluded. Numbers in parentheses represent *n*/cell. Possible range for included scales: Attitudes Toward Women Scale 21–84, with higher scores indicating more egalitarian attitudes toward women; Benevolent Sexism 0–55, with higher scores indicating stronger benevolent sexism; Hostile Sexism 0–55, with higher scores indicating stronger hostile sexism; Ambivalent Sexism 0–110, with higher scores indicating stronger ambivalent sexism; Sexual Arousal 6–30, with higher scores indicating stronger sexual arousal; Pornographic Manipulation Check Scores 0–10, with higher scores indicating a stronger view of the exposure material as pornographic.

**p* < .001; control versus experimental group independent sample *t*-test.

Table 2 Hierarchical Regression Analyses Predicting Attitudes Toward Women

	ΔR^2	β
Attitudes Toward Women		
Step 1	.03*	
Gender		.18*
Step 2	.05**	
Agreeableness		.24**
Step 3	.02	
Past Pornography Consumption		-.17
Step 4	.01	
Perceived Realism in Pornography		.11
Step 5	.01	
Exposure Group		-.08
Total ΔR^2	.12**	
<i>n</i>	200	

Note: Missing values excluded listwise.

* $p < .05$, ** $p < .01$

For benevolent sexism, the final model showed that gender, exposure group, and the interaction between gender and exposure group significantly predicted benevolent sexism. Specifically, male gender, experimental exposure to pornography, and the interaction between gender and experimental exposure to pornography were found to significantly predict higher benevolent sexism (Table 3). Graphical probing and simple slopes analyses of the interaction following Aiken & West (1991) showed that the effect of exposure to pornography on benevolent sexism differed for men and women. For men, the effect of experimental exposure to pornography on benevolent sexism was nonsignificant ($t = -0.86$, $df = 195$; $p = .39$). For women, the effect of experimental exposure to pornography on benevolent sexism was significant ($t = 3.72$, $df = 195$; $p < .01$) and moderately increased benevolent sexism (Cohen's $d = 0.54$).

For hostile sexism, the final model showed that agreeableness and the interaction between agreeableness and exposure group significantly predicted hostile sexism. Specifically, lower agreeableness and the interaction between agreeableness and experimental exposure to pornography significantly predicted higher hostile sexism (Table 3). Graphical probing and simple slopes analyses of the interaction following Aiken & West (1991) showed that the effect of exposure to pornography on hostile sexism was different across different levels of agreeableness. For participants high in agreeableness (i.e., one standard deviation above the mean agreeableness score) and average in agreeableness (i.e., at the mean agreeableness score), the impact of experimental exposure to pornography on hostile sexism was nonsignificant (both $p > .05$). However, for participants low in agreeableness (i.e., one standard deviation below the mean agreeableness score) the effect of experimental exposure

Table 3 Hierarchical Regression Analyses Predicting Benevolent Sexism, Hostile Sexism, and Total Ambivalent Sexism

	ΔR^2	β
Ambivalent Sexism Inventory		
<i>Benevolent Sexism (n = 200)</i>		
Step 1	.14**	
Gender		-.37**
Step 2	.01	
Agreeableness		-.11
Step 3	.00	
Past Pornography Consumption		-.08
Step 4	.00	
Perceived Realism in Pornography		.03
Step 5	.02*	
Exposure Group		.13*
Step 6	.04**	
Gender \times Exposure Group		.21**
Total ΔR^2	.22**	
<i>Hostile Sexism (n = 200)</i>		
Step 1	.01	
Gender		-.12
Step 2	.12**	
Agreeableness		-.35**
Step 3	.02	
Past Pornography Consumption		.16
Step 4	.01	
Perceived Realism in Pornography		-.11
Step 5	.00	
Exposure Group		.04
Step 6	.02*	
Agreeableness \times Exposure Group		-.14*
Total ΔR^2	.18**	
<i>Total Ambivalent Sexism (n = 200)</i>		
Step 1	.08**	
Gender		-.28**
Step 2	.07**	
Agreeableness		-.28**
Step 3	.01	
Past Pornography Consumption		.05
Step 4	.00	
Perceived Realism in Pornography		-.05
Step 5	.01	
Exposure Group		.10
Total ΔR^2	.17**	

Note. Missing values excluded listwise. * $p < .05$, ** $p < .01$

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to pornography on hostile sexism was significant ($t = 1.92$, $df = 195$; $p = .03$) and increased hostile sexism to a small degree (Cohen's $d = 0.27$).

For total ambivalent sexism, the final model showed that gender and agreeableness significantly predicted total ambivalent sexism. Specifically, male gender and lower agreeableness were found to significantly predict higher total ambivalent sexism.

