

# Ambivalent Affect and Sexual Response: The Impact of Co-Occurring Positive and Negative Emotions on Subjective and Physiological Sexual Responses to Erotic Stimuli

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**Abstract** This study aimed to clarify the role of positive, negative, and ambivalent (i.e., co-occurring positive and negative) affect in predicting subjective sexual arousal, sexual desire, and genital response. A total of 26 women and 19 men observed three erotic film excerpts and a film excerpt depicting a coercive sexual encounter. Genital responses were recorded throughout the study, and participants rated their mood and subjective sexual arousal and desire following each excerpt. Results showed that positive affect was strongly and positively related to subjective sexual response. Although negative affect was generally a poor predictor of subjective sexual arousal, for women, it was positively associated with genital response in some conditions. Ambivalent affect was consistently associated with relatively high levels of subjective sexual arousal and desire. Results point to the importance of recognizing the role of ambivalent or mixed emotional states when evaluating the relationship between affect and sexual response.

**Keywords** Sexual arousal · Sexual desire · Affect · Ambivalence · Vaginal photoplethysmography · Penile erection · Psychophysiology

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## Introduction

The topic of sexuality in Western culture is surrounded by social taboos, media glamorization, and political debate. At an individual level, sex is accompanied by the potential for interpersonal closeness and physical pleasure but also for emotional and physical health risks. Thus, for many individuals, sexuality is likely to be a source of mixed, or ambivalent,<sup>1</sup> emotions. For example, an individual may feel pleasure or interest when viewing erotic materials while also experiencing guilt about enjoying something that is considered a taboo by many. There is evidence that positive and negative emotions may independently impact sexual response, but little is known about how the co-occurrence of positive and negative affect might influence sexual arousal and desire. Can individuals experience mixed positive and negative emotions in a sexual context? Conversely, can individuals experience indifference (or an absence of both positive and negative emotions) in a sexual context? If so, how do ambivalent or indifferent emotional states influence sexual response?

## Affect and sexual response

Researchers have long been interested in the relationship between affect and subjective sexual response (i.e., self-reported sexual arousal and desire) as well as in the relationship between affect and genital response (i.e., physiological sexual arousal as measured by changes in penile circumference or rigidity in men and by vaginal pulse amplitude in women). Intuitively, one might predict that positive emotional states would facilitate sexual response, while negative

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<sup>1</sup> The term “ambivalent” is used in this article to reflect the co-occurrence of positive and negative affect during or shortly after exposure to emotion-inducing situations or stimuli.

emotions would inhibit sexual response. However, research on the topic of affect and sexual response has produced a more complicated picture.

#### *Positive affect and sexual response*

Several researchers have reported a positive correlation between positive emotions and sexual response in men. For example, Koukounas and McCabe (2001) found that, in men, positive emotions were significantly related to increases in both subjective sexual arousal and genital responses. Similarly, compared to a neutral control condition, positive mood inductions preceding the presentation of erotic stimuli have been associated with increased subjective and physiological sexual arousal in men (Mitchell, DiBartolo, Brown, & Barlow, 1998).

Other researchers have reported a less straightforward relationship between positive emotions and sexual response in men. In a study of men with and without sexual dysfunction, Rowland, Cooper, and Slob (1996) found, using a factor analysis, that positive emotion items (e.g., pleasant and interested) loaded with items that had a positive sexual connotation (e.g., sensual and passionate) and with sexual response items (e.g., general sexual arousal and wanting to make love), resulting in a “positive arousal” scale. Thus, the factor structure was suggestive of a relationship between positive affect and subjective sexual arousal and desire. Additionally, when the men in Rowland et al.’s study were presented with penile vibrotactile stimulation, the positive arousal scale was a significant positive predictor of genital response. However, positive arousal did not predict genital response to an erotic video in the absence of tactile stimulation. In another study (Nobre et al., 2004), men’s positive affect during exposure to erotic films was significantly related to their subjective sexual arousal. However, positive affect was related to genital response only when the men viewed a *mildly* arousing film but not when the men viewed a *highly* arousing film.

There have been fewer studies on the role of affect in women’s sexual arousal and desire. In one study, positive mood induction was not found to facilitate subjective arousal or genital sexual response in women (Laan, Everaerd, Van Berlo, & Rijs, 1995). In another study of women’s sexual response, positive affect co-occurred with higher subjective arousal but did not result in greater genital response (Laan, Everaerd, van Bellen, & Hanewald, 1994). However, in an earlier study, Heiman (1980) found that positive affect (e.g., interest and enjoyment) was positively related to both subjective sexual arousal and genital response in women.

Thus, although the evidence is mixed, there is some support for the idea that positive affect can facilitate subjective and genital sexual response in men and women; however,

the relationship seems to be clearer and more consistent for subjective sexual arousal than for genital response.

#### *Negative affect and sexual response*

Findings regarding the association between negative emotions and sexual response are similarly mixed. Some researchers have found that negative affect was unrelated to both subjective and genital arousal in men (e.g., Nobre et al., 2004). Others have found that negative affect was associated with decreased sexual arousal in men. Specifically, following a negative mood induction, men in Mitchell et al.’s (1998) study experienced a decrease in genital response, but the negative mood induction did not impact their subjective sexual arousal.

Still other researchers have found support for a positive relationship between negative emotions and sexual arousal in men. Specifically, several studies provide evidence for the idea that anxiety can facilitate genital arousal, at least in sexually functional individuals (for a review, see Cranston-Cuebas & Barlow, 1990). Koukounas and McCabe (2001) reported a significant positive correlation between anxiety and subjective sexual arousal and nonsignificant but positive correlations between sexual arousal (subjective and genital) and disgust and between sexual arousal and anger. Rowland et al. (1996) found no correlation between negative affect and subjective or genital arousal except in men diagnosed with both premature ejaculation and erectile disorders; within this highly specific group, negative affect correlated positively with subjective sexual arousal.

There is relatively convincing evidence for a relationship between negative affect and genital (but not subjective) arousal in women. In a meta-analysis of factors influencing female sexual arousal, Laan and Everaerd (1995) found that, when included in a multiple regression analysis, negative emotions (i.e., aversion and shame) were among the strongest *positive* predictors of genital responses in women; however, negative emotions did not predict subjective sexual arousal. Although Heiman (1980) found a nonsignificant relationship between genital response and several specific negative emotions (e.g., guilt and anxiety), there was a significant positive correlation between disgust and genital response to sexual fantasy. Similarly, although Laan, Everaerd, Van Aanhoud, and Rebel (1993) did not directly evaluate the relationship between negative affect and sexual response, their study provided some evidence that negative affect did not inhibit women’s genital response. Laan et al. asked women either to watch an erotic film segment or to fantasize about an erotic situation. Women in the film condition reported more negative affect (i.e., aversion and shame) but at the same time exhibited stronger genital response than the women in the fantasy condition.

Thus, there is some evidence that increases in negative affect are associated with increases in genital sexual response for women. There is no clear evidence of a relationship between negative affect and subjective sexual response in women. Further, research shows a more variable relationship between negative affect and sexual response in men.

