

# Revisiting Media Priming Effects of Sexual Depictions: Replication, Extension, and Consideration of Sexual Depiction Strength

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*Two experiments were used to examine how sexual media primes influence perceptions of an unknown target's sexual characteristics and ultimate ratings of the target's appeal. Participants were randomly assigned to one condition of a fully crossed 3 (control, weak sexual, or strong sexual media prime) × 3 (general, dating, or professional social networking profile) design. Participants were first exposed to a website that contained banner and sidebar advertisements that were either high in explicitness and emphasis on sexual intercourse, low in explicitness and emphasis on intercourse but still related to sex, or devoid of sexual cues altogether. These banner and sidebar areas constituted the prime. Participants then rated the sex-related qualities and overall appeal of a target represented by an online social media profile from Facebook.com, LiveJournal.com, BlackBookSingles.com, or LinkedIn.com. Findings supported the main hypothesis that sexual media enhance the perceived sexual characteristics attributed to the target represented in social media and that these characteristics significantly contribute to evaluating overall appeal. Both sexual media primes yielded effects that were robust across social network profiles. Results are discussed in light of literature that analyzes sexual content in media.*

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Sexually suggestive themes are as ubiquitous in the media as the media are in our society. These themes are found across media platforms and throughout news, entertainment, and advertising content (e.g., Fisher, Hill, Grube, & Gruber, 2004; Kunkel, Eyal, Finnerty, Biely, & Donnerstein, 2005). For some time, parents and policymakers have been observing, with worry, the increasing amount of sexual content to which media users have been exposed (e.g., American Academy of Pediatrics Committee on Communications, 1996; Gore, 1987). Researchers have likewise been studying the potential negative influences of sexual media (e.g., Brown & L'Engle, 2009; Eyal & Kunkel, 2008; Ward, 2002), and romantic media to a lesser extent (e.g., Holmes, 2007).

The purpose of this study is twofold. First, in two experiments, this study provides a systematic, conceptual replication of the media priming research testing how sexual depictions influence the way people perceive others (e.g., Carpentier, Knobloch-Westerwick, & Blumhoff, 2007; Hansen, 1989; Hansen & Krygowski, 1994). Second, this study extends the literature by evaluating whether priming effects differ based on the degree of emphasis on sex in media depictions. Analyses of sexual media content tend to code sexual depictions based on the degree of explicitness and emphasis on sex in order to gauge the overall extent of sex being presented in the media content (e.g., Kunkel et al., 2005). In this study, media primes with a high versus low emphasis on sex are compared with each other and with a control group to evaluate their effect in changing the way we view others.

## PRIMING WITH MASS MEDIA

Media have the capability of altering the standards we use when forming impressions of others (see Roskos-Ewoldsen, Roskos-Ewoldsen, & Carpentier, 2008, for review). When we are exposed to a media stimulus, this stimulus primes, or triggers, ideas in our minds that are related to what we've just seen or heard in that stimulus. For example, a woman might see a sexually suggestive commercial for Axe men's body spray while watching the local television newscast. Now, ideas about men's bodies and male attractiveness move to the forefront of her mind. The concepts activated by the advertisement awaken related mental representations, such as male sexuality and sexual encounters. This constellation of now-accessible concepts alters the lens she uses to understand and evaluate new input, for example, forming her first impression of a new person. Likely, her impression reflects the primed ideas, such that this person is judged heavily on sexual characteristics. Had she not been exposed to this suggestive commercial, the woman might have weighed her impression very little on sexual qualities.

This model of how media yield priming effects through initial triggering and spreading activation is based on models of semantic memory (see

Tulving, 1972) and on network models of memory, in particular (e.g., A. M. Collins & Loftus, 1975; Neely, 1977). An individual concept is represented as a node in a web, or network, of nodes in memory. The strength of association between any two concepts is represented as the physical distance between nodes. The closer the nodes are, the more strongly related the concepts are (see also Meyer & Schvaneveldt, 1971).

Applied to the study of social judgments, priming a concept makes that concept a more likely criterion we will use to judge others, especially if the others being evaluated are ambiguous or unknown to us (e.g., Srull & Wyer, 1979; see also Bargh, 2006; Higgins, 1996). Specifically, a prime triggers a concept in the network beyond its resting threshold, making this concept active and easily accessible in memory. If the prime is strong enough, the activation will spread to closely related nodes, elevating the entire body of related concepts to the top of one's mind. These activated concepts are now the dominant concepts we are likely to use when judging others, provided the concepts are relevant to the judgment (e.g., Domke, Shah, & Wackman, 1998; Meyers-Levy & Tybout, 1989; Shen & Chen, 2007; Yi, 1993). With few exceptions, the typical effect is one of assimilation, in which the judgment is biased toward the direction of the prime (e.g., Higgins, Rholes, & Jones, 1977; Srull & Wyer, 1980). The strength of the effect is assumedly determined by the strength of the triggering event (Higgins, Bargh, & Lombardi, 1985; also Holbrook & Hill, 2005), although this assumption is understudied for effects on social judgments (see Dillman Carpentier, Roskos-Ewoldsen, & Roskos-Ewoldsen, 2008, and Roskos-Ewoldsen, Klinger, & Roskos-Ewoldsen, 2007, for reviews).

