

## A Comparison of Male and Female Patterns of Sexual Arousal

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*The structural patterns of sexual arousal are examined for eight male and eight female heterosexuals. Comparisons are made in terms of physiological and subjective arousal. The results indicate (1) that males and females differ in both the direction and magnitude of their arousal response to a variety of erotic stimuli and (2) that there is a stronger correspondence between subjective and physiological measures of sexual arousal for males than for females. A social acceptability and/or unacceptability theory is suggested to account for similarities and differences between the male and female structural patterns of arousal. Several methods of assessing subjective arousal are included to represent those most frequently used in clinical research settings. It is demonstrated that each of the subjective measures discriminates between erotic conditions and that the information provided by each of the measures are comparable.*

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## INTRODUCTION

The belief that males and females differ in their sexual responsivity to erotic stimulation has a long history in Western cultures. Freud's repression and drive models of sexuality contributed to differential expectations regarding male and female sexual arousal and sexual behavior. Kinsey and his colleagues' (1948, 1953) observation that males and females differ in their reaction to visual erotic stimuli lent anecdotal support to the belief in gender-specific differences. More recently, however, Schmidt (1975) has suggested that differences in sexual behavior patterns of males and females have diminished.

With the development of objective measures of genital arousal for both males (Freund, 1957; Barlow *et al.*, 1970) and females (Geer *et al.*, 1974), reports of investigations of sexual arousal in various populations have begun to appear. Researchers have studied the sexual arousal of heterosexual males and females (Steele and Walker, 1974; Wincze *et al.*, 1977; Sanford, 1974; Hoon and Hoon, unpublished manuscript; Heiman, 1978), homosexual males (McConaghy, 1969; Mavissakalian *et al.*, 1975; Conrad and Wincze, 1976), sexually dysfunctional females (Wincze *et al.*, 1976), and transsexual males (Barr and Blaszcynski, 1976; Barr *et al.*, 1974). Although the studies cited above were not designed to look specifically at gender differences, taken together, the results provide preliminary support for the hypothesis of gender-specific differences in terms of differential sexual responsivity to varying erotic content.

As Barlow (1977) points out, a thorough assessment of sexual arousal should include the measurement of genital arousal as well as the subjective experience of arousal. Unfortunately, of the studies cited above, only the Wincze *et al.* (1977) study included both continuous subjective and continuous genital measures. Although Steele and Walker (1974) and Heiman (1978) examined both male and female arousal, they used only subjective measures or continuous genital measures and discrete post hoc measures of subjective arousal, respectively. The methodological variation across studies makes it difficult to compare results.

For the purpose of this study, structural patterns of sexual arousal can be defined as characteristic responses in direction and magnitude as a function of varying erotic stimulus content (Katchadourian and Martin, 1979). It is hypothesized that structural patterns of sexual arousal can vary as a function of gender and sexual orientation. Data supporting or refuting the existence of characteristic patterns of sexual responding would provide important information regarding the parameters of sexual arousal relevant for the assessment and treatment of a variety of sexual disorders.

Because the sexual response involves cognitive changes as well as physiological changes it is important to look at both of these response

domains when assessing male and female similarities and differences. Throughout the literature, physiological sexual arousal has been narrowly defined in terms of genital changes. In fact, the primary focus of much of the research cited above has been on genital arousal. In contrast, subjective arousal has a far broader definition. To date, there is no agreed-upon subjective measure of sexual arousal. Indeed, subjective measures might be assessing a very different, though equally important, aspect of the human sexual response. One of the purposes of this study is to evaluate the correspondence between the measures of subjective arousal frequently used in research and clinical settings.

Second, this study provides a comprehensive description of the structural patterns of sexual arousal of heterosexual males and females by continuously and concurrently measuring subjective as well as physiological response systems. Because sexual arousal is a multidimensional response, the structural patterns of arousal described include genital and subjective responses, as well as the relationship between the two.

In summary, the purposes of this study are (1) to examine the relationship between continuous physiological and subjective estimates of arousal, (2) to provide a comprehensive description of the structural patterns of sexual arousal in heterosexual males and females, and (3) to evaluate the relative efficacy of a variety of measures of subjective arousal frequently used in research and clinical settings.