Notably, past studies of emotion and sexual response have focused almost exclusively on the relationship between affect and subjective and genital sexual arousal, leaving the relationship between affect and desire largely unexplored. Desire and arousal tend to be highly correlated with each other (e.g., Rosen et al., 2000; Rowland et al., 1996), and it has been theorized that desire may represent the cognitive awareness of sexual arousal (Everaerd & Both, 2001). Therefore, emotional states would likely impact desire in much the same way that they impact arousal, although research is needed to confirm this assumption.

To summarize, there is some support for the idea that positive affect is associated with greater sexual response in both men and women. Additionally, for women, negative affect actually may facilitate genital arousal but not subjective arousal. For men, negative affect does not appear to relate to sexual response in a clear and consistent manner. In general, the findings regarding affect and sexual response are complicated and inconsistent across studies. One possible explanation for the inconsistent findings regarding the relationship between affect and sexual response could involve ambivalent emotions or the co-occurrence of positive and negative affect.

Many of the studies cited above measured both positive and negative affect, which implies the possibility of co-occurring positive and negative emotions. However, these researchers generally analyzed the effects of positive and negative affect separately. Thus, the role of ambivalent or mixed emotions was not explicitly analyzed or discussed in any of these studies. If individuals can experience both positive and negative emotions in response to erotic stimuli, understanding the role of these co-occurring emotional states could contribute to our understanding of the complex relationship between affect and sexual response.

#### Ambivalent affect

Although emotion theorists continue to debate whether positive and negative emotions can co-occur (see e.g., Russell & Carroll, 1999), research suggests that individuals do experience ambivalent or mixed emotions. For example, Schimmack (2005) found that when participants rated their emotional state on unipolar scales, they reported co-occurring feelings of pleasure and displeasure. Further, it has been demonstrated that in particular situations (i.e., after watching a bittersweet movie, while moving out of college dormitories, and when graduating from college), men and

women report co-occurring feelings of happiness and sadness (Larson, McGraw, & Cacioppo, 2001).

#### *The structure of affect*

Several models have been proposed to explain how semantically opposite emotions (e.g., happy and sad) can co-occur. Some researchers and theorists have suggested and provided evidence for a structure of affect in which positive and negative affect serve as basic underlying dimensions (e.g., Cacioppo, Gardner, & Berntson, 1999; Diener & Iran-Nejad, 1986; Reich, Zautra, & Davis, 2003; Watson, Wiese, Vaidya, & Tellegen, 1999). Each of these two dimensions is identified by a variety of affective markers, which tend to cluster together (e.g., sad and guilty as markers for negative affect; pleasant and happy as markers for positive affect; Diener & Iran-Nejad, 1986; Watson et al., 1999). Although these markers may be distinct at lower levels of abstraction, at higher levels, their shared variance can be accounted for by a general positive or negative affective dimension (Cacioppo et al., 1999).

According to some recent theories (e.g., Watson et al., 1999), these basic positive and negative affective clusters reflect two distinct dimensions, rather than a single bipolar dimension. In this view, any given stimulus potentially can activate positive affect, negative affect, both, or neither. If a stimulus activates both positive and negative affect, an individual experiences ambivalence. If a stimulus activates neither positive nor negative affect, the individual experiences indifference (Cacioppo et al., 1999). Although it is possible for positive and negative affect to co-occur, most theorists emphasize that positive and negative affective dimensions are not entirely independent of each other. For example, it has been argued that, while positive and negative affect can co-occur at mild and moderate levels of intensity, intense negative affect is consistently associated with low levels of positive affect (Diener & Iran-Nejad, 1986; Reich et al., 2003).

#### Sexual stimuli as potential triggers of ambivalent affect

Although research suggests that positive and negative affect can co-occur in certain situations, most commonly-encountered stimuli tend to elicit positive *or* negative emotions, not both (e.g., Larsen et al., 2001; Scollon, Diener, Oishi, & Biswas-Diener, 2005). However, there is reason to believe that sexual situations may be especially likely to elicit ambivalent emotions (cf. Janssen, Everaerd, Spiering, & Janssen, 2000). For example, in a study of sexual decision-making in college students, over 80% of participants reported a situation in which they experienced a subjective sense of uncertainty or ambivalence about engaging in a sexual activity (O'Sullivan & Gaines, 1998). Similarly, Peterson and

Muehlenhard (in press) found that, when recalling a sexual situation, most college women reported that at the time they engaged in sex, they had both reasons for wanting to have sex and reasons for not wanting to have sex. Although Peterson and Muehlenhard focused on cognitive ambivalence (i.e., co-occurring positive and negative thoughts) rather than emotional ambivalence (i.e., co-occurring positive and negative feelings), it is likely that the cognitive ambivalence they found in their study corresponded to emotional ambivalence.

If sexual situations do invoke co-occurring positive and negative emotions, then research that is conducted from the implicit or explicit assumption that positive and negative emotions are mutually exclusive is prone to result in inconsistent or unclear findings. Although no study to our knowledge has explicitly evaluated the impact of mixed or ambivalent emotions on sexual arousal or desire, some inferences can be drawn from research using erotic films as stimuli. In one study (Mosher & MacLan, 1994), women who viewed erotic films intended for male audiences reported predominantly negative emotions in response to the stimuli; in contrast, women who viewed erotic films intended for female audiences reported ambivalent emotions (e.g., as a group, they reported moderately high levels of both disgust and joy) along with relatively high levels of subjective sexual arousal.

In their sample of men, Koukounas and McCabe (2001) found positive correlations between positive and negative affect in response to erotic film segments, suggesting that the erotic stimuli produced mixed emotions in many of the men. Additionally, positive and negative emotions were both positively (although not always significantly) correlated with sexual arousal.

Finally, Rowland, Tai, and Slob (2003) found that, after being treated with clomipramine, men with premature ejaculation experienced an increase in positive emotions and in feelings of sexual arousal and sensuality in response to sexual stimulation (i.e., erotic video and vibrotactile stimulation). However, the clomipramine treatment did not result in a concomitant decrease in negative emotions, suggesting that positive and negative emotions are two distinct dimensions and that the positive emotion dimension is more closely tied to sexual response than the negative dimension.

Thus, there is some evidence to suggest that erotic stimuli can elicit mixed or ambivalent emotional states. Further, these findings imply that ambivalent affect is not incompatible with sexual arousal. In light of several of the findings presented above, which suggest that negative affect *alone* does not significantly inhibit sexual response, it may not be surprising that *co-occurring* positive and negative emotions also are not necessarily incongruent with sexual response.

Although the study did not specifically focus on ambivalent emotions, Heiman (1980) speculated based on research results that “negative emotions . . . can coexist with sexual arousal, but positive emotional conditions must also

be present in order for sexual arousal to be maintained” (p. 1315). Following this reasoning, when ambivalent affect occurs in response to erotic stimuli, positive emotions may serve as a buffer for any potentially inhibiting effects of co-occurring negative emotions; thus, positive and negative emotions together may be associated with at least as much arousal as positive emotions alone.

### The present study

The present study builds on prior findings on the relationship between affect and sexual response by considering the role that ambivalent affect, or co-occurring positive and negative affect, plays in the prediction of subjective arousal, sexual desire, and genital response in both men and women. For this study, all participants viewed erotic film excerpts previously identified as particularly arousing to women, erotic excerpts previously identified as particularly arousing to men, and a film excerpt depicting a coercive and threatening sexual situation. These multiple conditions were chosen to maximize the likelihood that both men and women would experience mixed or ambivalent emotional responses during their participation in the study.

