

# How Women's Nonconscious Association of Sex with Submission Relates to Their Subjective Sexual Arousability and Ability to Reach Orgasm

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**Abstract** Common cultural stereotypes promote women's submission to men, especially within intimate heterosexual relationships. Mirroring these stereotypes, women possess nonconscious associations between sex and submission (Sanchez, Kiefer & Ybarra, 2006). Moreover, women's sex-submission associations predict greater reports of engagement in submissive sexual behavior (Sanchez et al., 2006). In the present research, we again found that women associate sex with submission at a nonconscious level. Study 1 showed that women's nonconscious sex-submission associations predict reduced subjective arousability. Study 2 further demonstrated that these associations predict impaired ability to reach orgasm among women. These findings suggest that sex-submission associations may adversely affect women's sexual functioning.

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Traditional gender-based roles differ in the amount of power they grant to men and women. For example, women are expected to be responsive and to cater to others' desires, whereas men are expected to be assertive and independent of others (Diekman & Eagly, 2000; Eagly & Mladinic, 1989; Rudman & Glick, 1999, 2001; Wood, Christensen, Hebl, & Rothgerber, 1997). Within the context of intimate heterosexual relationships, gender-based roles dictate sexual submissiveness for women and sexual agency for men (Tevlin & Lieblum, 1983). Women's sexuality is frequently depicted in terms of passivity and submission to men's desire (Jhally, 1995; Kilbourne, 2000a, b; MacKinnon, 1987; McCreary & Rhodes, 2001). Moreover, the submissive gender role prescribed for women has been theorized to contribute to women's sexual dysfunction (Muehlenhard & McCoy, 1991; Sanchez, Kiefer, & Ybarra, 2006; Schwartz & Rutter, 2000; Sprecher & McKinney, 1993; Tevlin & Lieblum, 1983). We propose that, because gender roles are ubiquitous, women learn to associate nonconsciously the sexual context with submission and passivity (Sanchez et al., 2006). Furthermore, we argue that these nonconscious associations of sex with submission can impair women's capacity for arousal and orgasm (Sanchez et al., 2006; Tevlin & Lieblum, 1983).

## Sexual Scripts that Dictate Women's Submission

Women's and men's traditional sexual roles differ in terms of power and control. The popular media often characterize heterosexual intimacy in terms of men's dominance over

women and women's submission to men (Dworkin, 1987; Jeffreys, 1990; Kitzinger, 1984; MacKinnon, 1987). For example, men's dominance and women's submission are common themes in romance novels (Modleski, 1990; Snitow, 1979) and in more mainstream literature (Millet, 1970; Zilbergeld, 1978). Sexual interactions portrayed in television soap operas frequently eroticize men's dominance (Lowry, Love, & Kirby, 1981), and magazines marketed to adolescent girls promote sexually passive roles for young women (Baker, 2005; Kim & Ward, 2004).

Gender role theorists (e.g., Blumstein & Schwarz, 1983; Schwartz & Rutter, 2000; Sprecher & McKinney, 1993) have argued that exposure to media and to societal expectations socializes heterosexual men to take on a more agentic sexual role than heterosexual women do: men are expected to initiate and direct sexual activities. Correspondingly, heterosexual women are socialized to take on a relatively submissive or passive role during sexual activities (Gagnon & Simon, 1973; Schwartz & Rutter, 2000; Tevlin & Leiblum, 1983). Moreover, women's sexual behavior frequently reflects these gendered sexual norms. For example, Martin (1996) found that young women often describe their initial sexual experiences as incidents that "just happened to them". Women's sexual compliance continues into adulthood: approximately 50% of adult women report that they have engaged in unwanted sexual acts (O'Sullivan & Allgeier, 1998). Women's exposure to, and adoption of, a submissive sexual role is of interest because it may entail costs for their sexual arousability and function (Sanchez et al., 2006; Tevlin & Leiblum, 1983).

### Gender Differences in Sexual Arousal and Function

Women frequently report higher levels of sexual dissatisfaction and dysfunction than do men (e.g., Frank, Anderson, & Rubenstein, 1978; Heiman & Verhulst, 1982; Morokoff, 1990). According to a recent survey of the U.S. population, 43% of women report some form of sexual dysfunction, ranging from lack of sexual arousal to an impaired ability to reach orgasm (Laumann, Paik, & Rosen, 1999), whereas only 30% of men report some form of sexual dysfunction. Twenty-six percent of young women (ages 18–26) report that they are unable to reach orgasm under any circumstances (Laumann et al., 1999).

Women's greater experience of sexual dysfunction cannot be explained solely by physiological differences between the sexes, as research has shown that men and women do not differ in their physiological capacity for sexual arousal and orgasm (Heiman & Verhulst, 1982). In fact, recent attempts to improve women's sexual function have successfully increased women's physiological arousal

ability but failed to produce corresponding increases in their subjective experiences of sexual arousal or overall sexual satisfaction (Harris, 2004). These findings are consistent with research that shows that women's physiological arousal rarely if ever predicts their subjective experience of arousal (Both, Spiering, Everaerd, & Laan, 2004; Heiman, 1977; Steinman, Winze, Sakheim, Barlow, & Mavissakalian, 1981).