## METHOD

### Subjects

Eight heterosexual male and eight heterosexual female volunteers were each paid \$10 for their participation in the study. Subjects were graduate and undergraduate students between the ages of 19 and 30 ( $\bar{X}$  male = 22 yrs,  $\bar{X}$  female = 23 yrs); one male subject and one female subject were married. Each potential subject was rated by an experienced clinician on the Kinsey Scale (Kinsey *et al.*, 1948). Only those receiving a score of 0, indicating exclusive heterosexual sexual orientation, were included in the study. Each subject was interviewed prior to the experimental session to insure the absence of sexual dysfunction, emotional disturbance, or an aversion to explicit sexual material. Each subject was asked to complete a series of questionnaires designed to obtain descriptive background information. The questionnaires included the Bem (1974) Sex-Role Inventory, Bentler's Scales of Heterosexual Behavior Experience (1968a, b), the Sexual Arousability Inventory (Hoon, Hoon, and Wincze,

1976), and a confidential information form. Responses on these questionnaires were reviewed to determine any potential sampling biases. Both the males' and the females' BEM Scores suggest that they have more androgynous sex role attitudes than one would expect of the general population. The males and females who participated in the study reported comparable sexual experience and sexual arousability on their background questionnaires.

### Measures

Both continuous and discrete measures of subjective and physiological arousal were recorded.

#### *Physiological Measurement*

The Geer *et al.* (1974) vaginal photoplethysmograph transducer (probe) was used to measure vaginal vasocongestive changes on the surface of the vaginal wall for the female subjects. The vaginal probe was connected to the polygraph using a Grass Model 70816 connecting cable. Sensitivity of the preamplifier was set at 0.01 mv/cm for all subjects. The AC signal recorded changes in light reflected from the vaginal wall. The AC signal was integrated using a Grass Model 7p3 integrator.

A penile strain gauge (Barlow *et al.*, 1970) was used to measure changes in penile tumescence for the male subjects. The penile strain gauge was connected to the polygraph with a Grass Model 50815 connecting cable. Preamplifier sensitivity was set at 0.05 mv/cm for all subjects. A continuous DC signal recorded changes in electrical output caused by expansion of the strain gauge.

#### *Subjective Measurement*

A continuous measure of subjective arousal was recorded for all subjects using a movable lever that yielded a continuous DC signal on the polygraph (Wincze *et al.*, 1977). The mechanical lever swung through a 90-degree arc with a scale calibrated from 0 to 10. Electrical output changed as a function of the location of the lever in its range.

Two additional discrete measures of subjective arousal were collected. One minute after the conclusion of each stimulus presentation, each subject was asked to report verbally on a scale from 0 to 100, "Overall, how sexually aroused did you feel during the film which you just viewed?" This rating is similar to the subjective measure frequently used by other

researchers (Henson *et al.*, 1977; Heiman, 1978). During the debriefing that followed the entire experimental session, each subject was asked to rate his or her arousal during each of the stimulus films, in retrospect. This rating is similar to the subjective report of sexual arousal an individual is asked to give in clinical interviews.

Following the procedure described by Mavissakalian *et al.* (1975), attitudinal ratings of "pleasantness" were collected using a seven-point Likert scale following each stimulus presentation.

### Experimental Room

The laboratory consisted of two adjacent rooms. The subject room was sound attenuated and temperature controlled. This room housed a large reclining subject chair, the subject lever to be used by the subject to estimate arousal, and a television monitor for presenting the stimulus films. The subject room was connected to the adjacent experimental room by an intercom system that allowed the subject and experimenter to communicate during the experimental session.

Presentation of the stimulus films was controlled from the experimental room on a video cassette recorder. The output from the subjective and physiological measures was recorded on a Grass Model 7D Polygraph, which was also housed in the experimental room.

### Experimental Design

A multigroup multifactor 6 X 5 repeated-measures design was employed. Group 1 consisted of eight heterosexual females, group 2 of eight heterosexual males. The first factor was stimulus content, which consisted of six 4-minute experimental conditions. The six conditions were (1) no film, baseline, (2) a neutral film portraying scenes of the coast of Nova Scotia, (3) a heterosexual activity film, a male-female couple engaging in explicit sexual activity, (4) a male homosexual activity film, two males engaging in explicit sexual activity, (5) a lesbian activity film, two females engaging in explicit sexual activity, and (6) a group sex film, a group of males and females engaging in explicit sexual activity. Previous research (Wincze *et al.*, 1977; Hoon, Wincze, and Hoon, 1976; Mavissakalian *et al.*, 1975) has demonstrated that films representing these content areas reliably produce changes in male and female arousal responses. However, these studies have not assessed males and females within the same research paradigm. The second factor was a time factor, which consisted of five 20-second intervals for each of the sex stimulus conditions. The films were presented in a predetermined counterbalanced order.

The dependent measures included (1) continuous genital measure (strain gauge or vaginal probe), (2) continuous subjective estimate of arousal using the hand lever, (3) subjective discrete rating of arousal taken 1 minute following each film sequence, (4) subjective rating of pleasantness taken 1 minute following each film sequence, and (5) discrete postexperimental ratings of subjective arousal taken during the debriefing period.

