

## Women's Sexual and Emotional Responses to Male- and Female-Produced Erotica

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*Whether erotic films made by women are more arousing for women than erotic films made by men was studied. Forty-seven subjects were exposed to both a woman-made, female-initiated, and female-centered, erotic film excerpt and a man-made, male-initiated, and male-centered erotic film excerpt. Photoplethysmographic vaginal pulse amplitude was recorded continuously. Self-report ratings of sexual arousal and affective reactions were collected after each stimulus presentation. Contrary to expectation, genital arousal did not differ between films, although genital response to both films was substantial. Subjective experience of sexual arousal was significantly higher during the woman-made film. The man-made film evoked more feelings of shame, guilt, and aversion. Correlations between subjective experience of sexual arousal and photoplethysmographic measures of sexual arousal were nonsignificant. The largest contribution to female sexual excitement might result from the processing of stimulus-content and stimulus-meaning and not from peripheral vasocongestive feedback.*

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**KEY WORDS:** female sexual arousal; vaginal plethysmography; erotica; emotion; concordance.

### INTRODUCTION

According to Barlow's (1986) feedback loop model of erectile disorders, affective responses seem to be determined by the interpretation of the context in which a sexual activity takes place. Positive affect and expectancies as elicited by certain sexual contexts increase attentional focus

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on erotic cues and increase autonomic arousal, including genital vasocongestion. Barlow's view implies that there is concordance between measures of subjective experience and genital vasocongestion. Thus far, it has been found that correlations between subjective and genital measures are specifically low and variable in women (see Rosen and Beck, 1988, for a review). Barlow (1986) speculated that his model of sexual excitement in men might also apply to sexual excitement in women. However, he did not provide data to substantiate this claim.

According to Dekker and Everaerd (1989), sexual arousal in response to erotica is facilitated when subjects perceive their identification figure as being in control of or dominating the sexual interaction. In the first study in which subjective responses were compared with genital responses, Heiman (1977) found evidence of similarities between men and women in response to erotic audiotapes. Her study showed dominance of the identification figure, defined as taking the initiative to engage in sex and controlling the sexual interaction, to be an important determinant of sexual arousal in response to erotica. Two sex-role dimensions were selected: who initiated sexual activity and on whom most of the description was focused. Although it was expected that the male-initiated, female-centered audiotape would be the more role-abiding and thus more arousing script, results indicated that in female subjects an active woman in the story led to more genital arousal than an active man. In contrast to popular opinion that emphasizes that romantic elements are essential for female sexual arousal, Heiman also found that women were no more responsive (both subjectively and physiologically) to romantic script elements than were men, and that erotic content alone was responsible for arousal in both sexes.

Previous research (Mavissakalian *et al.*, 1975; Hoon *et al.*, 1976; Wincze *et al.*, 1977; Steinman *et al.*, 1981; Julien and Over, 1988) demonstrated that erotic films can produce reliable changes in male and female arousal responses. Until recently, the erotic film industry was governed by male producers and directors, whose products focused on a male public. In 1984, the first erotic films from a women's perspective, produced and directed by a woman, were released.

What makes an erotic film appealing and sexually arousing for women? The producer of the first female-oriented erotic films stated that her films are female-initiated; the sexual partners have equal roles as far as sexual desire and sexual pleasure are concerned; the actors are really attracted to each other; prolonged foreplay (stroking and kissing) is an important ingredient; and there is not as much emphasis on intercourse as in male-oriented erotic films. These films are considered to differ on a number of technical aspects as well: Free camera movements that allow

for continuous action; long shots, and indirect illumination creating a friendly atmosphere (de Wit, 1987).

The erotic films as described above (for convenience we refer to this genre as "woman-made films" as opposed to "man-made films") seem to satisfy the requirements for sexual excitement that have been established in the research reviewed in this introduction. We studied whether a woman-made film would enhance positive affect in female subjects, resulting in increased attentional focus on erotic cues and increased subjective and genital sexual arousal. Since a typical, man-made erotic film would not enhance positive affect in female subjects, subjective and genital sexual arousal was expected to be lower as compared with the woman-made film. We compared a woman-made and a typical man-made erotic film excerpt considered to be representative of each genre by showing them to female subjects. Because these excerpts were selected from a large pool of films, in the sense of stimulus samples this is a single-case design.