The dissociation between women's physiological and subjective arousal suggests that psychological factors play a prominent role in women's subjective sexual functioning and satisfaction. Tevlin and Leiblum (1983), for example, have argued that women's adoption of a submissive sexual role reduces sexual agency, thereby undermining their sexual function. In support of that contention, women who report less sexual control, autonomy, and agency often show inhibited sexual functioning and satisfaction (Amaro, Raj, & Reed, 2001; Grauerholtz & Serpe, 1985; Haavilo-Mannila & Kontula, 1997; Hurlbert, 1991; Hurlbert, Apt, & Rabehl, 1993; Sanchez, Crocker, & Boike, 2005; Sanchez et al., 2006). Moreover, exposure to sexually agentic women appears to decrease the dissociation between women's physiological arousal and their subjective experience of arousal (Laan, Everaerd, van Bellen, & Hanewald, 1994).

### Nonconscious Sex-Submission Associations and Sexual Function

Exposure to cultural stereotypes and expectations often affects individuals' processing of stimuli, interpretations of others' behavior, and their own personal behavior without their conscious intention or awareness of this influence (see Bargh & Chartrand, 1999, for a review). For example, many people who disavow prejudice toward African Americans on self-report measures evidence negative nonconscious attitudes toward African Americans (see Nosek, Greenwald, & Banaji, 2005, for a review). Even members of negatively stereotyped groups often possess those stereotypes on a nonconscious level. For example, women frequently possess nonconscious stereotypes regarding women's math and science ability, their competence, and their agency (e.g., Nosek, Banaji, & Greenwald, 2002; Rudman & Kilianski, 2000).

In our previous research, we have demonstrated that many women nonconsciously associate sex with their gender-based stereotypic role of submission (Sanchez et al., 2006). We used a subliminal priming methodology to study women's nonconscious associations of sex with submission. In those studies, women completed a computer-based lexical decision task in which they categorized a

series of letter strings and submissive- and dominance-related words according to whether or not they constituted actual words. Unbeknownst to the participants, a sex-related or neutral word, i.e., a “prime”, was presented briefly before each letter string. The computer presentations of these primes were too fast to elicit conscious awareness but slow enough to influence women’s subsequent processing and speed of categorizing the letter strings, i.e., the primes were presented subliminally. Women’s responses to submissive words tended to be faster when preceded by sex primes than when preceded by neutral primes (i.e., they evidenced faster responses to word pairs such as bed–comply than to word pairs such as chalk–comply). This response facilitation suggests that the majority of women nonconsciously associate the sexual context with submission. Moreover, women’s nonconscious tendency to associate sex with submission predicted self-reported engagement in submissive sexual behavior. Thus, women’s nonconscious sex-submission associations seem to reflect a link between the sexual context and their personal submission (Sanchez et al., 2006, Study 3).

In the present research, we sought to extend these findings by investigating whether nonconscious sex-submission associations predict women’s subjective sexual experience, as indicated by their self-reported arousability and ability to reach orgasm. Evidence of a link between sex-submission associations and arousal would lend support to our contention that the cultural imprint of traditional gender roles undermines women’s subjective sexual arousability and sexual functioning.

For a number of reasons we decided to focus on women’s nonconscious, rather than their conscious, associations of sex with submission. First, assessment of nonconscious associations bypasses methodological concerns regarding self-reports of sexual preferences and behavior, such as socially desirable responses (e.g., Baumeister & Tice, 2000). Indeed, women’s reports of certain sexual behaviors, especially behaviors that are linked with strong gender-based norms, are affected by socially desirable responses (e.g., Alexander & Fisher, 2003). Second, even individuals who explicitly disavow cultural stereotypes and prejudices often possess them on a nonconscious level (e.g., Arkes & Tetlock, 2004; Greenwald & Banaji, 1995; Nosek et al., 2005). Hence women may associate the sexual context with submission without conscious intention or awareness, and thus be unable to report these associations accurately. Third, nonconscious associations may be particularly likely to influence sexual behaviors because these behaviors occur under heightened arousal. Arousal tends to reduce the influence of conscious thought on behavior and thereby heighten the influence of nonconscious information processing (Fazio & Towles-Schwen, 1999). Thus, nonconscious sex-submission associ-

ations may exert a strong influence on women’s subjective sexual behavior and experiences.

## Study 1

In *Study 1*, we examined the relationship between women’s nonconscious associations of sex with submission and their subjective perceptions of their ability to become aroused by different sexual activities. Women’s nonconscious associations of sex with submission, as well as their associations of sex with dominance, were assessed using a subliminal priming procedure embedded in a lexical decision task. Consistent with their gender specific sexual role, women were expected to associate sex with submission and not with dominance at a nonconscious level. In addition, women’s sex-submission and sex-dominance associations were expected to be negatively correlated, as many theories of the reciprocal relationship between submission and dominance would suggest (e.g., McCreary & Rhodes, 2001). Finally, women’s associations of sex with submission were expected to predict decreased subjective sexual arousability.