## PROCEDURE

Each subject participated individually. The physiological measures and the continuous subjective measure were explained by a same-sex investigator who then left the room. At this time, the female subjects inserted the probe and the male subjects placed the strain gauge. Female subjects were instructed to insert the probe with the light emitting diode facing the anterior aspect of the vaginal wall. Male subjects were instructed to place the strain gauge 1 cm from the base on the dorsal aspect of the penis.

When the subject signaled that the transducer had been attached, the same-sex investigator reentered the room and checked to insure proper placement. A permanent mark on the extruding cable of the vaginal probe enabled the female investigator to check both the direction and depth of probe insertion.

Each subject was told that, throughout the entire experimental session, he or she should continuously monitor his or her subjective feelings of arousal using the lever. Each subject was instructed to practice using the lever and was told that 0 meant absolutely no feelings of arousal and 10 the maximum arousal possible. Each subject was then told that, following each film sequence, he or she would be asked to rate the degree of "pleasantness" and his or her overall level of sexual arousal during the preceding film.

Following a 15-minute adaptation period, the word *relax* appeared on the screen, followed by a travelogue sequence. These stimuli were each presented for 2 minutes to control for the orienting response. Upon offset of the travelogue, each of the 5 experimental stimuli were presented and then withdrawn in a predetermined counterbalanced order. Between each stimulus presentation, there was a 3-minute or return-to-baseline intertrial interval.

Immediately following the experimental session, each subject was debriefed. At this time, the subjects were asked to rate on a scale from 0 to 100 how sexually aroused they felt during each film sequence. Subjects were also asked to respond to a series of questions pertaining to their reactions to the films, their ability to concentrate, their use of the subjective lever, and their expectancy.

### Data Sampling

Physiological and subjective arousal data were sampled every 20 seconds across the baseline and stimulus presentation periods. This produced a total of 30 data points per measure per subject. The female probe signal was integrated using a Grass 7p3 Integrator. Changes in the amplitude of the signal reflected changes in the sexual response. Each data point was reported as distance in millimeters from a zero baseline. Differences between basal measures and evoked measures provided indices of change in sexual responding. By calculating differences between basal physiological and evoked physiological measures, the experimenter was able to control for between-subject differences in resting baseline.

The linear output produced by the subjective lever provided measures of pen deflection, where each 5-mm increment represented one scale point on the subjective lever. Subjective ratings ranged from 0, no arousal, to 10, maximum arousal. All data were reduced by hand. Reliability was calculated by having a second rater score 10% of the data for each dependent measure. Reliability was found to exceed 0.99.

## RESULTS

Separate two-way ANOVAs with repeated measures on the second factor were computed for the male and female data. Analyses were performed for the male penile circumference data, the female vaginal vasocongestion data, and the continuous subjective-arousal data (subjective lever) for both groups. The first factor was a condition factor that consisted of six levels representing each of the 4-minute experimental conditions: baseline, neutral, heterosexual, male homosexual, lesbian, and group sex. The second factor was a time factor that consisted of five 20-second intervals for each of the six experimental conditions.

### Male Physiological Measure

Significant main effects for stimulus film condition,  $F(7, 35) = 11.93$ ,  $p < 0.001$ , for time,  $F(7, 28) = 9.53$ ,  $p < 0.001$ , and for the interaction of condition by time,  $F(7, 140) = 21.0$ ,  $p < 0.01$ , were found for the male penile circumference data. In order to interpret the interaction, simple effects tests were performed for experimental conditions at each of the five levels of time. Significant differences ( $p < 0.01$ ) were found between stimulus conditions at each of the levels of time. In order to determine the source of these significant differences, Newman-Keuls tests were performed at each level of time. This Analysis indicated that, at time 1,