We predicted (i) the woman-made film would result in more subjective sexual excitement as well as in a larger genital response (vasocongestion), (ii) the woman-made film would elicit positive affect, the man-made film would elicit neutral or negative affect, (iii) the correlation between subjective responses and genital vasocongestion would be higher for the woman-made film.

## METHOD

### Subjects and Setting

Fifty-three heterosexual women participated in the study: 23 were undergraduate psychology students, and 30 were friends or acquaintances of the experimenters. The students received course credit for their participation, the remaining subjects were given a small box of candy. The sample was select in that 45% of the students who subscribed to the experiment chose not to participate after the information session. Two subjects of the other group decided not to participate after the information session. As in most studies employing vaginal measures of sexual arousal, the volunteer bias as described by Wolchik *et al.* (1983, 1985) may be applicable to our subject sample.

Confidentiality, anonymity, and the opportunity to withdraw from the experiment without penalty were assured to all subjects. The procedure, including the use of erotic film excerpts and genital measures, was described beforehand. To minimize coercion, subjects were given a tentative second appointment for another day, in order to give them time to consider

participation. At this point, an anamnestic interview was held to exclude sexual dysfunction and psychiatric history.

Due to technical problems in the course of the experiment, the results of 6 subjects were eliminated. The remaining 47 subjects were between 18 and 38 years ( $\bar{x} = 25$ ), 68% were students (both graduate and undergraduate). Thirty-six students (76%) had steady partners, the mean duration of relationships was 3 years with the range between 2 months and 8 years; all subjects had had coital experience. On a 7-point scale the mean satisfaction rating for the relationship was 5.8 (happy). The mean rating for satisfaction with sex in the relationship was 6.5 (very satisfactory). The majority of subjects had seen erotic films before participation ( $\bar{x} = 4$  films); 32% had never seen an erotic film before; 13% had seen 10 or more.

Subjects were not tested during menstruation. Eighteen (38.3%) were tested in the first week after menstruation, 34% ( $n = 16$ ) in the second week after menstruation, and 27.7% ( $n = 13$ ) in the third or fourth week. Contraceptive use varied considerably: 19 women (40.4%) used hormonal contraception (the pill), 8 women (17%) used condoms, 3 women (6.4%) used a diaphragm, and 10 women (21.3%) used some other contraceptive means or nothing at all.

The research was conducted in the Psychology Laboratory of the University of Amsterdam. The two female authors (E. L. and G. v. B.) served as experimenters. A subject who was a friend or acquaintance of one experimenter was tested by the other experimenter.

All issues relating to subject participation were screened by the appropriate university committee and were in compliance with the concept of fully informed, voluntary consent.

## Design

The independent variables consisted of film content (woman-made vs. man-made), and film order. Subjects were assigned randomly to one of two groups in a repeated measures design. Group 1 ( $n = 23$ ) saw the man-made film first, followed by the woman-made film, Group 2 ( $n = 24$ ) saw the film excerpts in the reverse order.

## Apparatus and Materials

### *Stimulus Materials*

Two 11-min film excerpts were shown. One excerpt was taken from a typical man-made, male-initiated, and male-centered erotic film. The

choice of the film was determined by the highest lending rate in a regular video shop and was considered representative of the genre. The other film excerpt was taken from a female-initiated, female-centered erotic film, made by a woman who had been a porn actress herself, but had decided to make her own films out of dissatisfaction with the arousing quality of regular man-made erotic films for female spectators.

The two excerpts were paralleled as far as sexual activity was concerned. Sexual portrayals in both film excerpts were of a heterosexual nature; no homosexuality, incest, sadomasochistic, or related themes were included.

The film excerpts differed as far as the setting for the sexual activity was concerned. The man-made excerpt was enacted in an obviously brothel-like environment, in which the man was awaiting the services of an unacquainted woman. The woman-made film took place in an elevator in which the woman and man met. Another important difference between film excerpts related to the amount of foreplay involved. In the man-made film there was no foreplay at all, and nonsexual details were minimized. The woman-made film consisted of a 4-min scene in which mutual sexual attraction developed, involving glancing at each other, resulting in stroking, kissing, and eventually in mutual undressing.<sup>3</sup> Both film excerpts are considered to be of an explicit pornographic nature.