Mass media are very successful in triggering a myriad of concepts that serve as primes affecting later thoughts and behaviors (see Roskos-Ewoldsen et al., 2007, for meta-analysis). For example, media messages containing depictions of violence tend to elevate feelings of aggression in its consumers, leading to outcomes from perceptions that others are hostile to acting aggressively toward others (see Berkowitz, 1990). These effects have been observed for music (e.g., Anderson, Carnagey, & Eubanks, 2003; C. H. Hansen & Hansen, 1991), video games (e.g., Anderson & Dill, 2000), and television (e.g., Bushman & Geen, 1990). Media characterizations of ethnic or racial minorities have been shown to trigger negative stereotypes in media users' minds, leading these users to stigmatize others identified as being members of the depicted race or ethnicity (e.g., Brown Givens & Monahan, 2005; Domke, 2001; Valentino, Hutchings, & White, 2002). Media attention to certain political issues in neglect of others will influence how voters judge politicians; voters will focus their own judgments on the political figure's performance on the primed issues (see Price & Tewksbury, 1997).

Effects of media messages that trigger the concept of sex vary based on the contextualization of the sexual prime. For example, priming stereotypical

sex roles in music videos seems to lead viewers to form their first impressions of real men and women in line with those stereotypes (C. Hansen & Hansen, 1988). Exposure to media suggesting that individuals are sex objects encourages the evaluation of others as sex objects, as well. Illustrating this finding, Hansen and Krygowski (1994) had people watch a music video with or without sexual imagery and then view a commercial featuring a physically attractive actor. Those exposed to the sexualized music video viewed the actor as more of a sex object, as opposed to participants exposed to the other video.

Carpentier et al. (2007) tested the extent to which sexually suggestive popular music biased judgments of potential romantic partners toward sexual themes. After listening to music with either sexual or nonsexual lyrics, participants evaluated a new online dating service, which presented ambiguous profiles (e.g., likes pizza) of individuals of the opposite sex. Participants rated the individuals on various characteristics and finally provided an overall assessment of how attractive the individuals seemed to the participants. Results indicated that sex-related characteristics were more important in judging overall attractiveness for participants who listened to sexual music, as opposed to those who listened to nonsexual music.

Carpentier et al. (2007) represents one of very few studies that examine sexual media priming effects in the context of network models, in that the prime was observed to elevate sexual characteristics, which, in turn, influenced the overall impression made of the target. Most of the evidence in this body of work shows direct effects of the prime yielding assimilative effects on judgments of sexual characteristics, which is the most immediate consequence of triggering the concept of sex (see C. H. Hansen & Hansen, 2000, for review). This body of work also tends to examine effects of sexual content based on whether the sexual depictions are present or not present. However, given the rich literature describing and quantifying sexual content in media, might priming effects differ depending on the degree of sex depicted in the media?

The little media research on priming intensity that exists demonstrates that the intensity of a priming event will intensify how the prime biases our evaluations of others. Priming intensity in this area has as yet been operationalized only in terms of the length (Appel, 2011; Carpentier et al., 2008) or repeated frequency of the prime (Iyengar, Kinder, Peters, & Krosnick, 1984; Miller & Krosnick, 1996), with more successful and consistent effects for frequency than for length of manipulations. However, research in neuroscience suggests that vivid imagery activates neural networks more strongly (e.g., Slotnick, Thompson, & Kosslyn, 2012) and produces stronger short-term priming effects (e.g., Thomson & Milliken, 2012). We argue that a more explicit depiction of sex will constitute a more visually vivid and, therefore, stronger prime than will a depiction with less explicitness and emphasis on the act of sex.

## SEXUAL CONTENT IN MASS MEDIA

As previously noted, researchers pay significant attention to the relationship between sexual attitudes and behaviors and exposure to sexually suggestive mass media (e.g., Baran, 1976; Brown & L'Engle, 2009; Chandra et al., 2008; Collins et al., 2004; Collins, Martino, Elliott, & Miu, 2011; Eyal & Kunkel, 2008; Holmes, 2007; Pardun, L'Engle, & Brown, 2005; Ward, 2002; Ward & Friedman, 2006; see Gunter, 2002, for review). When measuring or operationalizing media sex in their studies, many of these scholars turn to the extensive work of Kunkel and colleagues, who have defined the way sexual content is analyzed in mass media (e.g., Collins et al., 2004; Kunkel, Eyal, Donnerstein, Farrar, Biely, & Rideout, 2007; Kunkel et al., 2005; see also Manganello et al., 2010). In this research, sexual behaviors are coded and, thus, differentiated, based on their explicit nature. Physical flirting, passionate kissing, and intimate touching are unique categories that differ from implied sexual intercourse and depicted sexual intercourse. In addition to these distinctions, scenes are also rated for their emphasis on sex, as well as their degree of explicitness. Emphasis on sex considers the focus of the scene, and if the sex in the scene consequential or inconsequential to the plot. Degree of explicitness considers the amount of nudity shown or suggested. For example, a scene is considered to be low in explicitness if there are no depictions of disrobing and if normally clothed parts of the body remain clothed. Explicitness increases if a character is provocatively dressed and if the characters are shown disrobing. Scenes are considered highly explicit if there is partial or full nudity or if nudity is implied.