Two primary research questions were explored in this study:

1. Are emotional responses to sexual stimuli purely positive or negative or do some individuals respond to sexual stimuli with ambivalent affect (i.e., co-occurring positive and negative emotions) or indifferent affect (i.e., an absence of both positive and negative emotions)?
2. If there is evidence for ambivalence and indifference, how do positive, negative, ambivalent, or indifferent emotional states differentially impact subjective sexual arousal, sexual desire, and genital response?

## Method

### Participants

Participants were recruited based on their previous participation in a large questionnaire study.<sup>2</sup> In total, 26 women ( $M$  age = 20.3 years,  $SD$  = 2.8, range = 18–32) and 19 men ( $M$  age = 20.7 years,  $SD$  = 4.3, range = 18–36) took part.

<sup>2</sup> Potential participants were selected based on their scores on the SIS/SES questionnaire (Janssen, Vorst, Finn, & Bancroft, 2002), a trait measure of sexual inhibition-excitation proneness, in an attempt to achieve a sample with a range of scores on that questionnaire. Although the present study did not focus on these trait variables, a comparison of our sample with previous samples of male and female college students (e.g., Carpenter, Janssen, Graham, Vorst, & Wicherts, 2005; Janssen et al., 2002) revealed comparable ranges and averages of SIS/SES scores.

The sample was predominantly White (90%) and heterosexual (88%). Women and men did not differ significantly in terms of age, ethnicity, sexual orientation, or years of education. All participants were students at a large Midwestern university. Participants received \$25 for their participation. Approval for the study was obtained from the university's Human Subjects Committee.

## Measures

### *Film excerpts*

The participants were presented with four sexual film excerpts, each of which was three minutes long. The first two excerpts were segments selected from adult erotic films. In a previous study (Janssen, Carpenter, & Graham, 2003), one of these film excerpts was selected from among many excerpts as the most sexually arousing to female viewers (i.e., the "female-selected film") and the other film segment was selected as the most sexually arousing to male viewers (i.e., the "male-selected film"). In the present study, the order of the female- and male-selected excerpts was counterbalanced. For all participants, the third film excerpt was a segment from the commercially available movie, *A Reason to Believe*, which depicted a threatening or coercive erotic encounter. This film always followed the male- and female-selected films so that any discomfort associated with viewing the coercive clip would not influence participants' responses to the first two erotic clips. The fourth film excerpt differed for male and female participants: For male participants, the fourth film was the second most popular adult erotic film excerpt among men in Janssen et al.'s (2003) study. For female participants, the fourth film excerpt was the third most popular film excerpt among women in Janssen et al.'s study because the male-selected film was the second most popular among women. Hereafter, we refer to the fourth film clip as the "runner-up" film. This film was included so that we could better assess the impact of order effects (i.e., to what extent did viewing the coercive film influence participants' response to the runner-up film). Before the first erotic film excerpt and between each of the four experimental film excerpts, participants viewed 10-minute segments of a neutral video (a documentary on cats) in order to provide them with a return-to-baseline interval.

### *Subjective measures*

Following each erotic film excerpt, participants were asked to think about how they felt during the film and to rate a variety of emotional terms on a scale from 1 (*Not at all*) to 7 (*Very strong*). We asked participants to rate their positive and negative affective state using 11 emotional terms: interested, ashamed, angry, repulsed, sad, sensual, anxious, contemp-

tuous, pleasant, passionate, and guilty (adapted from Izard, 1972, following Laan et al., 1993, 1994). For the purposes of this study, four of these emotions (interested, sensual, pleasant, and passionate) served as markers for a positive affect and seven (ashamed, angry, repulsed, sad, anxious, contemptuous, and guilty) were used as markers for a negative state.<sup>3</sup> Because these individual emotion terms were viewed to represent underlying positive or negative affective dimensions (as per Watson et al., 1999), we calculated a "positive affect" score based on each participant's maximum score on one of the four positive emotion items and a "negative affect" score based on each participant's maximum score on one of the seven negative emotion items. Maximum ratings were considered preferable to mean ratings of positive and negative emotion items, as means might not accurately reflect the intensity of a positive or negative emotional state. For example, if a participant was very angry but did not endorse other negative emotions, the participant's mean score would be relatively low despite the presence of a strong (but specific) negative emotional state.

In addition to these 11 emotions, participants rated their overall level of sexual arousal during the film clip and the degree to which they experienced sexual desire, also on 7-point Likert scales. The sexual arousal and desire items were embedded within the list of emotion items. Ratings on these items served as measurements of subjective sexual arousal and desire.

### *Genital response measures*

In women, genital responses were measured using a photometric device (Sintchak & Geer, 1975). This device is made of clear acrylic plastic and shaped like a menstrual tampon. The photoplethysmograph contains a light-emitting diode and a photo transistor as a light detector. Changes in blood volume within the vaginal tissue were recorded as changes in the output of the light detector. The AC signal was taken as a measure of vaginal pulse amplitude (VPA). The AC signal was high-pass filtered (3 Hz) and digitized (40 Hz) using a Contact Precision Instruments (CPI) system and an IBM-compatible computer. Depth of the probe and orientation of the light emitting diode was pre-determined by a small acrylic plate attached to the photoplethysmograph (Laan, Everaerd, & Evers, 1995). Both the photoplethysmograph and the placement device were sterilized in a solution

<sup>3</sup> Although these individual emotions may not consistently reflect the underlying state, or expected valence, specified by the authors (e.g., "interested" or "sensual" may not always be experienced as positive), support for our identification of these emotions as positive or negative comes from the relatively strong bivariate correlations within the sets of items (e.g., "interested" and "sensual" were both correlated with "pleasant" across film conditions, with  $r$ 's ranging from .28 to .78 and from .71 to .81 respectively).

of Cidex activated glutaraldehyde between uses (Janssen, Prause, & Geer, *in press*). VPA was recorded and digitized continuously during baseline and stimulus conditions. The CPI PSYLAB software enabled off-line visual inspection of the VPA signal, and after removal of movement artifacts, the calculation of peak-to-trough amplitude for each pulse. For the analyses presented here, women's genital response for each film clip was based on the mean increase in VPA during the film from the initial baseline reading.

For men, genital responses were measured using a RigiScan device (Timm Medical Technologies; for a discussion of its validity and reliability, see Janssen, Prause, & Geer, *in press*). This computerized system measured penile circumference at 15-second intervals, and by means of controlled compression of the penile shaft, rigidity at 30-second intervals once circumference had increased by 20%. For the analyses presented here, genital response for each film condition is reported in terms of mean penile rigidity measured at the base of the penis.