Subjects participating in other experiments conducted by the first author were able to discriminate perfectly between the two genres. Queries among friends and colleagues supported our opinion about the differential qualities of both types of film.

### *Physiological Recording*

Genital responses were recorded on a Nihon Khoden EEG-4317 polygraph. A vaginal photoplethysmograph measured pulse amplitude (the a-c component of the signal) and blood volume (the d-c component; Sintchak and Geer, 1975). Only the a-c component was used for analysis since this measure is considered more sensitive and reactive than the d-c component (Geer *et al.*, 1974; Heiman, 1977; Osborn and Pollack, 1977; Hatch, 1979; Beck *et al.*, 1983; Korff and Geer, 1983). The a-c channel recorded changes in light reflected from the vaginal wall. Sensitivity of the a-c preamplifier was set at 10  $\mu\text{V}/\text{cm}$  for all subjects. The a-c preamplifier was calibrated at 100  $\mu\text{V}$ . A Krohn-Hite filter (type 3323) was used to remove all muscle artifacts (bandpass 0.5 Hz–35 Hz). The genital device was put in place by

<sup>3</sup>A detailed description of both film excerpts is available upon request.

the subject without the experimenter's help. Subjects had received careful instructions to insert the probe with the light-emitting diode facing the anterior aspect of the vaginal wall. Since Geer (personal communication, 1990) found no differential effects during tests in which depth of the probe and positioning of the light-emitting diode were varied, the procedure to have subjects insert the probe themselves was followed to ensure maximum privacy during the experimental session. The device was sterilized in a solution of Cidex-activated glutaraldehyde (Geer, 1980) before use.

### *Subjective Measurement*

After each stimulus presentation four discrete measures of subjective arousal were collected (cf. Henson *et al.*, 1979; Mosher and White, 1980). Subjects were asked to assess on a 7-point Likert scale (a) their overall subjective arousal; (b) their strongest feeling of sexual arousal; (c) their strongest genital sensations, and (d) their strongest extragenital sensations. Each point of the Likert scales was described by a verbal label. The extremes of the scales were *not sexually aroused at all* and *very strongly sexually aroused* for items (a) and (b); *no sensations in my genitals* and *orgasm* for item (c); *not at all* and *very strong* for item (d).

An additional measure of emotional experience was collected after each stimulus presentation. Each subject was asked to assess on 7-point Likert scales the degree to which they experienced 10 emotions (interest, surprise, disgust, distress, shame, contempt, guilt, anger, fear, and enjoyment) taken from the Differential Emotion Scale (Izard, 1972). This scale was abbreviated by giving only one description of each emotion. Six sexual emotions (e.g., sensual, horny) were added to the scale. The extremes of these 7-point scales were *not at all* and *very strong*.

### *Personal History Questionnaire*

This questionnaire, given prior to the experiment, was designed to assess personality characteristics and frequency and variety of sexual behaviors and experiences (Dekker *et al.*, 1985). The questionnaire was used to correlate prior sexual experiences and sexual responsiveness in the laboratory.

### **Procedure**

To help subjects make an informed decision about whether to participate in this experiment, they first took part in an introductory session

in which all experimental procedures were explained in detail. Subjects were told that they would be asked to complete a Personal History Questionnaire that assessed personality characteristics and frequency and variety of sexual behaviors and experiences. They were shown the vaginal photoplethysmograph and were informed about the sterilizing procedures. Although subjects were told that the film excerpts were of an explicit pornographic nature, they were left unaware of the specifics of the stimulus materials. Subjects were assured privacy, anonymity, and confidentiality, and it was stressed that they could withdraw from the experiment at any time, without penalty. Any questions were answered at this time. At the end of this introductory session subjects were asked to make a tentative future appointment for the experimental session. Appointments were made so that subjects would not menstruate during the experimental session. No pressure was exerted on anyone to participate. Appointments could later be confirmed by phone.

In the experimental session each subject was tested individually. On arrival at the laboratory, the subject read and signed an informed consent form and completed the Personal History Questionnaire. Several questions were asked concerning contraception, length of menstrual cycle, and date of last menstruation. Then the experimenter explained to the subject how to attach the genital device.