## Method

*Participants* Forty-eight female undergraduate students from the University of Michigan participated in the 1-h experimental session (38 European Americans, four African Americans, one Latina, three Asian Americans, and two participants of mixed racial backgrounds).<sup>1</sup> Participants were recruited from the undergraduate psychology subject pool and participated in exchange for credit toward fulfillment of a course requirement. Participants were asked about their sexual experience with the question: “Have you ever had sexual intercourse?” The sample was diverse in terms of sexual experience: 21 participants reported never having experienced sexual intercourse; 25 indicated that they had experienced sexual intercourse; and two participants declined to provide this information. A separate question asked participants about their sexual orientation. All participants indicated that they were heterosexual.

<sup>1</sup> Male participants were not included in the present manuscript because their sex-submission and sex-dominance links failed to predict their arousability. Furthermore, in the regression analyses the gender by sex-submission interaction was a significant predictor of subjective sexual arousability,  $\beta = -.345$ ,  $p = 0.001$ , in *Study 1* and of ability to reach orgasm,  $\beta = -.129$ ,  $p < 0.05$ , in *Study 2*. These statistical results justified our focus on the effects of these links on women.

**Materials** We used the set of stimulus words for categorization by the participant in the lexical decision task (targets) and words to be presented subliminally (primes) that were used in our previous research to measure nonconscious sex-submission and sex-dominance associations (Sanchez et al., 2006). The targets were selected based on a pretest in which a separate set of participants ( $N=20$ ) rated the strength of association of 90 words with submission and dominance on a 11-point rating scale that ranged from  $-5$  (highly associated with submission) to  $+5$  (highly associated with dominance). The strength of each word's association with sex was also rated on a six-point scale anchored at 0 (not at all associated with sexual intercourse) and  $+5$  (highly associated with sexual intercourse). We selected sex primes that were strongly associated with sex, but weakly associated with submission or dominance, and submissive (dominant) target words that were strongly associated with submission (dominance), but weakly associated with sex. This was done to ensure that we were testing associations between distinct concepts (Mussweiler & Förster, 2000). Thus, out of the initial pool of 90 words, the six sex-prime words selected were strongly associated with sex ( $M>2$ ) and relatively unassociated with submission or dominance ( $-1<M<1$ ): *sex*, *climax*, *oral*, *naked*, *caress*, and *bed*. The six dominance-related target words selected were weakly associated with sex ( $M<1$ ) and strongly associated with dominance ( $M>2$ ): *coerce*, *assert*, *power*, *fierce*, *strong*, and *challenge*. The six submission-related target words selected were weakly associated with sex ( $M<1$ ) and strongly associated with submission ( $M<-2$ ): *comply*, *submit*, *slave*, *yield*, *concede*, and *weaken*. Neutral primes were taken from Mussweiler and Förster (2000; *house*, *oven*, *table*), Bargh, Pryor, Raymond, and Strack (1995; *chalk*, *clock*), and the pretest (*brick*). A different set of neutral words was used as filler targets. Filler targets, as well as one neutral prime (*brick*), were selected based on the pretest to have a mean at the zero-point of the scale. Thus, neutral targets and the one neutral prime (*brick*) were unassociated with dominance/submission and with sexual intercourse. The neutral targets were *stroll*, *leap*, *bench*, *gate*, *wander*, and *building*.

Following the procedure used by Sanchez et al. (2006), a total of 56 prime-target pairs were constructed. The task contained a total of 66 trials: ten practice trials and 56 actual trials. Participants experienced six cycles of the prime-target pairs that were used to assess sex-submission and sex-dominance associations (i.e., sex prime-submissive target word, neutral prime-dominant target word, sex prime-dominant target word, neutral prime-dominant target word), and eight cycles of the filler prime-target pairs (sex prime-neutral target word, neutral prime-neutral target word, sex prime-nonword, neutral prime-nonword), which were presented in a predetermined randomized order.

The Sexual Arousability Index, which was developed and validated across four studies by Andersen, Broffitt, Karlsson, and Turnquist (1989), was used to assess sexual arousability. Participants rated how sexually arousing they found or would find various intimate activities. Following Anderson et al. (1989) the survey items described specific sexual situations (e.g., when your partner undresses you) that were rated on a seven-point scale anchored at 1 (adverse effect) and 7 (always causes sexual arousal). These anchor points were identical to those used by Anderson et al. (1989). To assess arousal for the individual subscales and to assess overall arousability, responses on items were averaged. The measure contains five subscales that assess arousability from various behaviors. These scales were reliable in the present research: seductive activities,  $\alpha=0.90$  (e.g., “when a loved one undresses you”); body caressing,  $\alpha=0.90$  (e.g., “when your partner fondles your breasts or chest with his/her hands”); oral-genital and genital stimulation,  $\alpha=0.87$  (e.g., “when your partner stimulates your genitals with his or her hands/fingers”); intercourse,  $\alpha=0.89$  (e.g., “when you have intercourse with your partner”); and erotica/masturbation,  $\alpha=0.89$  (e.g., “when you watch a pornographic movie”); overall  $\alpha=0.95$ .<sup>2</sup>

We also assessed participants' gender, sexual experience, and sexual orientation.