### Procedure

Participants were tested individually. Upon arrival to the lab, they entered a room furnished with a recliner, desk, and television monitor. Male participants were assigned to a male experimenter and female participants to a female experimenter. The experimenter explained the procedures and assured the participant of the opportunity to withdraw at any time. After the participant read and signed an informed consent statement, the experimenter left the room and the participant put the genital response measurement device in place as instructed, and placed a disposable sheet and towel over his or her lap. Following this, participants began a 15-minute adaptation period. During this adaptation period, the participants viewed a neutral film excerpt. After the adaptation period, participants viewed the female- and male-selected films, in counterbalanced order, followed by the coercive and runner-up films. Each film condition was followed by completion of the subjective measures. Between the presentations of each film, a 10-minute neutral film clip was shown to establish return-to-baseline levels. At the end of the testing session, payment arrangements were made, and participants were questioned about their experiences and debriefed regarding the purpose of the study.

## Results

### Sexual and affective responses

To evaluate the effects of the various film conditions on our primary variables of interest, we performed separate 2 (Gender)  $\times$  2 (Film Order: male-selected first, female-selected first)  $\times$  4 (Film Condition) mixed factor ANOVAs,

with Film Condition as a within-subject factor and Gender and Film Order as between-subject factors. Greenhouse-Geisser corrected values are presented for all results involving within-subject factors. Descriptive statistics for these analyses can be found in Table 1.

### Positive affect

The ANOVA with positive affect as the dependent variable revealed a significant main effect of Film Condition,  $F(3, 123) = 22.03, p < .001$ . Follow-up tests showed that the coercive film condition was associated with significantly less positive affect than the three non-threatening erotic film conditions (i.e., the female-selected, male-selected, and runner-up conditions; all  $ps < .001$ ). There were no significant differences in positive affect among the three non-threatening erotic films. We also found a significant main effect of Gender,  $F(1, 41) = 8.84, p < .01$ , with men reporting more positive affect than women across all four film conditions (although this difference was not significant in the coercive film condition). No other significant main or interaction effects were found.

### Negative affect

For the ANOVA on negative affect, we also found a significant main effect of Film Condition,  $F(3, 123) = 24.18, p < .001$ . Follow-up tests showed that the coercive film condition resulted in significantly more negative affect than the three non-threatening erotic film conditions (all  $ps < .001$ ). There were no significant differences in negative affect among the three non-threatening erotic films. Although there was no main effect of Gender, the Film Condition  $\times$  Gender interaction effect was significant,  $F(3, 123) = 7.13, p = .001$ . Follow-up tests showed that women reported more negative affect than men only during the coercive film condition ( $p < .01$ ); in the other film conditions, there were no significant gender differences in negative affect. No other significant effects were found.

### Subjective sexual arousal

For the ANOVA with subjective sexual arousal as the dependent variable, there was a main effect for Film Condition,  $F(3, 123) = 29.25, p < .001$ , with participants reporting significantly less arousal after viewing the coercive film than after viewing the three non-threatening erotic film conditions (all  $ps < .001$ ). There was also a significant main effect of Gender,  $F(1, 41) = 17.70, p < .001$ , with men reporting significantly more subjective arousal than women across film conditions. There was no significant main effect of Film Order. We did find a significant Film Condition  $\times$  Film Order interaction,  $F(3, 123) = 3.99, p < .05$ . In post-hoc tests, we

**Table 1** Descriptive statistics for affect and sexual response as a function of gender and film condition

	Women		Men		<i>t</i>	<i>df</i>	Effect size <sup>d</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Female-selected film							
Positive affect <sup>a,b</sup>	3.94	1.50	5.26	1.24	-3.13**	43	0.86
Negative affect <sup>a,b</sup>	2.75	1.75	3.32	1.67	-1.09	43	0.33
Sexual arousal <sup>a</sup>	3.50	1.26	4.97	1.48	-3.60***	43	0.96
Sexual desire <sup>a</sup>	3.08	1.70	5.21	1.62	-4.25***	43	1.09
Genital response <sup>c</sup>	44.92	24.32	27.07	18.40	-	-	-
Male-selected film							
Positive affect <sup>a,b</sup>	4.04	1.93	5.53	1.22	-2.96**	43	0.82
Negative affect <sup>a,b</sup>	2.87	1.66	3.11	1.97	-0.44	43	0.13
Sexual arousal <sup>a</sup>	3.85	1.53	5.37	1.30	-3.50**	43	0.94
Sexual desire <sup>a</sup>	3.65	1.84	5.68	1.53	-3.92***	43	1.03
Genital response <sup>c</sup>	48.01	27.63	26.75	20.19	-	-	-
Coercive film							
Positive affect <sup>a,b</sup>	2.98	1.71	3.58	1.84	-1.12	43	0.34
Negative affect <sup>a,b</sup>	5.71	1.22	4.26	1.94	3.07**	43	0.85
Sexual arousal <sup>a</sup>	2.19	1.27	3.32	1.99	-2.31*	43	0.69
Sexual desire <sup>a</sup>	2.12	1.70	2.63	2.11	-0.91	43	0.27
Genital response <sup>c</sup>	37.00	23.35	13.89	17.42	-	-	-
Runner-up film							
Positive affect <sup>a,b</sup>	3.70	1.86	5.42	1.57	-3.27**	43	0.89
Negative affect <sup>a,b</sup>	2.85	2.04	3.68	2.08	-1.35	43	0.40
Sexual arousal <sup>a</sup>	3.33	1.44	5.24	1.55	-4.27***	43	1.09
Sexual desire <sup>a</sup>	3.23	1.98	5.58	1.80	-4.07***	43	1.06
Genital response <sup>c</sup>	47.40	26.00	27.26	18.21	-	-	-

<sup>a</sup> Absolute range, 1–7.

<sup>b</sup> Positive affect and negative affect scores were based on each participant's maximum score on the sets of positive and negative emotion items.

<sup>c</sup> Analyses of gender difference were not conducted on measures of genital response.

<sup>d</sup> Effect size =  $(M_1 - M_2) / SD_{\text{pooled}}$ .

For tests of gender difference, \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

found that participants who viewed the female-selected film first, reported greater sexual arousal in response to the male-selected than the female-selected film,  $t(21) = 2.66$ ,  $p < .05$ , and participants who viewed the female-selected film first, reported greater sexual arousal in response to the male selected than in response to the runner-up film,  $t(21) = 2.71$ ,  $p < .05$ ; these differences were not significant for participants who viewed the male-selected film first. No other significant effects were found.

### Sexual desire

For the ANOVA on sexual desire, we again found a significant main effect of Film Condition,  $F(3, 123) = 29.95$ ,  $p < .001$ , with participants reporting significantly less sexual desire after viewing the coercive film than after viewing the three non-threatening erotic film conditions (all  $ps < .001$ ). Participants also reported more desire in response to the male-selected film than in response to the female-selected film,  $t(44) = -2.73$ ,  $p < .01$ . There were no other differences among the three non-threatening erotic films. We also

found a significant main effect of Gender,  $F(1, 41) = 16.22$ ,  $p < .001$ , and a significant Film Condition  $\times$  Gender interaction,  $F(3, 123) = 4.93$ ,  $p < .01$ , with men reporting significantly more desire than women in every film condition except the coercive condition ( $ps < .001$ ). None of the other main or interaction effects were significant.

### Genital response

Because different instruments were used to assess genital responses in men and women, prohibiting any direct comparisons, separate ANOVAs were conducted for women and men. For women, we found a significant effect of Film Condition,  $F(3, 69) = 5.98$ ,  $p < .01$ , and follow-up tests revealed that the coercive condition elicited significantly lower genital responses than each of the other three erotic film conditions (all  $ps < .05$ ). There were no significant differences among the three non-threatening erotic films. No other main or interaction effects were found.