After the experimenter had left the room, the subjects inserted the probe in private. When the subjects signaled (using a one-way intercom system) that the transducer had been attached, a 10-min adaptation period was interposed, after which a 3-min baseline period was run. During this 13-min resting period subjects listened to music. After the first film excerpt was shown, subjects rated their subjective arousal and their emotional experiences. Between the two film presentations there was a 3-min return-to-baseline interval, during which subjects were asked to complete a paper-and-pencil concentration task. To justify this task, subjects had been told in advance that one of the goals of the research was to investigate the effect of sexual arousal on the ability to concentrate. The interval was followed by a second 3-min baseline recording period, during which subjects listened to music. Then the second film excerpt was shown, followed by a second rating of subjects' subjective arousal and emotional experiences.

At the end of the experiment subjects were asked to respond to a series of questions pertaining to their reactions to the films, their ability to concentrate, their use of the genital device, and their expectancies concerning the objectives of the study. Immediately following the experimental session each subject was debriefed.

## Data Reduction, Scoring, and Data Analysis

Vaginal pulse amplitude was sampled every 30 sec across the baseline and stimulus presentation periods. This produced a total of 22 data points for each film presentation per subject. Each data point was recorded in millimeter pen deflection. Changes in the amplitude of the signal reflected changes in the sexual response. Differences between baseline physiological measures and evoked physiological measures provided indices of change in sexual responding. By calculating differences between baseline physiological measures and evoked physiological measures it was possible to control for between-subject differences in resting baseline. Both mean and maximum amplitude were computed for the vasocongestion measure. Physiological data were hand-scored with each record scored independently by two raters for a reliability check ( $r = .98$ ).

The first baseline was used as a reference, rather than the subsequent interstimulus interval baseline, because the paper-and-pencil concentration task was conceptualized as an opportunity to observe decrease of vaginal vasocongestion. We therefore did not wish to correct for arousal that had developed during the first erotic film excerpt (Myers and Morokoff, 1986). However, additional analyses were done to control for differences between original and second baseline (see Results).

The four discrete measures of subjective sexual arousal were analyzed separately. The 16 emotions were considered to be able to reflect positive and negative affect. Clusters of pleasurable, aversion, and guilt feelings were confirmed by factor analysis. The BMDP 4V program (1985 edition) was used for the multivariate and univariate ANOVAs.

## RESULTS

### Subjective and Genital Sexual Arousal to Man-Made and Woman-Made Films

Using a 2 within-subjects factor (man-made and woman-made film)  $\times$  2 between-subjects factor (order of presentation) design, differences in mean and maximum genital response and in subjective experience were tested with multivariate and univariate ANOVAs ( $\alpha = 0.05$ ). The multivariate procedure was performed separately for mean and maximum genital response (Table I).

For film content (man-made vs. woman-made) the multivariate test was significant,  $F(5, 41) = 2.71, p < 0.05$ . For order of films and for the interaction of Film Content  $\times$  Film Order multivariate tests were not sig-



**Table I.** Genital and Subjective Responses During the Man-Made Film and the Woman-Made Film ( $N = 47$ )

Arousal measures	Responses			
	Man-made film		Woman-made film	
	$\bar{x}$	SEM	$\bar{x}$	SEM
Vasocongestion				
Mean response <sup>a</sup>	6.59	0.77	7.28	0.92
Maximum response <sup>a</sup>	10.83	0.98	12.37	1.16
Experience of sexual arousal				
Overall subjective arousal <sup>b</sup>	3.51	0.22	4.15	0.19
Strongest sexual arousal <sup>b</sup>	4.47	0.23	5.00	0.19
Strongest genital sensations <sup>c</sup>	3.60	0.23	4.15	0.22
Strongest extragenital sensations <sup>d</sup>	3.11	0.24	3.74	0.22

<sup>a</sup>Millimeters change from original baseline.

<sup>b</sup>1 = not sexually aroused at all to 7 = very strongly sexually aroused.

<sup>c</sup>1 = no sensations in my genitals to 7 = orgasm.