**Procedure** The experimental procedure was modeled after that used by Bargh et al. (1995). Up to 14 participants took part in each experimental session. Upon arrival, participants were greeted by a female experimenter and seated at computer terminals in separate cubicles. First, participants completed the lexical decision task using E-prime software while seated approximately 70 cm from the computer screen. For the lexical decision task, participants received oral instructions from the experimenter and written instructions on the computer screen. They were told to use different keys on the keyboard to classify letters as being either actual words or nonsense letter strings. They were further instructed to keep both hands on the keyboard at all times and to respond as quickly as possible without sacrificing accuracy.

At the beginning of each trial in the lexical decision task, a fixation point was presented in the center of the computer

<sup>2</sup> Our interest in sexual arousability was limited to arousal with partners; therefore we excluded arousal from erotica and pornography. Results are unchanged by the inclusion of arousal from erotica. However, the erotica subscale by itself was unrelated to sex-submissive associations,  $r(34)=-0.14$ . The divergence of women's responses to the erotic subscale from their responses on the other subscales may result from women's infrequent use of, and negative attitude toward, erotic material as a source of arousal (Fribley, Johnson, & Kellman, 1997; Leiblum, Rosen, Platt, & Cross, 1993).



screen. A sex or neutral word prime was then presented at the center of the screen (i.e., foveally) for 55 ms, an exposure too brief for conscious processing (Perdue, Dovidio, Gurtman, & Tyler, 1990; Perdue & Gurtman, 1990; Sanchez et al., 2006).<sup>3</sup> The prime was then masked for 10 ms. Next, a target word was presented in the center of the computer screen and remained in view until one of the designated response keys was pressed. A total of 66 trials (ten practice and 56 actual) were presented during the task. After the lexical decision task, participants were given a written that contained the sexuality items, demographic questions, and a suspicion probe. The suspicion probe asked participants about their awareness of the presence of primes during the lexical decision task and about what they believed to be the purpose of the study. Finally, participants were thoroughly debriefed, thanked, and given course credit for their participation.

## Results

Participants reported no awareness of the prime words nor of the overall purpose of the study; thus, no participants were excluded on these bases. One participant with an error rate (i.e., the percentage of trials in the lexical decision task on which the participant misclassified the target letter strings) greater than 20% was excluded from the analyses. The average error rate for the lexical decision task was 4.31% ( $SD=5.13\%$ ). Because of the low mean error rate on the lexical decision task, reaction times to target stimuli that the participant misclassified were included in the analyses. To prevent undue influence of outliers on the response time data, response latencies lower than 300 ms or greater than 3,000 ms were recorded as 300 ms and 3,000 ms, respectively (see Bargh & Chartrand, 2000). Of all the reaction times ( $N>2,000$ ) for all participants, only 36 reaction times were slower than 3,000 ms, and none were faster than 300 ms. These excessively slow reaction times ( $>3,000$  ms) were recoded as described above. Because reaction time data are often positively skewed (see Greenwald, Schwarz, & McGhee, 1998; Karpinski & Hilton, 2001), we also log-transformed the response time data.<sup>4</sup>

*Nonconscious associations* To examine nonconscious sex associations, we conducted a 2 (prime type: sex vs. neutral)  $\times$  2 (target type: dominance vs. submissive) repeated-measures ANOVA. The ANOVA revealed significant main effects for prime,  $F(1, 44)=6.95$ ,  $p=0.012$ , and target,  $F(1, 44)=48.48$ ,  $p<0.001$ . Overall participants were slower to respond to sex primed words ( $M=889.66$  ms;  $SD=345.30$ ) than to neutral primed words ( $M=842.31$  ms;  $SD=311.21$ ). In addition, participants were faster to respond to submissive target words ( $M=812.89$  ms;  $SD=334.34$ ) than to dominant target words ( $M=919.07$  ms;  $SD=332.63$ ). These main effects were qualified by the expected significant interaction of prime by target,  $F(1, 44)=39.37$ ,  $p<0.001$ .

To interpret the interaction, we compared response latencies of sex primed submissive words to the neutral primed submissive words (e.g., bed-comply versus chalk-comply) in a repeated measures ANOVA. Responses to the sex primed submissive words ( $M=749.23$  ms,  $SD=197.96$ ) were significantly faster than responses to neutral primed submissive words ( $M=841.76$  ms;  $SD=295.03$ ),  $F(1, 44)=16.83$ ,  $p<0.001$ . Thus, as in our previous studies (Sanchez et al., 2006), sex primes facilitated responses to submissive target words.

In contrast, responses to the dominant words primed with sex ( $M=1,004.48$  ms,  $SD=323.91$ ) were significantly slower than responses to dominant words primed with neutral words ( $M=839.94$  ms,  $SD=205.71$ ),  $F(1, 44)=45.12$ ,  $p<0.001$ . In other words, sex primes inhibited responses to dominant target words.

*Subjective sexual arousal* To explore the relationship between sex-submission associations and subjective sexual arousal, we created individual difference scores that indexed the extent to which sex-primes facilitated responses to submissive words and dominant words. To create sex-submission (dominance) association scores, we subtracted the mean logged latency for sex-primed submission (dominance) words from the mean logged latency for neutral-primed submission (dominance) words. Higher facilitation scores therefore indicate stronger sex-submission and sex-dominance associations. The sex-submission and sex-dominance facilitation scores were significantly negatively correlated,  $r(45)=-.49$ ,  $p<0.001$ .