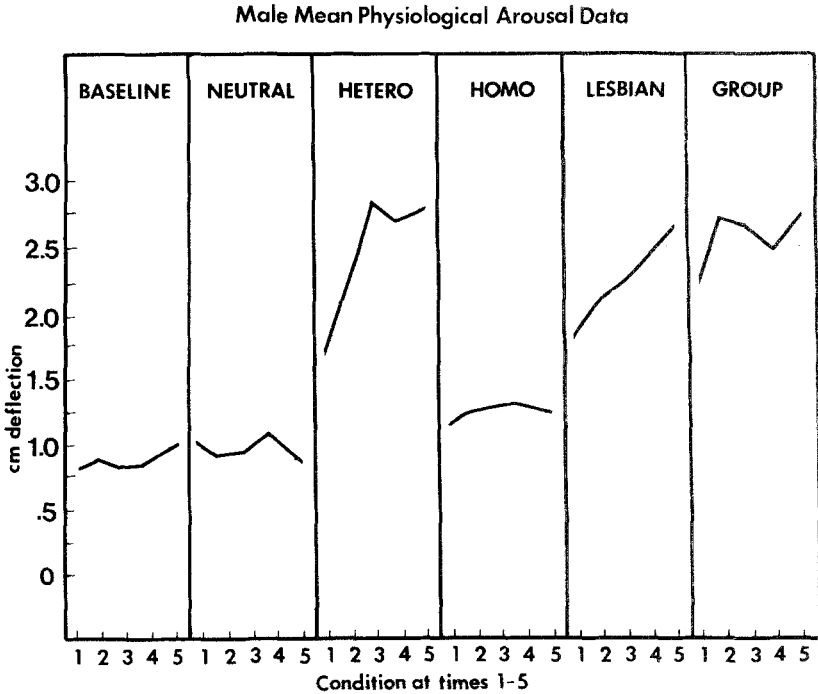


Fig. 1. Male patterns of physiological sexual responding, as measured by the strain gauge, are illustrated as a function of time for each of the stimulus film presentations.

the baseline condition produced significantly ( $p < 0.01$ ) less change in penile circumference than the group sex film. For stimulus condition at times 2, 3, 4, and 5, the analysis indicated that the baseline, neutral, and male homosexual conditions produced significantly less change in penile circumference than did the heterosexual, lesbian, and group conditions. Figure 1 illustrates that the males experienced the greatest magnitude of physiological arousal in the presence of the group sex, lesbian, and heterosexual films, in that order.

### Female Physiological Measure

Results of the analysis of the female vaginal vasocongestion data indicate a significant main effect for stimulus film condition,  $F(7, 35) = 2.81$ ,  $p < 0.03$ , but no significant effects for time or the interaction of condition and time. In order to interpret the source of differences between stimulus conditions, a Newman-Keuls analysis was done. Results of this analysis indicate that the neutral and baseline conditions produced signif-



icantly ( $p < 0.01$ ) less change in vaginal vasocongestion than did the heterosexual and group film conditions. No significant differences between the baseline, neutral, male homosexual, and lesbian conditions were found. Figure 2 illustrates that the greatest magnitude of physiological arousal for the females was recorded during the group sex and heterosexual activity films.

**Male Subjective Measure**

Significant main effects for condition,  $F(7, 35) = 13.42, p < 0.001$ , time,  $F(7, 28) = 7.09, p < 0.001$ , and a significant interaction,  $F(7, 140) = 5.3, p < 0.001$ , were found for the males' subjective estimates of sexual arousal. Interpretation of the interaction indicated significant ( $p < 0.01$ ) effects for film condition at each of the levels of time. Results of this analysis indicate that for condition at time 1, the baseline, neutral, and male homosexual conditions produced significantly ( $p < 0.01$ ) less reported subjective arousal than did the lesbian condition. At times 2, 3, 4, and 5,

Female Mean Physiological Arousal Data

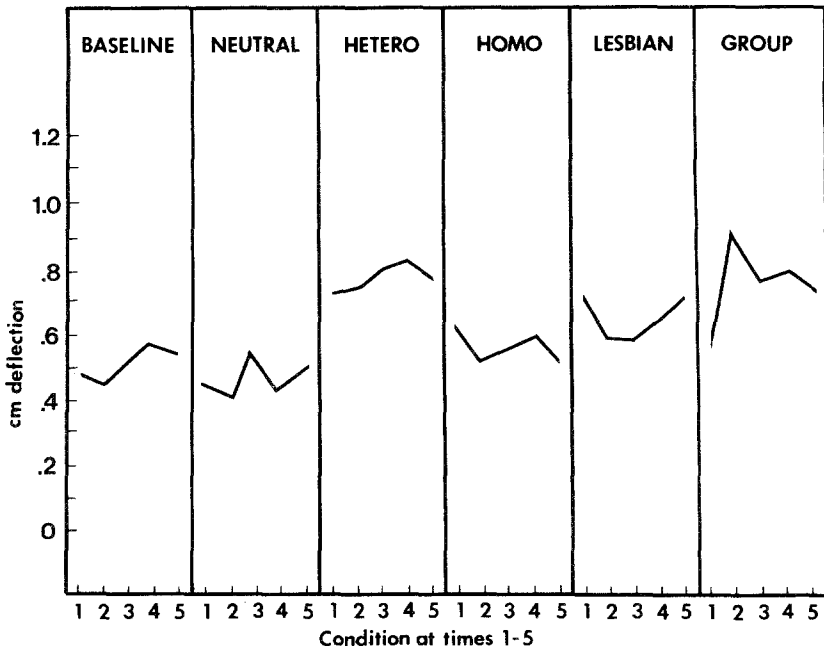


Fig. 2. Female patterns of physiological sexual responding, as measured by the vaginal plyphesmograph, are illustrated as a function of time for each of the stimulus film presentations.

significantly ( $p < 0.01$ ) less subjective arousal was reported during the baseline, neutral, and male homosexual conditions than during the heterosexual, lesbian, and group film conditions. In addition, at time 4, the heterosexual and lesbian films produced significantly ( $p < 0.01$ ) less subjective arousal than did the group sex film. Figure 3 illustrates that the males reported the greatest magnitude of subjective arousal while viewing the group sex film, followed by the lesbian and heterosexual films.