<sup>d</sup>1 = not at all to 7 = very strong.

nificant. Univariate tests of genital data for film content revealed that mean and maximum genital response, although substantial, did not differ significantly between films. Subjective responses showed a larger response for the woman-made film: overall subjective arousal,  $F(1, 45) = 10.45$ ,  $p < 0.01$ ; strongest feeling of sexual arousal,  $F(1, 45) = 8.82$ ,  $p < 0.01$ ; strongest genital sensations,  $F(1, 45) = 7.15$ ,  $p < 0.01$ ; extragenital sensations,  $F(1, 45) = 9.81$ ,  $p < 0.01$  strongest (Fig. 1).

Genital responses of 20 subjects, equally divided between film order groups, approached the original baseline level in the 6-min interstimulus baseline interval (3-min return-to-baseline interval during which the paper-and-pencil concentration task was filled out plus a 3-min second baseline recording period during which subjects listened to music). Differences in both original and second baseline between film order groups were not significant. However, since baseline shifts of the 27 subjects who did not return to the original baseline might influence response levels during the second stimulus condition, additional analyses, testing for a film content effect were run, using the second baseline rather than the original baseline to compute difference scores for the second film presentation. The results using the second baseline were equivalent to those using the original baseline.

To investigate the influence of the Law of Initial Value (LIV) on the findings in this study, baseline scores were correlated with the individuals' mean difference scores on the first and second film presentation. In accordance with findings of Rothenberg and Geer (1980) and Stock and Geer

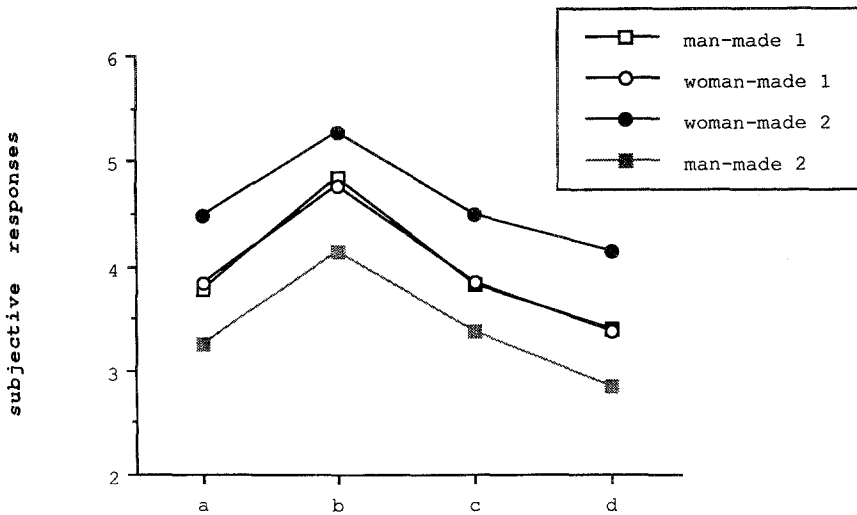


Fig. 1. Subjective responses during the man-made film and the woman-made film ( $N = 47$ ). "Man-made 1" refers to the man-made film when seen first; "man-made 2" refers to the man-made film when seen after the woman-made film. The same applies to "woman-made 1" and "woman-made 2." a = overall subjective arousal (from 1 = not sexually aroused at all to 7 = very strongly sexually aroused); b = strongest feeling of sexual arousal (from 1 = not sexually aroused at all to 7 = very strongly sexually aroused); c = strongest genital sensations (from 1 = no sensations in my genitals to 7 = orgasm); d = strongest extragenital sensations (from 1 = not at all to 7 = very strong).

(1982), the correlation between original baseline and difference scores on the first film presentation was significant,  $r(45) = .37, p < 0.05$ , indicating a reversed or anti-LIV effect. This might point to a tendency for subjects with larger resting vaginal pulse amplitudes to yield larger responses to erotic stimuli. A closer look at the individual data, however, revealed that only one subject contributed significantly to this relationship. After this outlier was removed the correlation dropped,  $r(44) = .10, p > 0.5$ . The correlation between difference scores on the second film presentation and second baseline scores was not significant,  $r(45) = .15, p > 0.3$ . Stemmler and Fahrenberg (1989) suggested that adverse LIV effects are small as long as (i) subjects have been randomly assigned to groups; (ii) group difference scores instead of individual difference scores are used, and (iii) individual differences in prestimulus scores are not too small. Although this study was designed to meet the first two conditions, and individual differences in prestimulus scores were observed, a multivariate analysis of covariance using the first baseline as the covariate was performed to make sure that the main effects reported above were not affected by baseline-response relationships. The covariance analysis revealed the same effects as noted