To examine the effects of the sex-submission association and sex-dominance on sexual arousability, we regressed subjective sexual arousal on the sex-submission association and the sex-dominance association, after controlling for sexual experience,  $\beta=-.379$ ,  $p=0.001$ : women who had experienced sexual intercourse reported greater arousability. As predicted, the more women associated sex with submission, the less subjective arousability they reported,  $\beta=-.606$ ,  $p=0.001$ . The sex-dominance association failed to predict women's arousability,  $\beta=-0.201$ ,

<sup>3</sup> Previous research that used 55 ms foveal priming showed that participants failed to recognize prime words at a rate better than chance (Sanchez et al., 2006).

<sup>4</sup> Untransformed mean responses latencies are given for the purposes of illustration in both Study 1 and Study 2.

**Table 1** Means, standard deviations, and zero order correlations for measured variables.

	1.	2.	3.	4.
1. Sex-submission	1.00			
2. Sex-dominance	-0.490***	1.00		
3. Sexual arousability	-0.459**	0.133	1.00	
4. Sexual experience	-0.036	0.029	-0.285+	1.00
Mean	0.044	-0.073	5.29	1.45
Standard deviation	0.072	0.073	1.15	0.504

Note: Sexual experience was coded 1=never experienced sexual intercourse, 2=experienced sexual intercourse.

+ $p < 0.07$ , \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

$p > 0.2$ .<sup>5</sup> These results support our contention that sex-submission associations undermine women's sexual arousability. See Table 1 for means, standard deviations, and correlations between measured variables.

## Discussion

**Study 1** replicated previous findings on sex-submission associations (Sanchez et al., 2006) by demonstrating that women nonconsciously associated sex with submission and not with dominance. Unique to the present study, we found that women's association of sex with submission predicted lowered subjective sexual arousability from various sexual activities, which ranged from arousability during foreplay to arousability during intercourse. These findings are consistent with the idea that nonconscious associations of sex with submission reduce subjective sexual arousability in women. This association may further relate to women's self-reported ability to reach orgasm.

The causes of women's frequent reports of difficulty reaching orgasm are a source of scientific controversy. For example, in a recent study, researchers (Dunn, Cherkas, & Spector, 2005) compared identical and nonidentical female twins and found evidence for a genetic component for women's ability to reach orgasm. However, the heritability

<sup>5</sup> Sexual experience did not moderate these results. Furthermore, analyses were also performed for each arousal subscale. We regressed each subscale separately on sexual experience (whether or not they had experienced sexual intercourse), sex-submission associations, and sex-dominance associations. Findings were consistent. After controlling for sexual experience, sex-submission associations predicted lowered arousability for the caress subscale,  $\beta = -0.617$ ,  $p = 0.001$ , seductive activities subscale,  $\beta = -0.528$ ,  $p = 0.004$ , oral sex subscale,  $\beta = -0.538$ ,  $p = 0.003$ , and sexual intercourse subscale,  $\beta = -0.603$ ,  $p = 0.001$ . Sex-submission associations marginally predicted the erotica subscale,  $\beta = -0.374$ ,  $p = 0.06$ , *ns*. Sex-dominance associations failed to predict arousal for the caress subscale,  $\beta = -0.097$ ,  $p > 0.5$ , *ns*, seductive activities subscale,  $\beta = -0.197$ ,  $p > 0.2$ , *ns*, oral sex subscale,  $\beta = -0.239$ ,  $p > 0.1$ , *ns*, sexual intercourse subscale,  $\beta = -0.166$ ,  $p > 0.3$ , *ns*, and the erotica subscale,  $\beta = -0.283$ ,  $p > 0.1$ , *ns*.

estimates ranged from 34–45% of the variation in women's ability to reach orgasm, which suggests that sociocultural factors, such as women's socialization into submissive sexual roles may also play an important role in women's ability to reach orgasm. Furthermore, because the sex-submission association is linked with reduced arousability and because sexual arousal is considered a necessary precursor to orgasm (see Masters & Johnson, 1966), nonconscious sex-submission associations may predict impaired sexual functioning. To test this possibility, in **Study 2** we examined whether women's association of sex with submission similarly affects their ability to reach orgasm.

## Study 2

### Method

**Participants** One hundred and fifteen female undergraduate students from the University of Michigan participated in the 1-hour experimental session.<sup>1</sup> Participants were recruited from the undergraduate psychology subject pool and participated in exchange for course credit. Five participants either reported being bisexual, or lesbian, or declined to indicate their sexual orientation. Because this study was focused on the effects of women's gendered sexual roles in heterosexual relationships, data from these participants were excluded from subsequent analyses. To assess relationship status, participants were asked whether or not they were currently involved in a romantic relationship (1 = not currently in a romantic relationship, 2 = currently involved in a romantic relationship). The sample was diverse in terms of relationship status: 52% of our sample indicated that they were currently involved in a romantic relationship; 48% of the sample indicated that were not currently in a romantic relationship.

To assess sexual experience, participants were asked to respond 1 (yes), 2 (no), or 3 (I do not wish to answer) to the following question: "Have you had sexual intercourse?" The sample was diverse in terms of sexual experience: 62% of the sample indicated that they had experienced sexual intercourse; 35% indicated that they had never experienced sexual intercourse; the remaining 3% declined to provide this information.