### Female Subjective Measure

Analysis of the female subjective arousal data revealed significant main effects for condition,  $F(7, 35) = 6.25, p < 0.001$ , time,  $F(7, 28) = 5.77, p < 0.002$ , and their interaction,  $F(7, 140) = 2.13, p < 0.006$ . Simple effects tests were performed to interpret the interaction, the results of which show significant ( $p < 0.01$ ) effects for film condition at times 2, 3, 4, and 5. To determine the source of these differences, Newman-Keuls tests for

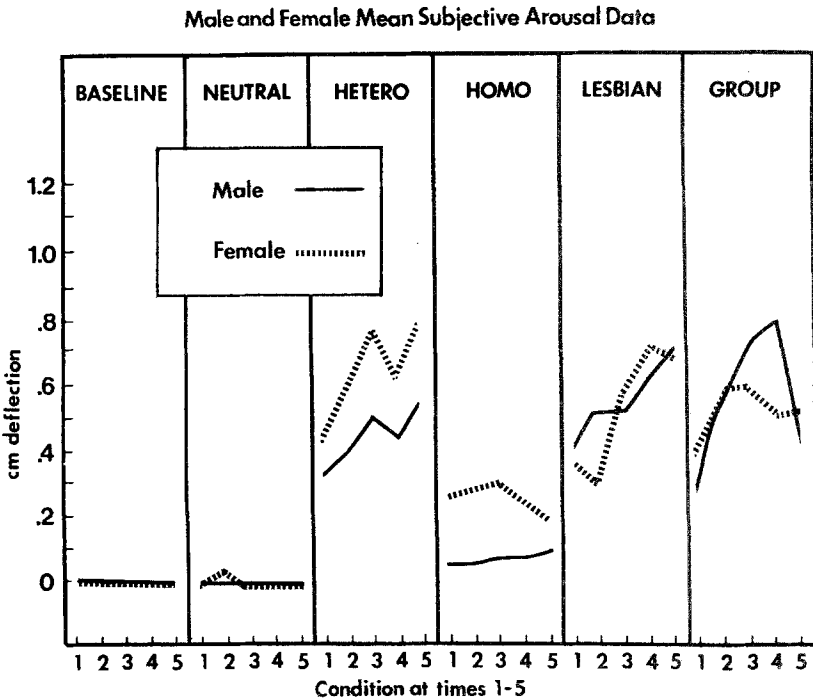


Fig. 3. Male and female patterns of subjective sexual responding, as measured by the subjective lever, are illustrated as a function of time for each of the stimulus film presentations.

condition at these times were performed. Results of these analyses indicate that for film condition at time 2, the baseline and neutral conditions produced significantly ( $p < 0.01$ ) less reported subjective arousal than did the group and heterosexual films. At times 3, 4, and 5, there was significantly ( $p < 0.01$ ) less reported subjective arousal during the baseline and neutral than during the lesbian, group, and heterosexual films. At times 3 and 5 there was significantly ( $p < 0.01$ ) less subjective arousal during the homosexual than during the heterosexual film. At times 5 there was less reported subjective arousal recorded under the homosexual than under the lesbian condition. Figure 3 illustrates that the females reported being the most subjectively aroused during the heterosexual activity film.

### **Relationship between Continuous Physiological and Subjective Measures**

Pearson-Product Moment correlation coefficients were computed for each subject's physiological and continuous subjective data.

A significant relationship was found between the penile circumference and continuous subjective lever arousal data for each of the eight male subjects. The correlations ranged from  $r = 0.68$  to  $r = 0.09$  ( $p < 0.01$ ).

A significant relationship ( $p < 0.01$ ) between the vaginal vasocongestion and continuous subjective measure of sexual arousal was found for five of the eight female subjects. The correlations ranged from  $r = 0.38$  to  $r = 0.76$ .

### **Intercorrelations between Discrete and Continuous Subjective and Physiological Measures**

Correlation matrices, using the Pearson product moment correlation coefficient, were computed separately for the male and female grouped data. The measures included in this analysis were the following:

1. The subjective estimate of arousal taken 1 minute following the the end of each film sequence (SA-1 Min)
2. The subjective estimates of arousal for each film sequence taken during the debriefing period (SA-Post)
3. The mean value of the continuous measure of subjective arousal for each film sequence as measured by the subjective lever ( $\bar{X}$ -Cont SA)
4. The maximum value recorded for the continuous measure of subjective arousal for each film sequence (Max-Cont SA)
5. The "pleasantness" rating recorded 1 minute following the offset of each film sequence

6. The mean value of penile circumference for each film sequence (male subjects) ( $\bar{X}$ -PC)
7. The maximum value of penile circumference (male subjects) Max-PC)
8. The mean value of vaginal vasocongestion for each film sequence (female subjects) ( $\bar{X}$ -VV)
9. The maximum value of vaginal vasocongestion for each film sequence (female subjects) (Max-VV).