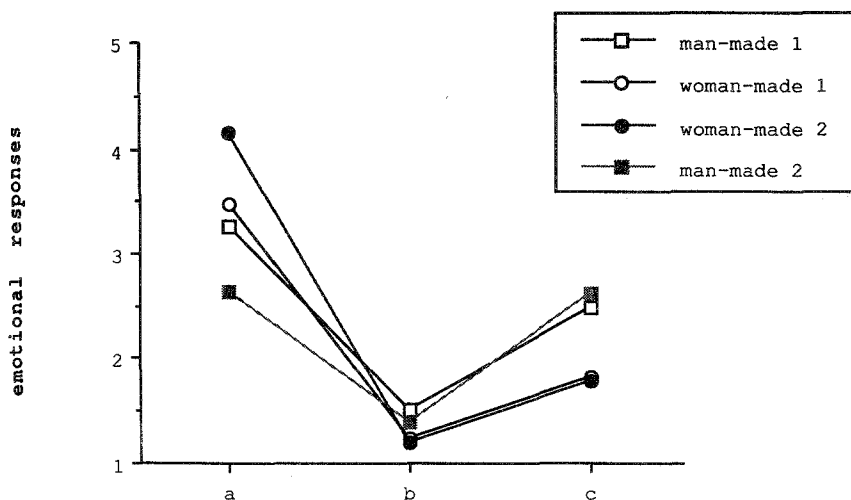


Fig. 2. Emotional responses during the man-made film and the woman-made film ( $N = 47$ ). "Man-made 1" refers to the man-made film when seen first; "man-made 2" refers to the man-made film when seen after the woman-made film. The same applies to "woman-made 1" and "woman-made 2." a = positive affect (from 1 = not at all to 7 = very strong); b = guilt and shame (from 1 = not at all to 7 = very strong); c = aversion (from 1 = not at all to 7 = very strong).

above with essentially no change in  $F$  values and no change in  $p$  levels resulting from the use of the covariance analysis.

### Positive and Negative Affect in Relation to Film Content

Principal component factor analysis with varimax rotation confirmed the structure of the emotion scales; 13 emotions were divided into 7 pleasurable emotions reflecting positive affect (consisting of all sexual emotions plus enjoyment; Cronbach's  $\alpha = .91$ ), 3 emotions indicating aversion (disgust, contempt, and anger;  $\alpha = .81$ ), and 3 emotions relating to guilt and shame (distress, shame, and guilt;  $\alpha = .74$ ) (Fig. 2). The last two factors reflected negative affect. The factor solution explained 68.9% of the variance. Three of the 16 emotions did not contribute to the factor solution.

The emotions contributing to the factor reflecting positive affect were averaged and used in a multivariate analysis. A similar procedure was followed for the emotions contributing to the second and the third factor.

We found an apparent effect of film content, multivariate:  $F(3, 43) = 16.39, p < 0.001$ , for the three emotion factors. Univariate tests revealed

that positive affect was more intense with the woman-made film and negative affect (both aversion, and guilt and shame) was more intense with the man-made film. Univariate tests were significant for each emotion factor: positive affect,  $F(1, 45) = 28.13, p < 0.001$ ; aversion,  $F(1, 45) = 27.02, p < 0.001$ ; guilt and shame  $F(1, 45) = 10.30, p < 0.01$ .

### Agreement Between Measures of Genital Vasocongestion and Measures of Subjective Excitement

The correlation between genital and subjective measures was expected to be higher in the woman-made film data. Subjective measures indicated that more arousal was experienced in reaction to the woman-made film but this was not observed for genital arousal. It is therefore not surprising that Pearson's product-moment correlations between subjective and genital measures were low and statistically nonsignificant (Table II).