These results were virtually identical when repeating the analyses by dividing participants into three groups based on their placement in the distribution of agreeableness, with participants scoring in the 0–33rd percentile being classified as low in agreeableness, participants scoring in the 34th–66th percentile as moderate in agreeableness, and participants scoring in the 67th–100th percentile as high in agreeableness. The reason for using this division of participants was to maximize the statistical power in the mediation analyses presented below while following the lead of comparable research in this area that also used this classification approach (see also Malamuth et al., 2012).

Thus, the results of the regressions generally supported study hypothesis two while supporting study hypothesis three only for the sexist outcome variable of hostile sexism.

Test of study hypothesis 4

H4: Sexual arousal will mediate significant associations, if any, between experimental exposure to pornography and sexist attitudes.

To test study H4, we employed the methods for testing single mediator models using structural equation modeling and bias corrected bootstrapping procedures (Kenny, Kashy, & Bolger, 1998; MacKinnon & Fairchild, 2009; Shrout & Bolger, 2002). Given that experimental exposure to pornography was found to significantly increase benevolent sexism among women and hostile sexism among low in agreeableness participants only (see also the regression analyses above), we restricted our mediation analyses to these subgroups.

As can be seen from Figure 1, among women, the initial correlation between our initial variable (experimental exposure) and the outcome variable (benevolent sexism) was .33 ($p = .002$; 95% CI: 2.47; 9.71), indicating a significant direct effect of experimental exposure to pornography on benevolent sexism among women. When including sexual arousal as a mediator, the correlation between experimental exposure and benevolent sexism, i.e., the direct effect, dropped to .05 and turned nonsignificant ($p = .73$). Further, both the mediated (indirect) effect of exposure to pornography on benevolent sexism via sexual arousal and the total effect of exposure to pornography on benevolent sexism (i.e., the combined indirect and direct effect) were found to be significant (mediated/indirect effect: $p = .02$; 95% CI: 1.10; 9.46; Total effect: $p = .002$; 95% CI: 2.46; 9.71). This is consistent with a model of full mediation and suggests that sexual arousal may be considered a mediator of the relationship between experimental exposure to pornography and benevolent sexism among women.

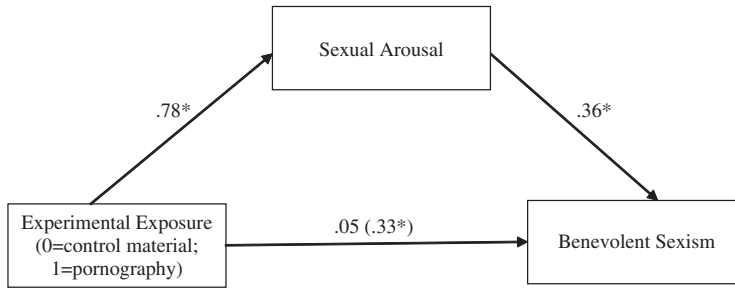


Figure 1 Mediating effect of sexual arousal on the increase in benevolent sexism that occurs after experimental exposure to pornography relative to control material among women. The standardized coefficients (correlations) are displayed. The standardized coefficient in parentheses represents the correlation between experimental exposure and benevolent sexism prior to the inclusion of sexual arousal in the model. * $p < .03$; ($n = 100$).

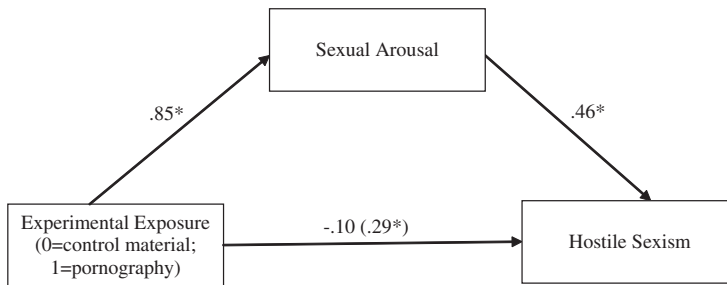


Figure 2 Mediating effect of sexual arousal on the increase in hostile sexism that occurs after experimental exposure to pornography relative to control material among low in agreeableness participants. The standardized coefficients (correlations) are displayed. The standardized coefficient in parentheses represents the correlation between experimental exposure and hostile sexism prior to the inclusion of sexual arousal in the model. ** $p < .01$, * $p < .05$; ($n = 68$).