### *Males*

The correlation matrix for the group of male subjects is presented in Table I. The subjective estimate of arousal taken 1 minute following film offset provided a more valid estimate ( $r = 0.92$ ) of Max-PC than did either the  $\bar{X}$ -Cont SA ( $r = 0.84$ ) or the Max-Cont SA ( $r = 0.84$ ) subjective measures. This pattern was also observed when comparing the SA-1 Min, the  $\bar{X}$ -Cont SA, and the Max-Cont SA estimates to the  $\bar{X}$ -PC data. The SA-1 Min estimate had a stronger relationship ( $r = 0.86$ ) to the  $\bar{X}$ -PC measure than either of the continuous subjective measures ( $r = 0.80$ ,  $r = 0.80$ , respectively).

The SA-Post had a strong relationship with both the  $\bar{X}$ -PC measure ( $r = 0.80$ ) and the Max-PC measure ( $r = 0.87$ ). It was found that both of the discrete measures of subjective arousal (SA-1 Min and SA-Post) were better estimates of Max-PC ( $r = 0.92$  and  $r = 0.87$ , respectively; than of  $\bar{X}$ -PC ( $r = 0.86$  and  $r = 0.80$ , respectively).

A strong correlation ( $r = 0.96$ ) was found between the SA-1 Min rating and the pleasantness rating. The pleasantness rating was more strongly related to both of the Cont SA measures ( $r = 0.83$  and  $r = 0.85$ ) than to either of the penile circumference measures ( $r = 0.60$  and  $r = 0.66$ ). All of the correlations reported for the male group were significant at the 0.01 level.

### *Females*

The correlation matrix for the group of female subjects is also presented in Table I. The strongest relationship between objective and subjective measures of arousal was found between the Max-VV and Max-Cont SA measures ( $r = 0.62$ ,  $p < 0.01$ ). Significant relationships were also found between the Max-VV and  $\bar{X}$ -Cont SA measure ( $r = 0.58$ ,  $p < 0.05$ ) and the Max-VV and SA-1 Min estimate ( $r = 0.58$ ,  $p < 0.05$ ). No significant relationship were found between the  $\bar{X}$ -VV measure and any of the subjective measures.

Table I. Correlations among Male (m) and Female (f) Groups' Measures of Sexual Arousal

	$\bar{X}$ -PC (m)	$\bar{X}$ -VV (f)	$\bar{X}$ -Cont SA	SA-I Min	SA-Post	Pleasantness	Max-PC (m)	Max-VV (f)
$\bar{X}$ -Cont SA	.80 <sup>b</sup> (m)							
	.482 (f)							
SA-I Min	.80 <sup>b</sup> (m)	.94 <sup>b</sup> (m)						
	.517 (f)	.905 <sup>b</sup> (f)						
SA-Post	.80 <sup>b</sup> (m)	.92 <sup>b</sup> (m)	.96 <sup>b</sup> (m)					
	.494 (f)	.873 <sup>b</sup> (f)	.957 <sup>b</sup> (f)					
Pleasantness	.60 <sup>b</sup> (m)	.83 <sup>b</sup> (m)	.96 <sup>b</sup> (m)	.85 <sup>b</sup> (m)				
	.397 (f)	.383 (f)	.363 (f)	.454 (f)				
Max-PC (m)	.95 <sup>b</sup> (m)	.84 <sup>b</sup> (m)	.92 <sup>b</sup> (m)	.87 <sup>b</sup> (m)	.66 <sup>b</sup> (m)			
Max-VV (f)	.821 <sup>b</sup> (f)	.576 <sup>a</sup> (f)	.581 <sup>a</sup> (f)	.498 (f)	.375 (f)			
Max-Cont SA	.80 <sup>b</sup> (m)	.95 <sup>b</sup> (m)	.96 <sup>b</sup> (m)	.95 <sup>b</sup> (m)	.85 <sup>b</sup> (m)	.84 <sup>b</sup> (m)		
	.511 (f)	.977 <sup>b</sup> (f)	.928 <sup>b</sup> (f)	.883 <sup>b</sup> (f)	.339 (f)	.618 <sup>b</sup> (f)		

<sup>a</sup> $r > 0.529, p < 0.05$ .

<sup>b</sup> $r > 0.595, p < 0.01$ .

