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THE EFFECTS OF INDUCED DEPRESSION AND ELATION
ON RESPONSE TO EROTICA

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ABSTRACT

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Recent studies suggest that response to erotica is affected by mood and by individual differences in sexual attitudes and behaviors. In the present study, subjects viewed statements designed to produce either elated, depressed, or neutral mood prior to viewing an erotic film. The prior mood statements had no effect upon either subjective or physiological response to erotica. It seems likely that the statements failed to generate sufficiently strong mood states. With regard to individual differences in response to erotica, several sexual attitudes, behaviors, and demographic variables were assessed through questionnaires. These measures failed to predict physiological response to erotica, but were significantly related to subjective response to erotica. The Sexual Arousalability Inventory emerged as the single best predictor of subjective response to erotica, and is potentially a useful instrument for matching subjects in sex research. Sexual orientation, phase of menstrual cycle, frequency of masturbation, the Bentler Heterosexual Experience Scale, and frequency of sexual activity also contributed to the prediction of subjective response to erotica, while age and the Sex Guilt subscale of the Mosher Forced Choice Guilt Inventory added little to prediction.

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Dedication

To my grandmother, parents, and brother.

Human sexuality, an area traditionally surrounded by myths and taboos, has become an acceptable area for scientific enquiry within the past century. Freud (1905) was among the first to recognize the importance of sexual drives in personality development. Kinsey et al. (1953) conducted surveys in order to obtain normative data concerning North American sexual habits and preferences. Masters and Johnson (1966) studied the physiological aspects of sexuality by recording physiological changes during sexual activity in the laboratory. Response to erotica became a phenomenon of interest during the 1960's as a result of societal and governmental concern with allegedly harmful effects of pornography. An experimental paradigm in which subjects are exposed to psychosexual (nontactile) stimuli, which are generally presented through visual or auditory modalities, such as most forms of erotica, while subjective or physiological responses are assessed was developed in this context. Contemporary researchers have adapted this paradigm in order to study the role of various factors influencing sexual arousal. The present study will attempt to examine the effects of an experimental mood induction procedure as well as a number of individual difference factors on response to erotica in females.

From an evolutionary perspective, sexual arousal plays a vital role in reproduction and species survival. It is an important aspect of human experience, representing a source of emotional gratification and self-esteem for many

individuals. On an applied level, an understanding of sexual arousal has potential clinical applications for sex therapy. Disorders of sexual arousal are becoming increasingly recognized as a clinical problem (Kaplan, 1979). Further understanding of factors which increase and decrease sexual arousal might lead to improvements in treatment. On a theoretical level, understanding sexual arousal may have relevance for understanding other forms of arousal. Geer (1976) has argued that since sexual arousal may follow a pattern similar to other emotional states, studies of sexual arousal may contribute to the development of general theories of emotion. For these reasons, it seems important to examine factors which increase and decrease sexual arousal.

Sexual arousal, or momentary level of sexual excitement, has been conceptualized as a motivating factor for sexual activity (Whalen, 1966) and as an indicator of sexual interest (Griffitt, 1975). Like other emotional states, sexual arousal involves a subjective, cognitive aspect measurable through self-report and a physiological aspect. Hatch (1979) suggested that motoric components constitute a third dimension of sexual arousal. Perhaps sexual arousal can be distinguished from other emotional states in terms of its particular motivating effects on sexual behaviour, the qualitative aspects of cognitions present during sexual arousal, and the nature of the physiological and motoric components.

Sexual arousal involves a variety of physiological changes, including increases in heart rate, respiration and electrodermal activity, as well as genital responses such as vasocongestion. The latter mediates penile erection and vaginal lubrication and swelling. Many physiological responses occur in a variety of emotional contexts, creating difficulties in the interpretation of physiological data. For example, an increase in heart rate could presumably reflect sexual arousal, anger or fear. However, genital responses are specific to sexual arousal. They rarely occur in the context of nonsexual emotional states (Zuckerman, 1971). Geer (1976) has argued that genital responses are reliable concomitants of sexual arousal, as their occurrence is necessary for sexual activity to take place. These responses occur early in the sexual response sequence and are sensitive to low levels of sexual arousal (Masters and Johnson, 1966). The presence of the genital vasocongestive response to sexual stimuli and absence during other emotional states confers considerable discriminative power on measures of genital response. It may endow the study of sexual arousal with unique methodological advantages relative to other emotional states (Geer, 1976).

Genital vasocongestion lends itself easily to physiological measurement techniques, such as the penile strain gauge and the vaginal photoplethysmograph. The latter was originally developed by Sintchak and Geer (1975). It consists of a plastic tube containing a light source and

photocell, which measures light reflected from the vaginal walls. Since blood flow affects the amount of reflected light, the output of the photocell indicates the level of vaginal vasocongestion. Vaginal blood flow involves two components. Vaginal blood volume, a tonic response, reflects the accumulation of blood in the vagina. Vaginal pressure pulse, a phasic response, is a measure of momentary change in the amount of blood. Since the photoplethysmograph signal has not been calibrated in blood volume units, vaginal blood volume and pressure pulse are generally expressed as millimeters of polygraph pen deflection (Hatch, 1979).