As can be seen from Figure 2, among low in agreeableness participants (i.e., the lower 33% in the distribution of agreeableness), the initial correlation between our initial variable (experimental exposure) and the outcome variable (hostile sexism) was .29 ($p = .014$; 95% CI: 1.59; 10.72), indicating a significant direct effect of experimental exposure to pornography on hostile sexism among low in agreeableness participants. When including sexual arousal as a mediator, the correlation between experimental exposure and hostile sexism, that is, the direct effect, dropped to $-.10$ and turned nonsignificant ($p = .56$). However, both the mediated (indirect) effect of exposure to pornography on hostile sexism via sexual arousal and the total effect of exposure to pornography on hostile sexism (i.e., the combined indirect and direct effect) were found to be significant (mediated/indirect effect: $p = .003$; 95% CI: 2.74; 13.75; Total effect: $p = .014$; 95% CI: 1.59; 10.72). This is consistent with a model of full mediation and suggests that sexual arousal may be considered a mediator of

the relationship between experimental exposure to pornography and hostile sexism among low in agreeableness participants (Shrout & Bolger, 2002). Thus, the results of the mediational analyses fully supported H4.

Discussion

Partly supporting study hypothesis one and in line with sexual script theory (see Introduction) and cultivation theory (see also Ward, 2002), among men, increased past exposure to pornography was found to be significantly associated with less egalitarian attitudes toward women and more hostile sexism. This may be due to past pornography consumption being instrumental to the acquisition of some forms of sexist attitudes among some men (Wright, 2011; Wright, Malamuth, & Donnerstein, 2012). For example, by virtue of how women are portrayed (e.g., in stereotypical roles), act (e.g., stereotypical sexual behaviors), react (e.g., to male sexist language and behaviors), or engage their sexuality (e.g., to arouse or manipulate men) (Bridges *et al.*, 2010; Peter & Valkenburg, 2011).

Using a higher-order, well validated, and widely used measure of personality, the study results consistently demonstrate the importance of considering personality, that is, agreeableness, when investigating effects of pornography on sexist attitudes. Specifically, the consistent finding of higher levels of sexist attitudes among lower in agreeableness individuals and personality moderation of effects of exposure of pornography on hostile sexism support study H2 and partly H3 and may have wider implications for media research. Indeed, in a recent paper investigating links between habitual media violence, exposure, aggressive cognitions, and aggressive behavior, Krahé & Möller (2010) emphasized that dispositional factors (e.g., personality) may be a “third variable” able to explain significant relationships between investigated variables. Accordingly, personality (herein agreeableness) may both promote the exposure to certain types of media (herein pornography) and the effect on the dependent variable(s) investigated (herein sexist attitudes), at least among some individuals (Stulhofer *et al.*, 2012). This is tentatively supported by data from this study showing that when agreeableness is controlled for, past pornography consumption no longer holds significant associations with any of the sexist attitudes investigated. Consequently, associations between past pornography consumption and dependent variable(s) investigated may partly or better be accounted for by dispositional factors or other individual differences (see also Luder *et al.*, 2011; Mckee, 2007; Hald, Kuyper *et al.*, 2013).

Given the characteristics of individuals low in agreeableness as more antagonistic, cold, hostile, suspicious, disagreeable, and unfriendly, the finding of experimental exposure effects of pornography on hostile sexism among this subgroup fits the core contention by the Hierarchical Confluence Model of Sexual Aggression. That is, effects of pornography will be evident only among the subgroup(s) of users most likely to hold high levels of such attitudes (Kingston *et al.*, 2009; Malamuth, 2003), which in this study was hypothesized, and for hostile sexism found, to be low in agreeableness individuals.

The study found that experimental exposure to pornography increased benevolent sexism among women only. We are unsure exactly how to interpret this result. On the one hand it may be a chance finding as no other prior comparable research has found a similar result. However, the body of research in which to contextualize this result is still small which, should caution against such conclusion. On the other hand, even highly egalitarian societies such as the Danish society (Hald, 2006) where the study was conducted may “promote” benevolent sexism on a relational and societal level via culturally mediated messages that in content or feeling tone are similar to that of benevolent sexism. These or related messages may in particular be attended to and internalized by women and/or more easily primed among women in sexual situations (Stulhofer et al., 2012). Indeed, in a recent review on traditional gender role adherence and sexuality, Sanchez et al. (2012) found that men and women have automatic associations between sexuality and power that reinforce gender stereotypic behavior in sexual contexts with women being submissive and men dominant. Consequently, in sexual situations, if submissiveness is associated with benevolence due to the priming of associated networks of benevolence through submissiveness this may help account for this finding. We acknowledge that this explanation is tentative and needs empirical validation.