For men's genital responses, we also found a significant main effect of Film Condition,  $F(3, 45) = 4.52$ ,  $p = .01$ . Men

showed significantly less genital arousal to the coercive condition as compared to each of the three non-threatening erotic conditions (all  $p$ s < .05). There were no differences among the three non-threatening erotic films, and no other significant effects were found.

#### Presence of ambivalent affect

To address our first research question, we assessed the degree to which the stimuli induced mixed or ambivalent emotional states, we first calculated the percentage of men and women who reported at least some combination of positive and negative affect (i.e., maximum positive and negative ratings were both greater than 1). The majority of participants reported some co-occurring positive and negative emotions following presentation of the erotic stimuli. Specifically, in all four film conditions, the majority of women (62–80%, depending on condition) and the majority of men (63–73%) experienced some degree of ambivalence. There were no significant differences between men and women in these rates. In addition to the mere presence of co-occurring positive and negative affect, several individuals reported relatively *high* levels of both positive and negative emotions. Figure 1 illustrates the distribution of positive and negative affect scores for each of the four films. Thus, in all four film conditions, some women (8–27%) and some men (21–32%) provided ratings of positive and negative affect that were greater than the medians.

#### The relationship between affect and sexual response

To address our second research question, we explored the impact of positive, negative, and ambivalent emotions on sexual response. To this end, we conducted multiple regression analyses with subjective sexual arousal, sexual desire, and genital response as criterion variables. Predictor variables for each regression were gender (dummy-coded and entered in Step 1),<sup>4</sup> positive and negative affect (entered in Step 2), and the interaction between positive and negative affect (entered in Step 3). The interaction between positive and negative affect was included to evaluate more explicitly the role of ambivalent and indifferent emotional states in predicting sexual response. For these regression analyses, centered scores of positive affect, negative affect, and their interaction were used (Aiken & West, 1991).<sup>5</sup> Bivari-

ate correlations between criterion and predictor variables are presented in Table 2.

#### Predictors of subjective sexual arousal

Results for all significant regression analyses with subjective sexual arousal as the criterion variable are summarized in Table 3. For both the female-selected and the male-selected erotic film conditions, gender was a significant predictor of subjective sexual arousal ( $R^2 = .23$ ,  $p = .001$ ;  $R^2 = .22$ ,  $p = .001$ , respectively) with men reporting higher levels of arousal than women in both conditions. In the second step of the regression, the linear combination of gender and positive and negative affect accounted for a significant amount of variance in participants' subjective arousal for both films ( $R^2 \Delta = .30$ ,  $p < .001$  for the female-selected film, and  $R^2 \Delta = .36$ ,  $p < .001$  for the male-selected film). After controlling for gender, positive affect but not negative affect proved to be an independent and significant predictor of subjective arousal in both film conditions (see Table 3). The third step of the regression analysis, which introduced the interaction between negative and positive affect, did not reach significance for either film condition.

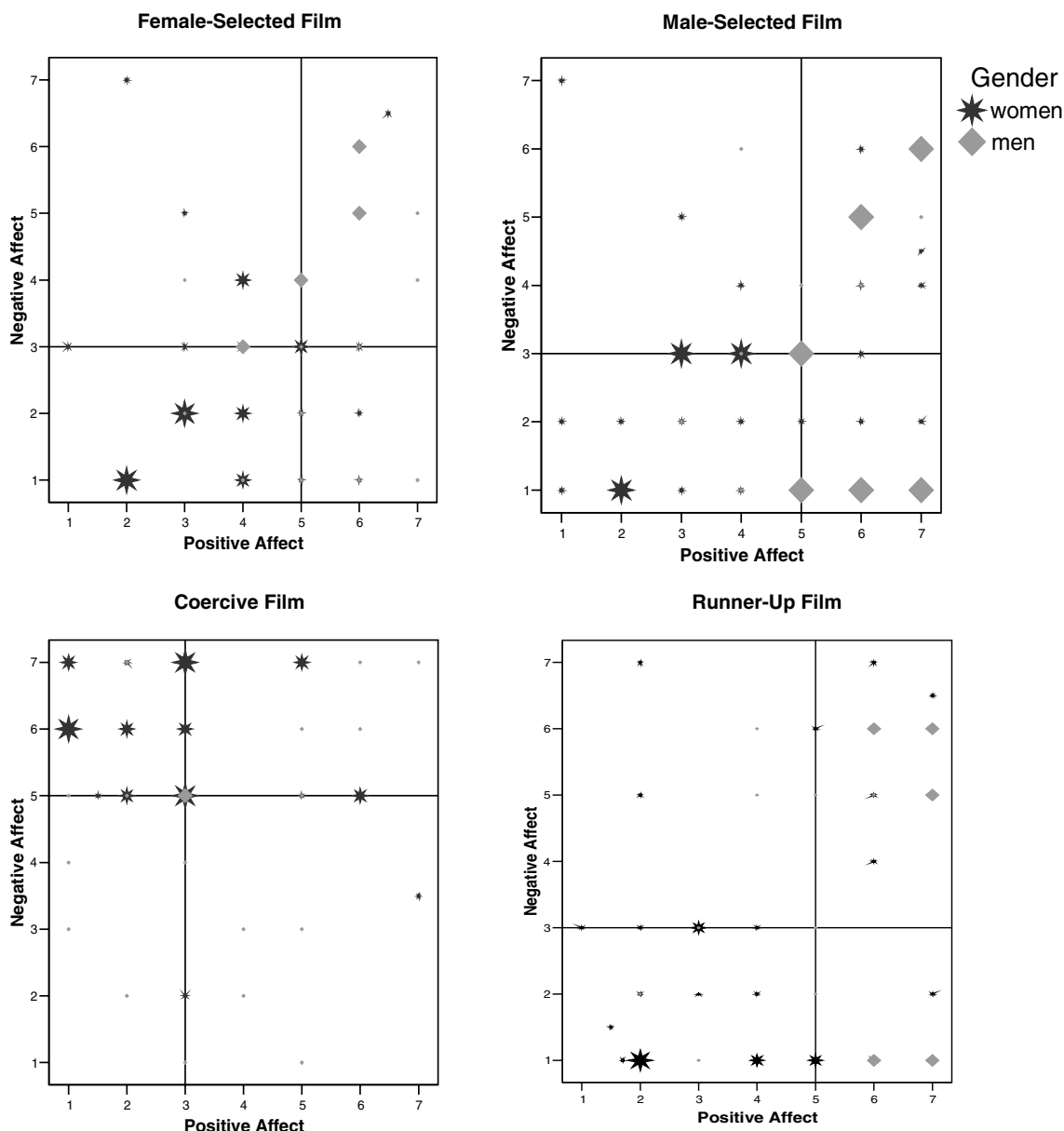
For the coercive film condition, gender accounted for 11% of the variance in subjective sexual arousal ( $p < .05$ ) with men reporting higher levels of subjective arousal than women. In the second step, the linear combination of positive and negative affect accounted for an *additional* 19% of the variance in subjective arousal ( $p < .01$ ), with positive affect, but not negative affect, making a significant independent contribution to the model (see Table 3). When the interaction between positive and negative affect was added in the third step, the new model accounted for a significant increase in explained variance,  $R^2 \Delta = .16$ ,  $p = .001$ . In this third step, positive affect was the strongest predictor after controlling for the other variables, but negative affect was also a significant predictor of subjective arousal (see Table 3). Additionally, the interaction between positive and negative affect significantly predicted arousal. The pattern of the interaction is shown in Fig. 2. Positive affect was consistently associated with subjective sexual arousal, and among participants who were low in positive affect, increases in negative affect were associated with increased levels of subjective arousal.