## PURPOSE OF STUDY

The present study compares priming effects of sexual content that is high in explicitness and emphasis on sexual intercourse versus sexual content that is low in explicitness and emphasis, all versus a control condition with no sexual content. Priming effects are evaluated in line with a network model approach, in that primes are thought to trigger sexual thoughts, which, in turn, should influence overall impressions made of an ambiguous target. Thus, this study constitutes a conceptual replication of Carpentier et al. (2007).

In addition, this study goes beyond existing work in considering the degree of sexual depiction as a manipulation of priming intensity. Characterizing sex in a more explicit manner is likely to trigger more concrete mental depictions of sexual intercourse or foreplay due to its focus on the act of sex itself. Therefore, we propose that an explicit sexual prime will provide a more direct and vivid activation of mental representations of sexual intercourse, compared with a less explicit sexual prime that directly triggers

representations related to intercourse but not actual intercourse (in other words, activation must spread from the primed concept to the concept of sexual intercourse).

Finally, this study evaluates the robustness of these effects for different presentations of the ambiguous target **to see if effects appear when target venues do not directly reference dating relationships**. As noted above, previous research has tested sexual priming effects for evaluations that are located within the sexual context, for example potential dating partners. Although there is no evidence to suggest that sexual primes will not bias evaluations of people presented outside of a sexual context, it is nonetheless worth testing this supposition in light of evidence that primes work best when the primed concept is obviously applicable to the evaluation target (e.g., Higgins, 1996; Price & Tewksbury, 1997). It is conceivable that sexual concepts might be less applicable to targets presented in social media venues such as LinkedIn, LiveJournal, or Facebook, compared to targets within an online dating site. Of these sites, the professional context of LinkedIn might provide the most resistance to the application of sex in evaluating the target, whereas the context of the online dating site might yield the strongest priming effects.

The following hypotheses and research question are addressed in two similar experiments, an initial test and replication conducted in a different geographic location, in efforts to ensure that findings are not likely the product of chance or due to specifics of the sample.

- H1: Compared to a control condition, sexual primes will elevate the perceived sexual characteristics participants attribute to the target.
- H2: Compared to weak sexual depictions, strong sexual depictions will elevate the perceived sexual characteristics participants attribute to the target.
- H3: Perceptions of sexual characteristics will mediate the relationship between primes and evaluations of the target's overall appeal, such that elevated perceptions will correspond with more positive appeal.
- RQ: Will the way in which the target is presented influence the strength of the priming effect?

## EXPERIMENT 1

### Design and Procedure

Participants were randomly assigned to one condition of a fully crossed 3 (control, weak sexual, or strong sexual prime)  $\times$  3 (general, dating, or professional social networking profile) experimental design. The priming event consisted of an online activity placed within a website template that included banner and side advertisements that reflected one of the priming conditions.

Participants were asked to engage in the online activity, for example playing dominos or Sudoku (Flash-based games). The advertisements were present throughout their game play.

Participants then viewed an online profile from Facebook.com, BlackBookSingles.com (a dating site affiliated with Facebook), or LinkedIn.com. In each case, names, photos, and gender-identifying information were blacked out. This tactic ensured the ambiguity of the profile owner and enabled profiles to apply to either a male or female. This was important for the dating profile condition, as participants were told they were viewing profiles of members of the opposite sex (same sex was suggested for respondents identifying their sexual orientation as homosexual). Profile information was devoid of overt sexual cues for all conditions.

For all profiles, participants rated how much a certain adjective described the profile owner. Adjectives (35 in total) reflected a mix of characteristics, in part to deflect attention from the four key characteristics relating to sex. Participants then indicated how appealing, overall, this person seemed. A final set of demographic and psychographic items were presented and then participants were debriefed and dismissed.

## Participants

One hundred forty-four participants were recruited from lower-level mass communication courses at a large university in the southeastern United States. The majority of participants were women (84.0%) between 19 and 21 years old (86.8%, range = 18 to 29), and heterosexual (95.7%).

## Priming Stimulus

Priming stimuli were embedded in a webpage created from a screenshot of FreeWorldGames.com. The full image size was approximately 11 inches wide × 11 inches high. The template was partitioned into an upper banner section, a side banner section, and a primary rectangular field justified to the lower right. Top banner (7.6 inches × 1.2 inches) and sidebar (2.5 inches × 8.7 inches) sections varied according to condition, such that 25% of the viewing space was covered by the priming stimuli.