In this study, perceived realism of pornography was found not to predict sexist attitudes or moderate the relationship between experimental exposure to pornography and sexist attitudes. This may be because perceived realism of pornography works more as a mediator of effects of pornography than as a predictor or moderator (Peter & Valkenburg, 2006, 2010), or, alternatively, that perceived realism of pornography is more indirectly related to the outcome variables investigated (here sexist attitudes). Indeed, in a recent study, Stulhofer et al. (2012) demonstrated that perceived realism of pornography was indirectly related to relationship intimacy through acceptance of recreational sex.

Overall, the study findings of sexual arousal mediation are consistent with the core presumptions by the media literature on affective engagement (Clore & Schnall, 2005; Ward, 2002) and priming effects (Hansen & Krygowski, 1994; Roskos-Ewoldson et al., 2009; Wright, 2011) that affective activation (herein sexual arousal) may serve as an important mediator of significant exposure-attitudinal relationships and be central to the priming of “associative networks” of emotions, cognitions, and attitudes which in content or feeling tone correspond to the attitudes investigated (i.e., herein sexist attitudes). At least partly, it may be that these associative networks have been established and shaped through the basic principles of social learning theory and are perceived and attended to according to the principles of sexual script theory (see also the Introduction). That is, among some individuals, sexist cognitions and attitudes may partly have been learned through specific environments, scenarios, and role models on the basis of reinforcement and vicarious learning. These sexist cognitions and attitudes may, in sexual situations, be activated by sexual scripts if these are attuned to content or feeling tones sexist in nature (Sanchez et al., 2012). Accordingly, these sexual scripts may themselves be activated by exposure to sexual

media (Wright, Malamuth, & Donnerstein, 2012; Wright *et al.*, 2012) provided such media is attended to and engaged in, something considerably more likely to happen through affective engagement of the sexual media material (Clore & Schnall, 2005; Ward, 2002). Thus, among some individuals, exposure to pornography may prompt sexual scripts sexist in nature, and/or their associated sexist cognitions and attitudes, and provide the affective engagement, via sexual arousal, needed to engage these sexist scripts, cognitions, and attitudes.

Following an acquisition, activation, application perspective on mass media effects (see also Wright *et al.*, 2012) and social learning theory (Bandura, 1986) application of acquired and activated sexist cognitions and attitudes to behaviors may depend on content factors (e.g., rewards or punishment), audience factors (e.g., model similarity, moral standards), and situational factors (e.g., time pressure, sexual arousal) as well as the evaluative and automatic thought processes guiding these factors and behaviors. Consequently, importantly, the application of activated sexist cognitions and attitudes to behaviors, however brought about, does not happen automatically but depends on a number of other intervening factors (Wright *et al.*, 2012).

At least four limitations pertain to this study. First, although the experiment used the largest sample to date for this kind of experimental research, some of the stratified analyses resulted in small cell sizes. This limits the power of the analyses, increases the risk of Type II errors, and potentially affects the reliability of the study's findings. Second, for one of the measures, namely the Attitudes Toward Women Scale, the reliability was questionable. This may limit both the validity and/or reliability of the study's results pertaining to this particular measure. Third, the study demonstrated only a short-term effect of exposure to nonviolent pornography that may not remain over time and/or may differ in magnitude across different types of exposure materials, as demonstrated by, for example, Hald *et al.* (2010). Fourth, although in a recent meta-analysis Hald *et al.* (2010) have shown that in general the conclusions emerging from nonexperimental studies on attitudes supporting violence against women are fully consistent with their counterpart experimental studies, it is important to be cautious about generalizing from the present study's findings on sexist attitudes. That is, the study's results may be affected by the experimental design and may not fully generalize to naturalistic settings in which the context of use, choice of pornography, length of exposure, etc., may differ substantially from that of the current experiment (Mckee, 2007).

The study provides novel support for core presumptions by the media and communication literature on affective engagement and priming effects and for one of the core contentions of the Hierarchical Confluence Model of Sexual Aggression. In addition, the study demonstrates the influence of personality and affective states on attitudes in media research and shows the importance of measuring both relevant traits (herein agreeableness) and states (herein sexual arousal) in media and related research. Further, the study provides new contributions to pornography and related research by (a) being the first study to simultaneously assess and combine previous pornography consumption in naturalistic settings with experimentally manipulated

exposure to pornography and assess their implications for sexist attitudes, (b) showing a key moderating effect of the “higher-order” personality dimension of agreeableness on the pornography exposure-attitudinal relationships investigated, and (c) demonstrating sexual arousal mediation, that is, that the significant pornography exposure-sexist attitudinal relationships found were mediated by sexual arousal.

Acknowledgments

The study was supported in part by grants from the Health Insurance Foundation and the Augustinus Foundation.

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