**Materials** The materials for the lexical decision task were identical to those used in **Study 1**.

To assess overall ability to reach orgasm, participants rated the following two statements on a five-point scale anchored at 1 (Never: 0% of the time) and 5 (Always/Almost Always: 95% of the time or more): "How often do you reach orgasm during sexual activities?" and "How often do you orgasm with your partner?" Responses on

these two items were averaged together to create a reliable scale ( $\alpha=0.81$ ). Higher scores on this measure indicate greater ability to reach orgasm.

We also assessed participants' gender, relationship status, sexual experience, frequency of sexual intercourse, and sexual orientation.

**Procedure** The procedure was again modeled after Sanchez, et al. (2006). Up to 14 participants took part in each experimental session. Upon arrival, participants were greeted by a female experimenter and seated at computer terminals in separate cubicles. The procedure for the lexical decision task was identical to that used in Study 1. Following the lexical decision task, participants were given a written questionnaire that contained the orgasm measure, demographic questions, and a suspicion probe. The suspicion probe inquired about participants' awareness of the presence of primes during the lexical decision task and about what they believed to be the purpose of the study. Finally, participants were thoroughly debriefed, thanked, and given course credit for their participation.

## Results

Participants did not report any awareness of the prime words during the lexical decision task or any suspicion of the overall purpose of the study. No participants had error rates greater than 20% on the lexical decision task. Thus, no participants were excluded because of high error rates. The average error rate was 4.33% ( $SD=3.53\%$ ). Because of the low average error rate on the lexical decision task, reaction times on both correct and incorrect trials were included in the analyses. As in Study 1, responses below 300 ms or above 3,000 ms were recoded as 300 and 3,000 ms, respectively. Of all the reaction times ( $N>6,000$ ) for all participants, only three reactions times were lower than 300 ms, and 29 were greater than 3,000 ms, and, thus, were recoded as in Study 1. As in Study 1, response time data were log transformed.

**Nonconscious associations** To examine nonconscious sex associations, we conducted a 2 (prime type: sex vs. neutral)  $\times$  2 (target type: dominance vs. submissive) repeated measures ANOVA. The ANOVA revealed significant main effects for prime,  $F(1, 109)=172.29, p<0.001$ , and target,  $F(1, 109)=150.71, p<0.001$ . Participants were, on average, slower to respond to sex primed words ( $M=870.28$  ms;  $SD=282.94$ ) than to neutral primed words ( $M=822.03$  ms;  $SD=259.52$ ). In addition, participants were faster, on average, to respond to submissive target words ( $M=774.51$  ms;  $SD=245.65$ ) than to dominant target words ( $M=917.80$  ms;  $SD=302.60$ ). These main effects were

qualified by the expected significant interaction of prime by target,  $F(1, 109)=150.71, p<0.001$ .

To interpret the interaction, we compared response latencies of sex primed submissive words to the neutral primed submissive words (e.g., bed-comply versus chalk-comply) in a repeated-measures ANOVA. Responses to the sex primed submissive words ( $M=725.00$  ms,  $SD=224.10$ ) were significantly faster than responses to neutral primed submissive words ( $M=824.03$  ms;  $SD=293.41$ ),  $F(1, 109)=60.91, p<0.001$ . Thus, sex primes facilitated responses to submissive target words.

In contrast, responses to dominant words primed with sex ( $M=1,015.56$  ms,  $SD=376.37$ ) were significantly slower than responses to dominant words primed with neutral words ( $M=820.04$  ms,  $SD=254.61$ ),  $F(1, 109)=156.88, p<0.001$ . Thus, sex primes inhibited responses to dominant target words.

**Correlation between sex-submission and sex-dominance associations** To assess the correlation between sex-submission and sex-dominance associations, we again created individual difference scores as in Study 1. Higher scores indicate greater facilitation. As in Study 1, the sex-submission and dominance facilitation scores were significantly negatively correlated,  $r(109)=-0.391, p<0.001$ . As predicted, women's sex-submission facilitation score ( $M=0.0491$ ) was significantly greater than zero,  $t(109)=7.80, p<0.001$ , whereas women's dominance facilitation score ( $M=-0.0839$ ) was significantly less than zero,  $t(109)=-12.53, p<0.001$ , which indicates that women again nonconsciously associated sex with submission but not with dominance.

**Women's ability to reach orgasm** Twenty-nine participants did not complete the items that assessed ability to reach orgasm. Thus, in accordance with the principles set forth by Allison (2002), several logistic regressions were conducted to predict missing data. According to Allison (2002), variables that predict missing data should be included in the final analysis. Binary logistical regression was performed to determine which, if any, demographic variables predicted missing data. In these preliminary analyses, we included several demographic factors and facilitation scores to predict missing data: relationship status, sexual experience, sexual frequency, and submissive and dominance facilitation scores. Of these, only sexual experience,  $\beta=4.90, SE=1.06, p=0.007$ , significantly predicted missing data: women who had experienced sexual intercourse were significantly more likely to answer the orgasm question. In the following analysis, we therefore controlled for sexual experience.<sup>6</sup>

<sup>6</sup> Analyses were also performed without including sexual experience as a covariate. Results remained unchanged.