Activities devoid of sexual cues were embedded into the primary rectangular field to provide interactive content for participants to use (i.e., neither Dominos nor Sudoku contain words or sexual imagery). Activities were selected for inclusion based on their delivery as a Flash program, the absence of advertisements in the program, and their ability to be embedded into the website template and the Qualtrics online survey delivery platform. Analyses indicate that the specific Flash content did not influence the effectiveness of the prime or the subsequent evaluations ( $F_s < 1$ ).

## CONTROL CONDITION

The control condition featured a top banner ad picturing two cellular phones and the text, “Samsung Deals from AT&T.” The sidebar featured no ads. Instead, the upper half of the sidebar contained a window with two tabs labeled “Recent” and “Favorites” with a message in the middle of this window saying “No saved recents!” and a lower menu bar with two triangle icons indicating Up ( $\Delta$ ) and Down ( $\nabla$ ) search functions, a “C” indicating a clearing function, a page number indicator (“1/1”) and a grayed-out alpha search function (“A-Z”). The blue background color filled this sidebar. Ad usage in the control condition was sparse in attempts to avoid inadvertent priming of concepts that might be related to sexuality or other personality characteristics and, thus, might influence participant ratings of the target.

## WEAK SEXUAL CONDITION

The weak sexual condition depicted sexual content that would not be considered high in its emphasis on sex or its degree of explicitness, based on definitions by Kunkel et al. (2007) and others. The top banner ad was a Netflix ad that featured DVD cover images for the movies, *Romeo + Juliet* (1996), *Ever After: A Cinderella Story* (1998), *Love Jones* (1997), and *The Notebook* (2004). In each case, the cover image featured a man and woman fully clothed in a close embrace either about to kiss or kissing. In this ad, passionate kissing was portrayed but intimate touching was not. There was also no explicitness in this ad. The top sidebar ad was for Ralph Lauren Romance (perfume) and featured a woman at the beach in a flowing pink dress, back and leg partly exposed. No sexual behavior was depicted, and the provocative dress indicated a low degree of explicitness. Lower sidebar ads included a Valentine’s Day heart-shaped cake and a dozen red roses. No bedrooms were depicted in any advertisement. There was no overt emphasis on sexual intercourse.

## STRONG SEXUAL CONDITION

In the strong sexual condition, the top banner ad was from Victoria’s Secret and featured a woman in a small gold bikini lying on her back, back arched, on a beach. She was looking seductively at the camera, her face and chest facing toward the camera, feet toward the water. This advertisement was focused on sexuality, and the combination of skin exposure and body positioning suggested a relatively high degree of explicitness. The top sidebar ad showed a man’s reflection in a Zippo lighter wearing a tux with bowtie untied and shirt unbuttoned. A woman, nude on the top, was sitting on a bed in the background, her exposed back to the camera, her face toward what one might assume is the man holding the lighter. She was wrapped from the waist down in a bed sheet. This scene was also focused on sex and had a relatively high degree of explicitness given the implication of nudity



and sexual intercourse. The bottom sidebar ad was a close-up face shot of a woman modeling mascara, wearing a seductive expression with parted red lips and smoky eyes.

## Target Profile

Online profiles of the targets were created from screenshots of real profiles. Names, photographs, and any other revealing personal information was covered with black squares. Personal description text from the real profiles was covered with new text, which controlled for potential confounds due to differences in content across the different profiles. Profile content contained no overt sexual cues.

### GENERAL

Representing the general profile was a Facebook profile featured the target's info page. This page featured an arts and entertainment section, an activities and interests section, and a basic information section, which was cut off before any basic information could be viewed. Under the arts and entertainment heading, participants viewed icons representing the target's favorite music genres: dance electronic, hip hop/rap, alternative rock, some metal, and country and reggae. An icon for Blue Collar Comedy Tour was displayed under this category as a favorite movie. Under the activities, the target had the following icons listed: four wheeling, mudding, boating, camping, I Love Shopping, I Love Partying, All the time, and IKEA. A Cars and cooking icon was listed under interests.

### DATING

The online dating profile was created from the BlackBookSingles dating site and featured this description of the target:

I recently moved to the area, and I don't know anyone here. I've found a few interesting places to hang out, but you can only have so much fun hanging out by yourself. I'm hoping to find some people who are interested in making a new friend. :)

About describing myself . . . Hmm. I can usually be thrown into a group of people and find my way around, mingling with strangers and what have you. Sometimes I'll end up being the center of attention (I like to be funny, and hey, it gets peoples' attention!), and other times I'll end up just chilling out and having a simple conversation with a couple people.

I'm pretty laid back and open-minded when it comes to deciding what to do. Whether it be going out and socializing at a bar or club, getting a cup of coffee, heading to the Barnes & Noble to peruse the books, or

ordering in and watching a movie on the couch, I'm pretty much up for anything.

I enjoy listening to music, especially when driving or working on the computer. I'll generally give any music a chance ...