For the runner-up film condition, gender was a significant predictor of subjective arousal,  $R^2 = .30$ ,  $p < .001$ , with men reporting higher levels of arousal than women. In the second step, the linear combination of positive and negative

predictor variable to be interpreted as the simple effect of that predictor at the mean value of another predictor when their product also is included as a predictor.

<sup>4</sup> We also conducted separate analyses for men and women and found a similar pattern of results across genders.

<sup>5</sup> Aiken and West (1991) and Judd and McClelland (1989) have recommended using the centered scores (i.e., the mean subtracted from the individual scores) of the predictor variables and their product rather than the untransformed individual scores and their product. Use of the centered scores permits the regression coefficient associated with a pre-



**Fig. 1** Distribution of positive and negative affect ratings for the each of the four film conditions. Marker size indicates number of participants per data point, with larger markers indicating a larger number

of participants. Reference lines indicate median ratings of positive and negative affect for each film

affect accounted for an *additional* 35% of the variance in participants' subjective arousal ( $p < .001$ ) with, again, positive but not negative affect making a significant independent contribution to the model (see Table 3). The interaction entered in the third step of the regression was not a significant predictor.

*Predictors of sexual desire*

Results for all significant regression analyses with sexual desire as the criterion variable are summarized in Table 4. For the female- and male-selected erotic film conditions,

gender accounted for 30% and 26% of the variance in sexual desire, respectively ( $ps < .001$ ), with men reporting more desire than women in both conditions. The linear combination of positive and negative affect entered in Step 2 accounted for an *additional* 45% and 47% of the variance in sexual desire in the female- and male-selected films, respectively ( $ps < .001$ ). Positive affect, but not negative affect, significantly predicted desire for both film conditions (see Table 4). The interaction in third step of the regression analysis did not reach significance for either film condition.

For the coercive film, gender was not a significant predictor of sexual desire. However, after controlling for gender, the

**Table 2** Bivariate correlations between affect and sexual response variables for women and men

Variables	Negative affect <sup>a</sup>	Positive affect <sup>a</sup>	Subjective arousal	Sexual desire
	Women/Men	Women/Men	Women/Men	Women/Men
<b>Female-selected film</b>				
Positive affect	.16/.28	—	—	—
Subjective arousal	.25/.30	.67***/.54*	—	—
Sexual desire	.26/.22	.82***/.75***	.77***/.60**	—
Genital response	.13/.18	.27/.25	.06/.46	.16/.36
<b>Male-selected film</b>				
Positive affect	.25/.21	—	—	—
Subjective arousal	.30/.27	.73***/.54*	—	—
Sexual desire	.17/-.08	.81***/.75***	.88***/.65**	—
Genital response	.08/-.10	.17/.27	.20/.52*	.14/.43
<b>Coercive film</b>				
Positive affect	-.30/.27	—	—	—
Subjective arousal	-.25/-.15	.53***/.36	—	—
Sexual desire	-.22/-.06	.78***/.46*	.79***/.68**	—
Genital response	.44**/-.23	.12/-.05	.12/.26	.18/.05
<b>Runner-up film</b>				
Positive affect	.28/.21	—	—	—
Subjective arousal	.22/.11	.64***/.81***	—	—
Sexual desire	.21/.13	.65***/.87***	.87***/.87***	—
Genital response	.13/.05	.16/.45	.01/.51*	-.08/.38

<sup>a</sup>Positive affect and negative affect scores are based on each participant's maximum score on the sets of positive and negative emotion items.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

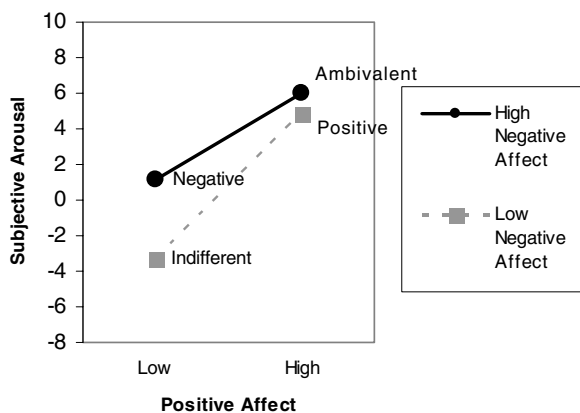
linear combination of positive and negative affect accounted for a significant amount of the variance in participants' desire ( $R^2\Delta = .39, p < .001$ ) with positive affect, but not negative affect, making a significant independent contribution to the model (see Table 4). The interaction did not reach significance in the third step.

Finally, for the runner-up film condition, gender accounted for 28% of the variance in sexual desire ( $p < .001$ ), with men reporting more desire than women. In the second step, the linear combination of positive and negative affect accounted for an additional 38% of participants' desire ( $p < .001$ ). Positive but not negative affect made

**Table 3** Summary of significant predictors from the regression analyses for subjective sexual arousal

Step/predictor	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>
<i>Female-selected film</i>				
Step 1/gender	1.47	.41	0.48	3.60***
Step 2/positive affect	0.56	.12	0.56	4.62***
<i>Male-selected film</i>				
Step 1/gender	1.52	.44	0.47	3.50***
Step 2/positive affect	0.55	.10	0.62	5.42***
<i>Coercive film</i>				
Step 1/gender	1.12	.49	0.33	2.31*
Step 2/positive affect	0.39	.13	0.41	3.11**
Step 3/gender	1.15	.46	0.34	2.48*
Step 3/positive affect	1.84	.43	1.92	4.29***
Step 3/negative affect	0.82	.32	0.83	2.59*
Step 3/interaction	-0.27	.08	-1.82	-3.50***
<i>Runner-up film</i>				
Step 1/gender	1.91	.45	0.55	4.27***
Step 2/gender	0.88	.37	0.25	2.42*
Step 2/positive affect	0.60	.10	0.66	6.11***

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .



**Fig. 2** Pattern of positive × negative affect interaction predicting subjective sexual arousal during the coercive film condition. High scores are equivalent to one standard deviation above the mean and low scores are equivalent to one standard deviation below the mean (Aiken & West, 1991)

a significant independent contribution to the model (see Table 4). The interaction was not a significant predictor of sexual desire in this condition.

*Predictors of genital response*

Because the different physiological measurements of genital response did not allow for cross-gender comparisons, analyses with genital response as the criterion variable were conducted separately for women and men. Results for all significant regression analyses with genital sexual response as the criterion variable are summarized in Table 5.