Of all correlations between four subjective measures and two measures of genital vasocongestion (mean and maximum) for each of two films and for order of presentation (32 correlations) only 2 were significant ( $p < 0.05$ ); "strongest feeling of sexual arousal" and mean genital response on woman-made film when seen first:  $r = .40$ , and "overall subjective arousal" and mean genital response on woman-made film when seen after the man-made film:  $r = -.45$ . Two significant correlations of a possible 32 are likely to be spurious. Moreover, these low correlations cannot be explained by restriction of range of the subjective measures, since variances of these measures are sufficient. We therefore disregard these correlations.

**Table II.** Pearson's Product-Moment Correlations Between Mean and Maximum Genital Arousal and Subjective Measures of Sexual Arousal<sup>a</sup>

Experience of sexual arousal	Film order			
	1. Man-made	2. Woman-made	1. Woman-made	2. Man-made
Overall subjective arousal	.00	-.45 <sup>b</sup>	.36	.31
	-.12	.31	.21	.12
Strongest sexual arousal	.01	-.37	.40 <sup>b</sup>	.30
	-.12	.22	.24	.08
Strongest genital sensations	.32	-.10	.28	.31
	.13	-.01	.21	.10
Strongest extragenital sensations	.07	-.27	.33	.36
	.01	-.05	.22	.20

<sup>a</sup>The upper correlation refers to mean genital arousal, the lower correlation refers to maximum genital arousal.

<sup>b</sup> $p < 0.05$ .

We conclude that this study does not provide evidence for larger correlations in response to woman-made films.

## Other Results

### *Subjects' Responses at Exit Interview*

Almost all subjects enjoyed participation in the experiment although they appreciated different aspects of the situation. Some were surprised in a pleasant way at not feeling hurt or annoyed by the films.

In their evaluations of the films a number of differences were described. Thirty-two subjects only used positive adjectives in describing the woman-made film (e.g., funny, exciting, sensual, cute, normal, beautiful, arousing, better, recognizable, suggestive, real, surprising). The man-made film was often ( $n = 25$ ) described in a negative way (e.g., awful, not funny, coarse, traditional, ordinary, ludicrous, banal, bad, fuck-oriented, distasteful, obscene, unesthetic). Eight subjects had a negative opinion about both films, and 7 subjects were positive about both films.

In response to a question concerning the sexually stimulating qualities of each film, most subjects were uncertain. However, 8 subjects were convinced that the woman-made film had more arousing characteristics. Nine subjects were confident that the man-made film had this quality, although they added that they liked watching the woman-made film more.

Suggestions for improving the arousing quality of erotic films in general were unsystematic. However, there was much agreement among subjects when asked why erotic films are important for men. According to our subjects, visual stimuli are important for men, they are attracted by submissive women and by the men who are in general portrayed as successful and confident lovers.

From the interviews it became clear that most women have strong opinions about differences between the films we used in our experiment and about erotic films in general. Notwithstanding these opinions, they did not refuse participation, nor did anyone discontinue from participating in the experiment.

### *Correlates of Experimental Data with Menstrual Cycle, Contraceptive Use, and Sexual Experiences*

Menstrual cycle data were used to form a follicular and luteal phase group of subjects. Phases were derived from the standard menstrual cycle phases of Shaw (1978). None of the dependent variables proved signifi-

cantly different between menstrual phase groups. Furthermore, correlations of genital and subjective responding over days of menstrual cycle were not significant. Differences between the group using contraceptive pills and the group of subjects using none or other (nonhormonal) contraceptive devices were also examined. No significant differences emerged. Frequency of masturbation was not related to genital vasocongestion or to subjective experience of sexual arousal.

A nonparametric test (Mann-Whitney U test) revealed,  $Z = 3.12$ ,  $p < 0.001$ , that subjects ( $n = 26$ ) who almost always experience orgasm during intercourse reported significantly more sexual arousal ( $\bar{x} = 4.65$ ,  $SD = .98$ ) than subjects ( $n = 21$ ) who almost never experience orgasm during intercourse ( $\bar{x} = 3.52$ ,  $SD = 1.19$ ).