#### PROFESSIONAL

Representing the professional profile, a LinkedIn profile was chosen based on its relative lack of information about the owner's personal character. The current employment and experience sections indicated jobs as a photo editor, an art editor, and a freelance photographer. Additional information indicated that two people had recommended this person. Two hundred people were connected with this person.

### Measures

#### SEXUAL CHARACTERISTICS

Of interest to this study, participants rated how much they thought the profile owner was sexy, alluring, attractive, charming, and seductive. Ratings were on a 5-point scale ranging from *not at all* (1) to *extremely* (5). These five items were averaged into a composite measure indicating sexual qualities,  $\alpha = .81$ ,  $M = 2.34$ ,  $SD = .68$ .

#### OVERALL APPEAL

A single item asked participants how appealing the target seemed, based on their profile. Participants rated the target's overall appeal on a 5-point scale ranging from *not at all* (1) to *extremely* (5),  $M = 2.84$ ,  $SD = .94$ . Overall appeal correlated positively with sexual characteristics,  $r = .57$ ,  $p < .001$ .

### Experiment 1 Results

#### PRELIMINARY ANALYSES

The first hypothesis predicted that sexual primes would influence perceptions of the target's sexual characteristics, which, in turn, would influence ratings of overall appeal. The second hypothesis predicted that the strong sexual prime would outperform the weak sexual prime. Prior to addressing these hypotheses, two preliminary analyses of variance (ANOVAs) were performed using priming condition (control, weak sexual, strong sexual) and target profile (general, dating, professional) as independent factors. Initial analyses considering effects of participant gender or other demographics yielded little appreciable variation and were therefore dropped from further analysis.

The first ANOVA used overall appeal as the dependent variable. This analysis found a significant main effect of target profile,  $F(2,135) = 11.75, p < .001, \eta^2 = .15$ . Bonferroni post hoc pairwise comparisons indicated that the LinkedIn target was significantly more appealing than either the Facebook or BlackBookSingles targets,  $M_{\text{professional}} = 3.33, SD = .83; M_{\text{general}} = 2.68, SD = .92; M_{\text{dating}} = 2.49, SD = .88$ . The latter two profiles were equally appealing. Priming condition did not have a significant direct effect on overall appeal,  $F < 1$ . The interaction between priming condition and target profile was not significant,  $F < 1$ .

The second ANOVA evaluated direct effects on perceived sexual characteristics. Priming condition had a significant main effect on these perceptions,  $F(2,135) = 3.27, p = .041, \eta^2 = .04$ . According to Bonferroni pairwise comparisons, the control condition yielded significantly lower ratings of sexual characteristics than either the weak sexual or strong sexual conditions,  $M_{\text{control}} = 2.18, SD = .64; M_{\text{weak}} = 2.53, SD = .70; M_{\text{strong}} = 2.33, SD = .67$ . The sexual conditions did not differ. No other effects were found.

#### ANALYSIS OF HYPOTHESES

To directly evaluate the hypotheses, a mediation analysis was performed using the Indirect SPSS macro for estimating direct and indirect effects via bootstrapping (see Preacher & Hayes, 2008). Results of the preliminary ANOVAs and subsequent mediation analyses demonstrated no appreciable variation due to target profile. Thus, target profile was dropped from further analysis. Rather, priming condition was contrast coded (sexual primes vs. control and strong sex vs. weak sex), and the resulting variables were entered as independent variables. The perceived sexual characteristics measure was entered as a mediator. The overall appeal measure was the dependent variable.

Results supported Hypothesis 1. As seen in Table 1, exposure to sexual media primes led to increased attribution of sexual characteristics,  $p = .03$ . This exposure constitutes both the weak and strong sexual prime conditions, comparing these with the control condition. However, strong sexual primes did not differ from weak sexual primes in their influence on sexual characteristics ratings, which does not support Hypothesis 2,  $p = .15$ . Ratings of sexual characteristics then positively predicted ratings of overall appeal supporting Hypothesis 3,  $p < .0001$ . The indirect effect of sexual primes (vs. control) on overall appeal was significant,  $B = .07, SE B = .03, CI_{95} = .01$  to  $.13, p < .05$ .

In address of the research question, all analyses within Experiment 1 indicate that the priming effects were unaffected by the selected target profiles. In this case, the manner in which the ambiguous target was presented did not enhance or lessen the extent to which the concept of sex, triggered in either a less-explicit or more-explicit media prime, influenced perceptions.

**TABLE 1** Indirect Effect of Sexual Primes on Overall Appeal via Sexual Characteristics

Predictors	Regression coefficients		
	<i>B</i>	<i>SE B</i>	<i>p</i>
Predicting sexual characteristics			
Sexual primes vs. control	.08	.04	.03
Weak vs. strong sexual primes	-.10	.07	.15
$R^2 = .05, F(2,141) = 3.37, p = .04$			
Predicting overall appeal			
Sexual primes vs. control	-.03	.05	.47
Weak vs. strong sexual primes	.02	.08	.82
Sexual characteristics	.81	.10	<.0001
$R^2 = .33, F(3,140) = 23.17, p < .0001$			

*Note.* Table 1 represents the hypothesis test for Experiment 1. Values are the result of a mediation analysis performed in the Indirect macro for SPSS. The indirect effect of sexual primes vs. control was significant,  $B = .07, SE B = .03, CI_{95} = .01$  to  $.13, p < .05$ . The indirect effect of weak vs. strong sexual primes was not significant,  $B = -.08, SE B = .06, CI_{95} = -.20$  to  $.03, ns$ . Number of samples for bootstrapping = 1000.