**Table 2** Means, standard deviations, and zero order correlations for measured variables.

	1.	2.	3.	4.	5.
1. Sex-submission	1.00				
2. Sex-dominance	-0.391***	1.00			
3. Ability to reach orgasm	-0.229*	0.008	1.00		
4. Relationship status	0.012	0.033	0.252*	1.00	
5. Sexual experience	0.060	-0.014	0.011	-0.337***	1.00
Mean	0.049	-0.083	3.29	1.52	1.36
Standard deviation	0.066	0.070	1.33	0.502	0.484

Note: Relationship status was coded 1=currently not in a relationship, 2=currently in a relationship; sexual experience was coded 1=experienced sexual intercourse, 2=never experienced sexual intercourse.

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

Although relationship status did not predict missing data, relationship status was believed to predict ability to reach orgasm because women engaged in ongoing relationships may have more sexual experience and may feel more comfortable with their partner(s). Thus, relationship status was also included as a control variable.<sup>7</sup>

We regressed orgasm ability on sexual experience (whether or not participants had experienced sexual intercourse), relationship status (whether or not they were currently in a romantic relationship), sex-submission associations, and sex-dominance associations.<sup>8</sup> As expected, women who were in a romantic relationship indicated greater ability to reach orgasm ( $N=79$ ),  $\beta=0.271$ ,  $p=0.02$ . Of greater interest, sex-submission associations predicted reduced ability to reach orgasm,  $\beta=-0.295$ ,  $p=0.02$ . Neither sex-dominance associations,  $\beta=-0.103$ ,  $p > 0.3$ , *ns*, nor sexual experience affected women's ability to reach orgasm,  $\beta=0.061$ ,  $p > 0.5$ , *ns*. These results support our contention that possessing a sex-submission association

undermines women's ability to reach orgasm.<sup>9</sup> See Table 2 for the means, standard deviations, and correlations among all measured variables.

## Discussion

Study 2 replicated previous research (Sanchez et al., 2006) and the findings from Study 1 by showing that women, on average, nonconsciously associate sex with submission but not with dominance. Women's general tendency to associate sex with submission therefore appears to be a robust, reliable phenomenon. Of greater interest, Study 2 showed that women's nonconscious tendency to associate sex with submission predicted a reduced ability to reach orgasm. This finding suggests that nonconsciously associating sex with submission may impair women's sexual functioning.

## General Discussion

Across two studies we showed that women nonconsciously tend to associate sex with submission but not with

<sup>7</sup> Although we only report the analyses after we controlled for sexual experience (whether or not participants had engaged in sexual intercourse) and relationship status, we also conducted several analyses with sexual frequency as an additional covariate. Participants who indicated having experienced sexual intercourse were asked to indicate sex frequency on a scale where (1)=less than once a month, (2)=1–2 times a week, (3) 3–4 times a week, and (4)=5 or more times a week. The average sexual frequency of sexually experienced participants in the current sample was approximately 2–3 times a week ( $M=2.03$ ,  $SD=0.97$ ). Sexual frequency predicted greater ability to reach orgasm,  $\beta=0.355$ ,  $p=0.009$ ; however, inclusion of sexual frequency in the analysis significantly increased missing data ( $N=19$ ), because participants who had never experienced sexual intercourse were unable to answer this question. Nevertheless, when we controlled for sexual frequency, submissive facilitation predicted diminished ability to orgasm.

<sup>8</sup> Neither relationship status nor sexual experience moderated the effect of submissive facilitation on orgasm ability.

<sup>9</sup> Because ability to reach orgasm and sexual arousability were self-reported and thus may have been influenced by socially desirable responses, we conducted a pilot study on the influence of socially desirable responses on these measures. Analyses were conducted on a separate data set in which we assessed heterosexual women's self-reports of sexual function as assessed in Studies 1 and 2 and their tendency to give socially desirable responses ( $N=298$ ; Sanchez et al., 2005). Correlational analyses were used to test whether reports of arousal difficulty and ability to reach orgasm were significantly related to social desirability responses as measured by the Crowne–Marlowe scale (1960). Social desirability was not significantly correlated with self-reports of ability to reach orgasm,  $r=0.049$ ,  $p=0.41$ , *ns*, nor with self-reports of difficulty becoming aroused,  $r=0.007$ ,  $p=0.90$ , *ns*.



dominance. These findings complement past research that showed that women possess a nonconscious sex–power association (see Zurbriggen, 2000). Our findings suggest that women’s association of sex with power in the previous research may reflect an association between sex and an absence or lack of power, i.e., an association between sex and submission. More important, we found that women’s sex–submission association predicted reduced subjective sexual arousability in *Study 1* and less self-reported ability to reach orgasm in *Study 2*. Thus, women’s nonconscious sex–submission associations are linked with women’s reports of both diminished arousability and impairment during a later stage in the sexual response cascade (Geer & Janssen, 2000; Masters & Johnson, 1966). These findings lend support to feminist theory that contends that traditional sexual roles that dictate women’s sexual submission undermine women’s sexual autonomy and agency and thereby impede sexual function (Tevlin & Leiblum, 1983).