For the female-selected erotic film condition, neither the first nor the second step of the multiple regression accounted for a significant amount of the variance in women’s genital

**Table 5** Summary of significant predictors from the regression analyses for women’s genital response

Step/predictor	B	SE	β	t
<b>Male-selected film</b>				
Step 2/positive affect	16.36	5.57	1.14	2.94**
Step 2/negative affect	14.52	5.71	0.89	2.54*
Step 2/interaction	-4.17	1.45	-1.54	-2.87**
<b>Coercive film</b>				
Step 1/Negative affect	9.59	3.64	0.51	2.64*

\*p < .05. \*\*p < .01. \*\*\*p < .001.

response. Thus, in general, affective state was not predictive of women’s genital arousal in this condition.

For the male-selected film condition, the linear combination of positive and negative affect accounted for only 3% of the variance in women’s genital response (ns). However, when the interaction was added to the model in the second step, the analysis was significant ( $R^2 \Delta = .27, p < .01$ ). In the second step, both positive and negative affect independently and significantly predicted genital response. The interaction was also significant (see Table 5), such that when positive affect was low, higher negative affect was associated with increased genital response as depicted in Fig. 3.

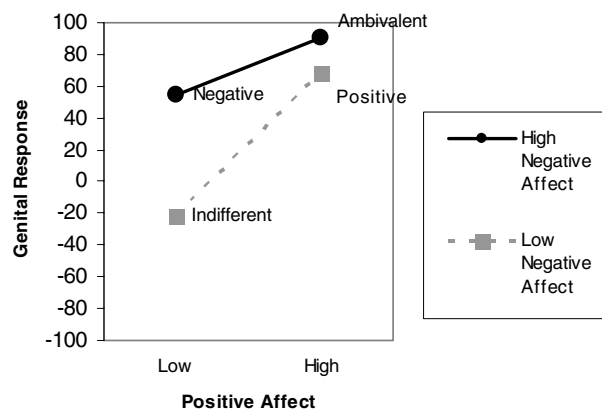
In the coercive film condition, the linear combination of positive and negative affect accounted for 25% of the variance in women’s genital response ( $p < .05$ ). Negative affect independently and significantly predicted genital response after controlling for positive affect (see Table 5). The interaction was not a significant predictor of genital response over and above positive and negative affect.

For the runner-up film condition, neither the first nor the second step of the multiple regression accounted for

**Table 4** Summary of significant predictors from the regression analyses for sexual desire

Step/predictor	B	SE	β	t
<b>Female-selected film</b>				
Step 1/gender	2.13	.50	0.54	4.25***
Step 2/gender	0.87	.35	0.22	2.51*
Step 2/positive affect	0.92	.12	0.72	8.02***
<b>Male-selected film</b>				
Step 1/gender	2.03	.52	0.51	3.92***
Step 2/gender	0.81	.35	0.21	2.31*
Step 2/positive affect	0.84	.10	0.77	8.39***
<b>Coercive film</b>				
Step 2/positive affect	0.66	.13	0.62	5.13***
<b>Runner-up film</b>				
Step 1/gender	2.35	.58	0.53	4.08***
Step 2/gender	0.98	.45	0.22	2.16*
Step 2/positive affect	0.80	.12	0.69	6.57***

\*p < .05. \*\*p < .01. \*\*\*p < .001.



**Fig. 3** Pattern of positive × negative affect interaction predicting women’s genital responses during the male-selected film condition. High scores are equivalent to one standard deviation above the mean and low scores are equivalent to one standard deviation below the mean (Aiken & West, 1991)

a significant amount of the variance in women's genital response. Thus, in general, affective state was not predictive of women's genital arousal in this condition.

For men across all four film conditions, neither the first nor the second step of the multiple regression were significant, suggesting that affective state was not a significant predictor of men's genital response in any condition.

## Discussion

### Positive and negative affect

Overall, positive affect was the best predictor of subjective arousal and desire in women and men across film conditions. In the regression analyses, negative affect failed to significantly predict subjective arousal and desire in women and men except for in the coercive film condition, where, in comparison to positive affect, negative affect was a relatively weak positive predictor of subjective arousal. Clinically, negative affect has often been assumed to be central to the etiology of sexual dysfunction (e.g., Kaplan, 1981; Masters & Johnson, 1970), but the results of this study are part of a growing body of research (e.g., Koukounas & McCabe, 2001; Mitchell et al., 1998; Nobre et al., 2004; Rowland et al., 1996) that suggests that it may be the absence of positive affect rather than the presence of negative affect that leads to diminished sexual response. This may explain why diminished sexual response is commonly associated with depression (e.g., Beck, 1967), a psychological state characterized by *low positive affect*, but diminished sexual response is not as commonly associated with anxiety (e.g., Cranston-Cuevas & Barlow, 1990), a state characterized by *high negative affect* (see Russell, 1980; Watson & Tellegen, 1985).

In the present study negative emotions had relatively limited predictive power in the case of subjective arousal and desire.<sup>6</sup> Among women, however, negative emotions were slightly better predictors of genital response as compared to subjective response. This was particularly true for the male-selected and coercive film conditions, perhaps because these films evoked somewhat higher levels of negative affect as compared to the other film conditions. Why would negative emotions be positively related to genital response levels? One possibility is that any emotional reaction (positive or negative) may facilitate genital response indirectly, through the activation of general autonomic arousal (e.g., Barlow, 1986). Alternatively, it may be the case that the women in our study who experienced a genital response in the male-selected and

coercive conditions felt negatively (e.g., guilty, ashamed, embarrassed) *about* their physiological sexual arousal (or its more detectable correlates; e.g., see Graham, Sanders, Milhausen, & McBride, 2004).

### Ambivalent affect

Based on our results, erotic stimuli clearly appear to have the potential for inducing mixed or ambivalent emotional states in both men and women. During each film condition, the majority of our participants reported some co-occurring positive and negative affect. It is important to note that based on our results, we cannot evaluate whether the "co-occurring" positive and negative emotions occurred at *exactly* the same moment or if the positive and negative emotions occurred in succession sometime during the three-minute film clip. Nevertheless, our results at least provide evidence that a single, brief *emotional episode* can include both positive and negative emotions. More evidence for the presence of ambivalence is that positive and negative affect were weakly but positively correlated for many of the film conditions, suggesting that positive emotions and negative emotions are not mutually exclusive.

In contrast to other conditions, it is noteworthy that positive and negative affect were negatively correlated for women in the coercive film condition. The coercive film condition was associated with relatively high levels of negative affect, particularly among women. Thus, this finding provides some support for the idea that positive and negative affective dimensions may be independent when negative affect is relatively low but bipolar when negative affect is at higher levels (Diener & Iran-Nejad, 1986; Reich et al., 2003).

Along with providing support for the idea that erotic stimuli can elicit ambivalent emotional states, we found evidence that ambivalence can be associated with relatively high levels of sexual arousal and desire. That is, our findings suggest that ambivalence tends to be associated with approximately the same intensity of sexual response as positive affect, and with greater subjective response than either negative affect or indifference (i.e., low levels of both positive and negative affect). Our results thus support Heiman's (1980) speculation that negative affect, when combined with positive affect, does not necessarily diminish sexual response. These findings have potentially important clinical and research implications. For example, based on these findings, we may hypothesize that sex therapy interventions aimed at increasing sexual arousal and desire by increasing positive emotions in sexual situations (e.g., creating contexts that increase feelings of passion, interest, and sensuality) are likely to be more successful than interventions aimed at merely eliminating negative emotions (e.g., reducing feelings of guilt or shame). From a research perspective, these preliminary results suggest that studies evaluating affect and sexual response may

<sup>6</sup> Some of our non-significant findings may have been a result of insufficient power due to our small sample size. This is particularly true of the analyses on men's genital response ( $n = 19$ ).

benefit from recognizing that positive and negative affect can co-occur in sexual situations.