## EXPERIMENT 2

### Design and Procedure

Experiment 2 constituted a near-identical replication of Experiment 1 using a different sample of participants obtained from another geographic location within the United States. The same design and procedure from Experiment 1 was repeated in Experiment 2, with one exception. The target profiles differed slightly from the first experiment in order to see if Experiment 1's findings could be replicated with different target stimuli. Specifically, Experiment 1 employed a profile from Facebook, BlackBookSingles, and LinkedIn. Experiment 2 also used BlackBookSingles and LinkedIn profiles, but replaced the Facebook profile with a LiveJournal profile. The people represented in the profiles in Experiment 2 differed from the people represented in the Experiment 1 profiles, as well. Profile information, however, remained devoid of sexual cues. The priming stimuli remained the same.

### Participants

Two hundred sixteen university students participated in the experiment. In Experiment 2, lower-level mass communication courses from a large university in the southwestern United States served as the recruitment pool. Many of the participants in this second study were women (62.5%) between 19 and 25 years old (66.7%, range = 18 to 58). Most of the participants were heterosexual (92.0%).

## Target Profile

Screenshots were taken from real profiles on LiveJournal, BlackBookSingles, and LinkedIn to represent general, dating, and professional social networks, respectively. LiveJournal replaced Facebook in this experiment. Names, photographs, and other revealing personal information was covered with black squares. New text covered other personal descriptions. Profile owners from the LiveJournal and BlackBookSingles sites were described similar to the first experiment profiles. The first paragraph indicated the target had just moved to the area and is hoping to meet new people to hang out. The target then describes him/herself in terms of tendencies toward extraversion (mingling) or nonsexual intimacy (interaction with one or two people). Favorite activities include getting coffee, reading books, and watching movies. The LiveJournal profile also included current events, funny stories and anecdotes, government, life, Oprah scares me, politics, and writing among the target's list of interests. All profiles indicated the target was just out of college and living in the northeastern United States. Profiles were gender neutral. Details of these profiles differed slightly from the profiles used in Experiment 1, for example indicating different places and dates of employment, different hometown in the northeast, or a different type of pet.

## Measures

### SEXUAL CHARACTERISTICS

A composite score was again created from ratings of how much the target was sexy, alluring, attractive, charming, and seductive,  $\alpha = .78$ ,  $M = 2.98$ ,  $SD = 1.02$ . Ratings were on a 5-point scale from *not at all* (1) to *extremely* (5).

### OVERALL APPEAL

Participants rated the target's overall appeal on a single item using a 5-point scale ranging from *not at all* (1) to *extremely* (5),  $M = 2.58$ ,  $SD = .75$ . Overall appeal correlated positively with sexual characteristics,  $r = .57$ ,  $p < .001$ .

## Experiment 2 Results

### PRELIMINARY ANALYSES

Before addressing the hypotheses, two ANOVAs were performed using priming condition (control, weak sexual, strong sexual) and target profile (general, dating, professional) as independent factors. Initial tests using participant gender and other demographic data yielded no effects and were dropped from the analyses. The first ANOVA used overall appeal as the dependent variable. A significant main effect was found for target profile,

$F(2,207) = 5.00, p = .008, \eta^2 = .05$ . Bonferroni pairwise comparisons indicated that the LinkedIn target was significantly more appealing than the LiveJournal target and marginally more appealing than the BlackBookSingles target,  $M_{\text{professional}} = 3.28, SD = .91$ ;  $M_{\text{general}} = 2.77, SD = .96$ ;  $M_{\text{dating}} = 2.88, SD = 1.13$ . The latter two profiles were statistically equivalent. No other effects were found.

The second ANOVA evaluated direct effects on perceived sexual characteristics. Priming condition yielded a significant main effect,  $F(2,207) = 3.41, p = .035, \eta^2 = .03$ . Bonferroni post hoc tests indicated that control condition ratings were significantly lower than either the weak sexual or strong sexual conditions,  $M_{\text{control}} = 2.40, SD = .74$ ;  $M_{\text{weak}} = 2.65, SD = .82$ ;  $M_{\text{strong}} = 2.69, SD = .66$ . The sexual conditions did not differ. No other effects were found.