A last result worth mentioning is that subjects who had never seen an erotic film before ( $n = 15$ ) showed higher mean genital responses ( $\bar{x} = 9.11$ ,  $SD = 5.35$ ) than subjects ( $n = 32$ ) who had seen one or more erotic films before participation ( $\bar{x} = 5.93$ ,  $SD = 5.28$ ), Mann-Whitney U test,  $Z = 2.26$ ,  $p < 0.03$ . Experience with erotic films was equally divided between film order groups. Only subjects who first saw the man-made film accounted for this significant result,  $Z = 2.20$ ,  $p < 0.03$ . Differences disappeared on the second film presentation. For those subjects who saw the woman-made film first no differences emerged.

## DISCUSSION

### Is a Woman-Made Film More Exciting for Women?

When women look at a woman-made film, as compared to looking at a man-made film, they report more positive affect, less negative affect, and more subjective sexual excitement. Vasocongestive genital arousal did not differ between films, although genital response to both films was substantial. This main effect of film content, differentiating between films, is a very clear one. No other variable contributed in a significant way to explain the variance in dependent variables.

Our results confirmed earlier suggestions about the co-occurrence of positive affect and subjective sexual arousal (e.g., Barlow, 1986). The increase in subjective sexual arousal related to the woman-made film seems to be elicited by the specific film content and the meaning it conveys, and not by a specific contribution of increased peripheral (genital) feedback. Although the woman-made film elicited more positive affect, Barlow's hypothesis that positive affect would increase genital vasocongestion was not supported. Positive affect co-occurred with higher subjective sexual excitement, but did not

evoke higher genital responses. Subjective sexual excitement was not systematically related to changes in genital vasocongestion. Thus, a woman-made film might be more sexually exciting for women when considering subjective responses, but not when genital responses are considered.

In a comparison of male- or female-initiated, and male- or female-centered audiotapes, Heiman (1977) found significant differences on the genital measure. For female subjects, the female-initiated, female-centered tape was most arousing. The fact that we did not find these differences may be attributed to stimulus intensity. Film, as a stronger sexual stimulus than audiotape, overrides the differences between excerpts, at least for genital arousal. Heiman did not provide data on subjective experience of sexual arousal.

We speculate that the largest contribution to female sexual excitement results from the processing of stimulus-content/meaning and not from peripheral vasocongestive feedback, since differences are found for subjective response that cannot be explained by differential genital response. Of course, while this may be true for the effects of visual stimuli or erotic imagery, it may not apply to tactile or other stimuli.

This observation is relevant for queries about which data system (subjective experience of sexual arousal; genital vasocongestion or behavior) defines sexual response (Rosen and Beck, 1988). Among the patterns we observed in response to man-made films there was a typical one: substantial genital vasocongestion paired with negative affect and low subjective sexual excitement. Although these discrepancies between response systems are often found, we agree with Rosen and Beck that primacy should be given to subjective experience. The rationale for this decision is that subjective experience is the proper reflection of an individual's concerns and self-determination. Further, in cases of (violent) sexual abuse allegations of consent proven by physiological signs alone will be prevented and dismissed as nonsensical.

### **Why Is There a Difference Between Subjective Responses and Not Between Vasocongestive Responses?**

The finding that vasocongestive responses varied less across film order and film content than subjective responses was not expected. The significant variation in subjective responses might be an effect of so-called regulation processes (Frijda, 1986) related to voluntary facilitation and inhibition of the sexual response. To accommodate regulatory processes we adhere to cognitive emotion theory (Everaerd, 1993). It is implied in this theory that stimuli are (cognitively) transformed into messages that eventually result in sexual response. Thus, a stimulus is not intrinsically sexual, it becomes

sexual by its transformation, which may in turn depend upon circumstances or a subject's history. Once response systems (vasocongestion and subjective experience of sexual arousal) are activated the subject reacts to this activation, which in turn (by regulation) may boost or inhibit response. We presume that this regulatory effect has taken place specifically for subjective responses, since they are by definition under conscious cognitive control. Although no significant interaction of Film Content  $\times$  Film Order was found, visual inspection of Fig. 1 reveals that differences in subjective responses between man-made and woman-made film excerpts when presented second contributed most to the film content effect. These differences in subjective responses to the man-made and the woman-made film point to contrasts between films as a possible source of regulation. Next to content proper of one film, contrast with content of another film may sharpen the appraisal of likes and dislikes. Had we run this study as a between-subjects design this regulation phenomenon would not have been visible.

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