We believe that women’s nonconscious sex–submission association likely reflects exposure to traditional gender-based sexual roles. Heterosexual intimacy is linked with specific gender roles: women are expected to be submissive sexual partners, whereas men are expected to be dominant sexual partners (Bernard, 1966; Blumstein & Schwarz, 1983; Gagnon & Simon, 1973; Safilios-Rothschild, 1977; Sprecher & McKinney, 1993; Tevlin & Leiblum, 1983). Moreover, our findings imply that some women internalize their gender-specific role at a nonconscious level. Thus, women may be unaware of how these roles influence their subjective sexual experiences. Because the ability to become sexually aroused and to reach orgasm are believed to be important predictors of sexual satisfaction for both men and women (Laumann et al., 1999), the sex–submission link may also predict reduced sexual satisfaction. Future researchers should therefore explore the extent to which sex–submission affects satisfaction with sexual experiences.

Women’s gender roles may not only dictate submission but also prescribe an absence of sexual agency and dominance. McCreary and Rhodes (2001), for example, contended that the relationship between submission and dominance is reciprocal. In support of their contention, *Studies 1* and *2* showed that the more women associated sex with submission, the less they associated sex with dominance. Despite the moderate negative correlation found between these associations, it was submission, not lack of dominance or agency, that predicted women’s reports of arousability and ability to reach orgasm. Thus, submission to others’ desires, rather than a lack of dominance, appears to be particularly problematic for women’s sexual function.

Feminists have argued that sexually submissive roles hinder women’s ability to develop healthy, satisfying sexual relationships (Sanchez et al., 2006; Tevlin & Leiblum, 1983). Specifically, Tevlin and Leiblum, (1983) have

theorized that women who follow submissive sexual scripts fear being perceived as too sexually assertive, have difficulty expressing their sexual desires, and focus predominantly on their partner’s arousal and orgasm to the neglect of their own. The present findings lend support to this theory by demonstrating that nonconscious associations of sex with submission predict reduced subjective arousability and ability to achieve orgasm among women. In addition, the results of the present research indicate that exposure to gender-based sexual roles may affect women’s sexual function without their conscious awareness or intention, which suggests that some women may enact submissive behavior without consciously choosing to do so.

Although we have focused on the role of socialization in women’s sexual submission, women’s sexual submission could also stem from biological differences between the sexes. For example, Baumeister, Cantanese, and Vohs (2001) have argued that women’s sex drive is “naturally” weaker than men’s, which results in women expressing less sexual agency than men. According to those authors, the costs of promiscuity were higher for women (e.g., pregnancy); thus, women evolved weaker sex drives than did men (but see Hrdy, 1999, for an opposing viewpoint). Although we acknowledge that women’s sexual submission might have biological underpinnings, we believe that gender role socialization enhances women’s nonconscious associations of sex with submission.

#### Limitations and Future Directions

This research represents an initial step toward understanding how gender roles influence heterosexual women’s sexuality. Nonetheless, we must note an important caveat to these results: the causal association between the sex–submission link and women’s sexual functioning was not directly tested in this research, as the present studies were correlational. Hence it remains an open question whether the sex–submission association causes women to experience reduced arousability and ability to reach orgasm, or whether women who are less orgasmic come to associate sex with submission. The latter interpretation of our results is plausible: women who experience an impaired ability to orgasm may learn to associate sex with submission because they engage in sexual activities primarily to please their partners, not themselves. However, the present studies and past research (e.g., Sanchez et al., 2006) have shown that the extent to which women nonconsciously associate sex with submission does not differ by sexual experience. If the latter explanation were correct, the extent to which women associate sex with submission should differ by sexual experience. Furthermore, research has shown that exposure

to sexually agentic women increases women's subjective experiences of arousal (Laan et al., 1994), which suggests that sexual submission causes reduced subjective arousal.

In addition, women who associate the sexual context with submission may suffer from an inability to communicate their sexual desires to their partners and to insist upon contraceptive use. This hypothesis is consistent with the finding that adolescent girls who endorse traditional notions of femininity engage in risky sexual practices that promote unwanted pregnancies (Tolman, 2002). Future researchers should, therefore, investigate other potential consequences of the submissive gender role for women's sexual behavior.

Finally, in the present research we did not examine the role of women's partners in their nonconscious associations and in their sexual arousability and ability to reach orgasm. Women's sexual partners likely play a key role in women's sexual behavior and function. Sexual partners who communicate openly and encourage women's sexual agency may reduce the negative impact of submissive sexual scripts on women's sexual behavior and function. Correspondingly, sexual partners who conform to masculine gender role norms and discourage sexual agency among women could exacerbate women's adoption of a submissive role and, thus, further undermine their sexual functioning. The influence of women's sexual partners is therefore an important direction for future research. It is noteworthy that the effects of women's sex-submission associations were detected without taking into account variability in their sexual partners' behavior. We believe this is a strong testament to the robust nature of these effects.

## Conclusions

The present findings suggest that women's internalization of a submissive sexual role diminishes their subjective arousability and ability to reach orgasm during sexual activities, possibly without conscious awareness. Women's internalization of traditional gender roles may help to explain why they tend to report less sexual satisfaction and more sexual dysfunction than do men (e.g., Dunn et al., 2005; Laumann et al., 1999). These effects may be particularly insidious because they operate at an unconscious level, which renders their influence difficult to recognize and override.

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