#### ANALYSIS OF HYPOTHESES

Hypothesis 1 proposed that, compared to a control condition, sexual primes would lead to elevated ratings of the target's sexual characteristics, which, in turn, would elevate ratings of overall appeal. The second hypothesis proposed that the strong sexual prime would yield stronger effects than the weak sexual prime. To test these hypotheses, priming condition was first contrast-coded and then entered as the independent variable in a mediation analysis performed using the Indirect SPSS macro. Perceived sexual characteristics served as the mediator. Overall appeal was the dependent variable. Based on the preliminary analyses and subsequent tests using target profile in the mediation analysis, it was determined that target profile made no appreciable difference in the model and was therefore dropped. To address the research question, target profile had no bearing on priming effects in this experiment.

Results supported Hypothesis 1, in replication of Experiment 1 (see Table 2). Exposure to sexual media primes (sexual primes vs. control) led to increased attribution of sexual characteristics,  $p = .01$ . Strong sexual primes again did not differ from weak sexual primes in their influence on sexual characteristics ratings, which does not support Hypothesis 2,  $p = .77$ . Next, ratings of sexual characteristics positively predicted overall appeal, in support of Hypothesis 3,  $p < .0001$ . The indirect effect of sexual primes (vs. control) on overall appeal was significant,  $B = .07, SE B = .03, CI_{95} = .02 \text{ to } .12, p < .05$ .

#### DISCUSSION

The purpose of this study was to provide a conceptual replication of research showing that sexual depictions in media can bias our social judgments to reflect sex-related concepts. Previous studies have shown that priming sex in media will lead people to overestimate the sexual characteristics in another

**TABLE 2** Replication of Effect of Sexual Primes on Overall Appeal via Sexual Characteristics

Predictors	Regression coefficients		
	<i>B</i>	<i>SE B</i>	<i>p</i>
Predicting sexual characteristics			
Sexual primes vs. control	.09	.04	.01
Weak vs. strong sexual primes	.02	.06	.77
$R^2 = .03, F(2,213) = 3.26, p = .04$			
Predicting overall appeal			
Sexual primes vs. control	-.03	.04	.52
Weak vs. strong sexual primes	.08	.07	.28
Sexual characteristics	.78	.08	<.0001
$R^2 = .33, F(3,212) = 34.76, p < .0001$			

*Note.* Table 2 represents the hypothesis test for Experiment 2. Values are the result of a mediation analysis performed in the Indirect macro for SPSS. The indirect effect of sexual primes vs. control was significant,  $B = .07, SE B = .03, CI_{95} = .02$  to  $.12, p < .05$ . The indirect effect of weak vs. strong sexual primes was not significant,  $B = .01, SE B = .05, CI_{95} = -.09$  to  $.12, ns$ . Number of samples for bootstrapping = 1000.

individual. The present study replicates and expands on these findings to consider how cognitions, first impressions in this case, change as a result of the altered sexual perceptions (cf., Carpentier et al., 2007).

In this study, two experiments were used to test the hypothesis that, compared to a nonsexual prime, any media prime that contained sexual cues would result in higher ratings of sexual characteristics attributed to an unfamiliar target. In turn, these elevated ratings would explain how appealing the target seemed overall. Both experiments supported this hypothesis. Sexual characteristics played a significant role in predicting the overall appeal of the target. The sexual media prime indirectly affected ratings of appeal through its direct influence on perceptions of the target's sexual characteristics. These findings were robust across different presentations of the target via social networking profiles. In addition, the overall average rating of many of the measures in this study was at the midpoint of its respective scale—an indication that findings were not the product of ceiling or floor effects. Thus, compared to their mean values, elevated ratings truly indicated greater sexuality or positive appeal, as opposed to both mean and elevated values being at the lower or higher end of its scale.

This link between the elevated primed concept and general judgments is an important one. It indicates that sexual media priming effects are not limited to thoughts about sexuality. Rather, thoughts about sexuality bleed into other judgments, as the criteria used to make these judgments are altered by the presence of the prime. Therefore, not only might we think about others as sex objects (e.g., Hansen & Krygowski, 1994), but sexual qualities

might overshadow other characteristics, such as honesty, integrity, sense of humor, or reliability, when we are considering whether to start a relationship with another person. As this study finds, we might be influenced to judge people inappropriately even in contexts of professional networks. Recall that effects were observed for evaluations of targets represented by Facebook, LiveJournal, BlackBookSingles, and LinkedIn online profiles. This is a particularly troublesome finding when we consider the lack of information we might have when deciding whether to make an online connection with a new person.

The two experiments in this study also compared media primes that portrayed a strong degree versus a weaker degree of sex. This comparison is a novel contribution to the literature and was inspired by research examining the various types of sexual content in mass media. Many content analyses of this nature (e.g., Kunkel et al., 2007), and many studies that use the taxonomy of these analyses consider a scene's explicitness and emphasis on sex when determining if a scene is high or low in sexual content. The resulting scales of sexual content are then correlated with personality characteristics in efforts to quantify the extent to which sexual content is reflected in a person's attitudes and behaviors (e.g., Brown & L'Engle, 2009).