Both of the discrete subjective estimates (SA-1 Min and SA-Post) were more strongly related to the Max-Cont SA measure ( $r = 0.93$  and  $r = 0.88$ , respectively) than to the  $\bar{X}$ -Cont SA measure ( $r = 0.91$  and  $r = 0.87$ , respectively). The discrete 1-minute arousal estimate was significantly ( $p < 0.05$ ) relate to the Max-VV measure ( $r = 0.58$ ) but not to the  $\bar{X}$ -VV measure.

## DISCUSSION

### Male and Female Structural Patterns of Sexual Arousal

When discussing these results, it is important to keep in mind that although it is valid to make direct comparisons between the male and female groups in terms of their subjective estimates of arousal, this is not so with regard to physiological arousal. Measures of penile circumference and vaginal vasocongestion are not directly comparable, and, in fact, the range of change discriminable by these measures is different. In this research, the range of circumference change for males experiencing moderate sexual arousal varied up to 2 cm of pen deflection on the polygraph. Vasocongestive changes on the order of 2 to 4 mm of pen deflection were observed for females experiencing moderate levels of sexual arousal. With this in mind, the remainder of the discussion will compare males and females in terms of their structural patterns of arousal, not absolute amounts of change.

The results suggest that when heterosexual males and females view a variety of erotic film sequences they have discriminably different genital arousal patterns in reaction to these films. For both males and females, the erotic films produce more sexual arousal than a neutral film. The males displayed the greatest magnitude of physiological arousal in the presence of group sex and lesbian activity films. The greatest magnitude of physiological arousal for the females occurred during the group sex and heterosexual activity films.

For the males, high levels of physiological arousal occurred in the presence of opposite-sex homosexual activity (lesbian film); but, for the females, the lowest magnitude of sexual arousal occurred during the presentation of the opposite-sex homosexual activity film (male homosexual film). For both the males and females, the greatest overall group mean values of physiological arousal were observed during the group sex film, replicating the findings of Sintchak and Geer (1975), and Hoon, Wincze, and Hoon (1976).

An interesting finding is that the film depicting male homosexual activity was the least physiologically and subjectively arousing erotic film for both the males and females. This provides the clearest support for

the Kinsey *et al.* (1953) report that neither heterosexual males nor females become erotically aroused in the presence of male homosexual activity but that males do become erotically aroused when viewing two females engaged in sexual activity. On the basis of self-report measures, Schmidt (1975) suggests that both males and females report more arousal to female masturbation than to male masturbation. Mosher and O'Grady (1979) report that their heterosexual male subjects reported no or very little subjective arousal following exposure to films depicting male masturbation and male homosexual activity, respectively. The current study provides physiological data that tends to support Schmidt's and Mosher and O'Grady's reports.

The males in this study reported high levels of subjective arousal in the presence of the group sex, lesbian, and heterosexual films, in that order. By contrast, the females reported the greatest overall magnitude of subjective arousal during the heterosexual film, followed by the lesbian and group sex films. Neither the males nor the females reported any significant subjective arousal during the male homosexual film sequence. Because the females reported more arousal during the lesbian film, these data do not support Schmidt's (1975) suggestion that both males and females report less arousal to same-sex than opposite-sex stimuli. These data also argue against Morin and Garfinkle's (1978) suggestion that males are more adversely affected by male homosexuality than are females.

### **Relationship between Physiological and Subjective Measures**

Conflicting reports regarding the relationship between subjective and physiological measures of sexual arousal have appeared (Geer *et al.*, 1974; Wincze *et al.*, 1977; Heiman, 1975, 1978; Henson *et al.*, 1977; McConaghy, 1969; Mavissakalian *et al.*, 1975). Overall, the literature suggests that for most males there is relatively strong correspondence between physiological and subjective measures of sexual arousal but that this relationship is far more variable for females. The results of the present investigation support these findings.

Indeed, differences both in the structural patterns of sexual arousal and the relationship between subjective and physiological measures of sexual arousal were observed for these groups of males and females. One way in which these differences can be explained is in terms of a model of social acceptability and/or unacceptability. In a theoretical discussion of sexual excitement, Stoller (1976) suggests that partial social taboos can enhance sexual excitement by adding the expectancy of pleasure coupled with moderate risk. According to Sigusch *et al.* (1970), sexual stimuli that are rated as being somewhat "unfavorable" are also rated as being more arousing. If this is the case, it can be speculated that there exists some

socially defined spectrum of socially acceptable and socially unacceptable behaviors and that the level of social acceptability or unacceptability interacts with a particular behavior's arousability function. It is possible that there is some optimal level of social unacceptability (norm breakingness, novelty, risk) for facilitating sexual arousal and that anything exceeding this level can be considered deviant and nonarousing. Again, as Stoller (1976) suggests, the absence of all risk might lead to boredom and inhibition of arousal; the presence of extreme risk might also inhibit arousal.