### Affective indifference

We approached this study with a particular interest in ambivalent emotional states; however, our findings suggest that the concept of *indifference* (low positive and low negative affect) also may be important in understanding the relationship between affect and sexual response, at least in some contexts. In two instances (i.e., predicting participants' subjective arousal in the coercive film condition and predicting women's genital response in the male-selected film condition), affective indifference was associated with lower levels of sexual response than were ambivalent, positive, or negative affect. Although this finding is preliminary and not consistent across film conditions or across genders, the very fact that some individuals in our study responded to the experimental stimuli with low levels of both positive and negative affect raises some interesting questions: What might cause one to react to explicit or threatening erotic stimuli with emotional indifference? How is emotional indifference related to the concepts of boredom, inattention, lack of absorption, lack of imagined involvement, or habituation (see e.g., Janssen et al., 2003; Koukounas & McCabe, 2001)?

If it is true that emotional indifference is associated with particularly low levels of sexual response, this could have important implications. Clinically, this finding suggests that couples struggling with diminished sexual interest might benefit from trying new and innovative sexual activities even if such activities create mild anxiety or embarrassment. Further, if negative emotions can actually facilitate arousal in certain situations, this could help explain some individuals' motivation to engage in risky sexual behaviors. For individuals who are low in positive emotions, engaging in risky sexual activities may promote mildly negative but also arousing emotions such as anxiety, guilt, and shame, and for them, risky sex may be a problematic but effective way of self-treating diminished sexual responsivity. This is consistent with the suggestion by other authors that engaging in risky sex can be a way to overcome low sexual responsivity (e.g., Bancroft et al., 2003a,b). Of course, as mentioned previously, it is possible that negative emotions only facilitate sexual response at lower or intermediate intensities; higher intensities of negative affect may be less compatible with sexual arousal and desire, at least for most individuals (cf. Bancroft et al., 2003a,b).

It is also possible that there may be similarities between the individuals that we have labeled "indifferent" and individuals who are *emotionally avoidant*. Several theorists (e.g., Hayes, Strosahl, & Wilson, 1999; Linehan, 1993) have proposed that some individuals attempt to inhibit or numb their emotions with the intent of avoiding the suffering as-

sociated with their negative emotions or with the intent of controlling the expression of their emotional responses. As a consequence, these individuals may become cut off from their emotions (both positive and negative), and theoretically, this could include becoming cut off from their sexual feelings (e.g., see Leonard & Follette, 2002). Future research is needed to evaluate further the relationship between emotional avoidance and sexual functioning. If emotional avoidance is consistently associated with low or absent sexual responses, this would suggest that some sexual problems might be successfully addressed using psychological interventions that encourage generalized emotional acceptance (e.g., see Hayes et al., 1999).

### Summary

We found that positive and ambivalent affect were associated with relatively high levels of subjective sexual response in most conditions. However, there were some inconsistencies in our results regarding the relationship between affect and sexual response. For example, based on the results of our bivariate correlations, positive affect was strongly and consistently correlated with desire but less strongly and consistently with subjective arousal among men. Similarly, based on the regression analyses, among women, negative affect was predictive of genital response in some but not all film conditions. It is possible that some of these inconsistencies would have been less apparent if a larger sample size had been used. However, it is also the case that some of the inconsistencies found in this study mirror the complex findings of previous studies (e.g., Heiman, 1980; Rowland et al., 1996). The lack of consistency regarding the relationship between affect and sexual response points to three potentially important considerations for future research on this topic.

First, more attention needs to be devoted to individual differences in the relationship between affect and sexual response. There is research to suggest that, although some men and women report diminished sexual desire and arousal in response to negative emotional states, other individuals report heightened sexual response in conjunction with negative emotions (Bancroft et al., 2003a, 2003b; Lykins, Janssen, & Graham, 2006). In the future, researchers should consider including relevant measures of individual differences (e.g., levels of sexual excitation and inhibition; sensation-seeking tendencies; mood traits, including depression- and anxiety-proneness) as potential moderators or mediators when investigating the relationship between affect and sexual response.

Second, it is important to consider the role of contextual variables in relation to sexual response. Clinicians and researchers have pointed out that the experience of sexual arousal and desire are more than an automatically generated reaction to sexual stimuli (e.g., Basson, 2003; Laan & Janssen, *in press*; Tiefer, 1991; Tolman & Diamond, 2001).

Rather, sexual response involves an interaction of social, psychological, and physiological factors, and thus can be expected to be sensitive to situation and context. Therefore, it may not be surprising that in our laboratory study, the different contexts depicted in the erotic film excerpts—the setting of the erotic encounter, the apparent relationship between the sexual partners, and obviously the coercive nature of the third film clip—may have resulted in slightly different patterns of results across conditions. In real life sexual situations, the role of affect in sexual response may vary in more dramatic ways based on important contextual variables such as an individual's degree of closeness and equity with his or her sexual partner or the comfort of an individual's physical environment. A better understanding of the role of contextual variables is needed in order to fully understand the relationship between affect and sexual response—perhaps especially subjective sexual response.

Third, in this study, we evaluated the role of generalized positive and negative emotional states, treating specific emotions (e.g., interested, sad, pleasant, angry, anxious) as markers for general, underlying emotional dimensions. This approach is consistent with several theories of emotion (Cacioppo et al., 1999; Diener & Iran-Nejad, 1986; Reich et al., 2003; Watson et al., 1999). However, there is some evidence that, when evaluating the role of affect in sexual response, there is value in analyzing the specific primary markers of emotion rather than the underlying positive or negative dimensions (e.g., Rowland et al., 2003). Thus, ambivalent emotional states may not all be equal in terms of their impact on sexual response, particularly as some emotional states may involve more generalized physiological arousal or activation than others (e.g., Watson et al., 1999). For example, excitement (a positive emotion) combined with anxiety (a negative emotion) may represent an ambivalent emotional state that is associated with high levels of generalized activation (and thus sexual arousal); whereas, calmness (a positive emotion) combined with sadness (a negative emotion) may be a mixed emotional state that is associated with low levels of generalized activation and sexual arousal. Future research could investigate the impact of various combinations of specific emotional states on sexual response.

In conclusion, although preliminary in nature, the present findings point to the importance of considering mixed or ambivalent emotional states when studying the relationship between affect and sexual response. By examining positive and negative affect independently without explicitly addressing the potential effects of ambivalence (or indifference), research in this area is likely to leave us with an incomplete picture of the relationship between emotions and sexual arousal and desire. If, as many researchers have proposed, sexual response involves a complex interaction of social, psychological and physiological factors, it should not be surprising that individuals often respond to sexual situations

with complex or ambivalent emotional states. A better understanding of such mixed affective states may contribute to our understanding of the factors that enhance and inhibit sexual desire and arousal.

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