The present study found no differences in priming effects between the strong and weak sexual primes used in the experiments. Both primes contributed to the effects noted above. The rationale behind comparing the two sexual conditions was that the degree of sexuality depicted in media content might be a manipulation of priming intensity, such that strong sexual primes would yield stronger effects than weak sexual primes. However, it appears that both primes in this study successfully activated the concept of sex beyond its threshold, thus, strengthening the contribution of sexual characteristics in overall judgments of appeal.

These findings suggest that the threshold for triggering sexual concepts in media is low. Therefore, sexual cues do not need to be overly explicit, nor do they need to directly reference sexual intercourse in order to affect our thought processes when we are forming impressions of others. Granted, priming effects are temporary effects, increasing the accessibility of related concepts for a short time only (Higgins, 1996; Higgins et al., 1985; Srull & Wyer, 1979, 1980; see Dillman Carpentier, Roskos-Ewoldsen, & Roskos-Ewoldsen, 2008, for a recent test). However, if sexual depictions in media are as ubiquitous as the research has cited (e.g., Kunkel et al., 2007), then it is reasonable to assume that media help keep sexual concepts chronically accessible in memory, at the ready for easy triggering. If this is the case, then we might be equally worried about major and minor sexual depictions, insofar as both types of depictions encourage us to favor sexual criteria when making social judgments.

The similarity in effects of this study's major and minor sexual depictions also raises questions about the conceptualization and testing of priming



intensity. The current study did not test for vividness of mental imagery upon viewing the primes, nor did it contain a measure of how or when the concept of sexual intercourse was activated upon exposure to the prime. Although often used as a proxy, sexual characteristic ratings are not substitutes for more traditional tests of accessibility, such as reaction times in recognizing sex-related words as words (versus other words or non-word letter strings) in a lexical decision task. Both vividness and reaction time measures might be useful in determining if explicitness of a depiction is an appropriate expression of priming intensity. These preliminary findings, therefore, suggest a need to go beyond the body of studies examining priming intensity in terms of length or frequency. Rather, we might find new insights if we examine priming intensity with respect to vividness and concreteness of the represented concept.

Generalizations made from this study are limited in a few key ways. First, the sample consisted largely of undergraduates at two universities. Although the two different locations used helps forward the case for generalization, the relative homogeneity of these two samples makes it somewhat difficult to draw conclusions for groups of other ages, educational status, or cultural backgrounds. Second, the primes were restricted to advertisements in the periphery of an online activity. Putting the primes in the periphery as opposed to embedding the primes within the main media content (as in the case of a sex scene within a movie clip) would likely lessen the impact of the prime. It is also worth noting that participants were not expressly asked to attend to the advertisements. This omission of instruction was intended to help ensure that participants were not deliberating on, judging, arguing, or otherwise consciously processing the priming content. In other words, a more nonconscious processing state was desired, aligning with an interpretation of priming effects as nonconscious effects on implicit memory.

The current study did not assess participants' actual or perceived attention paid to the primes, and so this assumption of relatively nonconscious processing cannot be empirically supported in this case. Yet, this study found effects for both the strong and weak priming conditions. This finding suggests the primes were sufficient in triggering sexual thoughts. The minimum processing need was met to yield effects. Still, a difference between strong and weak conditions might appear if the strong condition were to feature the sexual depiction as a major part of the primary content with which the participant is engaged.

A third limitation regards the number of advertisements featured in the control condition, compared to the sexual prime conditions. Although unlikely, it is possible that participants' evaluations of the target were influenced by a combination of sexual cues and the mere presence of advertisements. For example, perhaps the idea of selling products or the idea of general consumption affected judgments. If this is true, then it is possible that pre-

senting fewer ads in the control condition might have influenced results in that condition.

More generally, the experiments in this study are subject to the familiar limitation of using a single stimulus to represent each condition. Although multiple advertisements were used within each of the strong and weak sexual priming conditions, only one version of each condition was tested in each of the two experiments. This single-version design limits the ability to isolate within the message the exact causes of the effects; it concurrently signals an opportunity for replication with a more diverse representation of conditions.

Finally, the evaluations of the ambiguous target are based on online profiles. Further tests are needed to see how we respond to primes when we are evaluating others in different venues. For example, we might act differently in face-to-face encounters or in social media when the target is introduced via a trusted member of our social network. In any case, there is no assumption being forwarded that these social judgment outcomes significantly predict other outcomes, such as engagement in risky sexual behavior.

Despite these limitations, this study contributes to the existing body of literature by providing a rigorous, systematic analysis of the priming effects of sexual media as we might encounter it in an online environment. In two experiments, this study corroborates previous evidence that priming sex changes how we evaluate others through the elevation of sexual judgment criteria, and it connects this work with the literature that strives to quantify sexual content in media. Revisiting network models of memory, future research would do well to explore the duration of these priming effects on various types of social judgments, as well as examine how priming intensity might be defined within the context of sexual depictions. Ultimately, it is worth examining the role of priming and the resulting accessibility of sexual concepts in memory when we consider the short-term and long-term effects of a sexual media diet.

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