In this study, the group sex film might fall within the range of social unacceptability that enhances arousal (moderate risk), explaining the highly arousing function of this film for both groups of subjects. On the other hand, the male homosexual film might be extremely taboo and outside of this range for these subjects and, consequently, would take on a nonarousing function. As Kinsey and his colleagues (1953) point out, male homosexual behavior has a long history of social condemnation. More recently, Morin and Garfinkle (1978) have suggested that although, in general, cultural condemnation of homosexuality has diminished, heterosexual males might still tend to view male homosexuality as a personal threat. In a study of male affective responses to visual erotic stimuli, subjects in Mosher and O'Grady's (1979) study reported feelings of disgust, anger, and shame associated with the viewing of male homosexual sex. Perhaps the history of strong negative social sanctions, coupled with the associated negative affect, leads heterosexual individuals to label male homosexual behavior as deviant and nonarousing.

The highly arousing function of the lesbian film for the males is also interesting in light of this discussion. Although lesbianism is not a socially sanctioned behavior, it has not been devalued to the same extent as male homosexual behavior (Kinsey *et al.*, 1953). To the extent that lesbian behavior can be considered norm breaking rather than deviant, it is possible that lesbian activity falls within the range of social unacceptability that facilitates sexual arousal for heterosexual males and females. These data lend support to Mosher and Abramson's (1977) observation that both males and females report heightened levels of subjective arousal following exposure to female masturbation stimuli.

Social acceptability and/or unacceptability might also begin to explain differences between these groups of males and females in terms of the relationships between their subjective and physiological measures. It is widely accepted that, typically, males and females receive differential social reinforcement for identifying and expressing their sexual interests (Gagnon and Simon, 1973). The males, for whom these two measures were strongly related, typically have received positive social sanctions for identifying and expressing their sexual arousal. Most often this is not the case for females.



In a study of bisexuality in women, Blumstein and Schwartz (1976) discuss the importance of social influences on both sexual behavior and subjective description of sexual preferences. They note that individuals tend to develop ideologies that justify their sexual behavior and attitudes and that conform to their environment. It is possible that the variable relationship between the physiological and subjective measures of sexual arousal for the heterosexual females in this study is, in part, due to social influence on their subjective report. This could account for the discrepancy between the females' subjective reports of arousal and the measures of physiological arousal while viewing the group sex film. It is possible that the females considered the group sexual activity to be more socially taboo than the heterosexual activity and, therefore, tended to estimate their subjective arousal in the direction they assumed was more socially acceptable. This explanation is consistent with the statement of Sigusch *et al.* (1970) that social and sex role expectations directly influence emotional behavior.

In addition to the social acceptability and/or unacceptability hypothesis, several alternative explanations should be considered when evaluating these results. The effect of expectancy on both physiological and subjective report of arousal might be different for these groups of subjects. Males and females might have differential abilities to discriminate the presence of sexual arousal. Indeed, the degree of erection might provide a male with direct feedback regarding this level of arousal (Heiman, 1978). Finally, the characteristics of the particular film sequences used should be considered.

### **A Comparison of Measures of Subjective Arousal**

Very strong relationships were found between all four subjective estimates of arousal for the males and females studied. For the males, the two discrete measures provided better estimates of physiological arousal than did the continuous measures. Interestingly, this was not true for the females. The continuous measures proved to be better estimates of their physiological arousal. Although no relationship was found between ratings of "pleasantness" and ratings of subjective arousal for the females, strong relationships between these measures were found for the males. Instructions for the discrete ratings asked the subject to give his or her "overall" estimate of arousal. It is interesting that the discrete subjective estimates of arousal correspond most strongly with maximum physiological arousal. It seems that when an individual is given somewhat vague instructions (e.g., rate your overall arousal), he or she is likely to report the highest level of arousal experienced. The importance of instructions should be

noted. It is possible that asking a subject to report average arousal or maximum arousal would lead to different results. As Mosher and Abramson (1977) point out, the method of assessing subjective arousal might significantly influence the results.

Overall, the comparison of the continuous and discrete subjective measures indicates that these four measures, frequently used in research and clinical settings, are roughly equivalent. Since the discrete and continuous measures appear to provide comparable information, it is suggested that a single postexperimental rating, which is the easiest to obtain, would be the measure of choice for most purposes. The continuous measure would be preferable for studying structural patterns of sexual arousal or for accumulating more data for correlational analysis.

## CONCLUSION

In conclusion, it seems that groups of heterosexual males and females differ both in the correspondence between their subjective and physiological measures of sexual arousal and in the direction and magnitude of their responsiveness to erotic material. Although the results of this study lend preliminary support to a theory of gender-specific differences regarding structural patterns of sexual responsivity, the small sample size limits the generalizability of the findings. Clearly, further research is needed to either support or refute the generality of these results across gender as well as sexual orientation.

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