A frequently employed experimental paradigm involves exposing subjects to erotica and assessing both subjective and physiological responses. This paradigm has been employed in assessing the effects of various stimulus dimensions, individual differences and experimental manipulations. The usefulness of this experimental paradigm in understanding sexual arousal seems to rest on several assumptions. One assumption involves the effectiveness of erotica in inducing sexual arousal. Studies focusing on stimulus dimensions which elicit sexual arousal (eg. Osborn and Pollack, 1977; Heiman, 1977) bear on this issue. Another assumption involves the validity of measures of sexual arousal. Studies comparing the effects of psychosexual stimuli and stimuli with nonsexual content on a variety of measures of sexual arousal (eg. Hoon, Wincze and

Hoon, 1976) are relevant to this assumption. A further assumption involves the ability to generalize findings regarding response to erotica in laboratory situations to sexual arousal in naturalistic sexual interactions between persons. Studies relating individual differences in response to erotica to various sexual attitudes and behaviours (eg. Griffitt, 1975; Mosher and Abramson, 1977) appear relevant to this issue.

A number of studies have examined dimensions of psychosexual stimuli which elicit sexual arousal. It has been repeatedly demonstrated that exposure to psychosexual stimuli produces sexual arousal on physiological and subjective measures in both males and females. In a study by Sigusch et al. (1970), response to erotic slides was assessed through ratings of sexual arousal, self-report of genital sensations, and self-report of sexual behaviour following the experiment. Increases were apparent on all three self-report measures, suggesting that the erotic slides produced sexual arousal in both males and females.

More recent studies employing physiological measures have found that the effectiveness of a psychosexual stimulus lies in its explicitness rather than in its romantic or affectionate connotations. Heiman (1977) found that erotic and erotic-romantic stories produced higher levels of sexual arousal, measured by genital pulse amplitude and blood volume, than romantic or neutral stories. This was true of both males and females. Osborn and Pollack (1977) asked

females to read hard-core and erotic realism stories. They found that sexual arousal, measured by vaginal pressure pulse as well as subjective ratings, was higher for the hard-core than for the erotic realism material. Again, the more explicit material generated higher levels of sexual arousal. These studies support the effectiveness of erotic stimuli in inducing sexual arousal, and also suggest that response to erotica can be measured through both self-report and physiological measures.

Additional studies provide direct evidence for the validity of vaginal photoplethysmography. An early review of the literature (Zuckerman, 1971) concluded that most physiological measures fail to discriminate adequately between sexual and other forms of arousal, the exception being genital measures. Several more recent studies have provided support for this conclusion. A study by Geer et al. (1974) compared responses to a neutral and an erotic film. Vaginal blood volume and pressure pulse showed statistically significant increases during the erotic film ($p < .001$ for pressure pulse and $p < .005$ for blood volume), while heart rate showed a slight nonsignificant increase. A study by Hoon, Wincze and Hoon (1976) measured vaginal blood volume, heart rate, heart rate variability, skin conductance responses, systolic and diastolic blood pressure and forehead temperature during exposure to a neutral, a dysphoric and an erotic film. Vaginal blood volume was the most sensitive in discriminating between the erotic and the

dysphoric films. These studies indicate that vaginal blood volume increases are reliably produced by psychosexual stimuli, and provide valid indications of increases in sexual arousal.

A potential problem in the area of vaginal photoplethysmography is the absence of a standardized method of data sampling. In a recent review of vaginal photoplethysmography, Hatch (1979) discussed methods of data sampling for vaginal blood volume. These techniques include various time sampling procedures as well as measurement of the point of maximum responsivity. Time sampling procedures provide an advantage in terms of ensuring that all subjects are responding to the same stimulus, while measures of maximum responsivity may reflect responses to different stimuli for different subjects. However, the superiority of any particular data sampling technique has not been empirically demonstrated, and it is possible that different data sampling techniques reflect different dimensions of female sexuality. This creates difficulties in comparing the results of studies employing different data sampling procedures.

Self-report measures of sexual arousal are frequently reported in the literature. Although susceptible to demand characteristics as well as social desirability effects, they play an essential role in assessing the cognitive subjective dimension of sexual arousal. Wincze et al. (1977) argued that, since subjects are generally asked to rate their level

of sexual arousal after exposure to erotica, there may be difficulty in recalling level of sexual arousal or confusion as to whether ratings of maximum or average levels of sexual arousal are expected. The authors developed a continuous measure of sexual arousal, which enabled subjects to indicate moment to moment fluctuations in subjective sexual arousal by means of a lever. Although a significant correlation between vaginal blood volume and the continuous measure of sexual arousal was not obtained for group data, correlations across data points within each subject achieved significance for five out of six subjects. Furthermore, subjects indicated higher levels of sexual arousal during erotic scenes relative to nonerotic scenes.

Wincze et al. (1980) examined the possibility that use of the cognitive lever might either reduce genital responsivity through distraction or exert a facilitative effect. Subjects viewed the same erotic film twice, and used the lever during one of the two presentations of the film. Half of the subjects employed the lever during the first viewing of the film, and half during the second viewing. Although apparently inhibiting physiological sexual arousal in males, use of the lever had no effect on vaginal pulse amplitude in females. However, in contrast to the Wincze et al. (1977) study, significant correlations between subjective and physiological measures of sexual arousal were obtained for only two out of eight female subjects. Sexual arousal as measured by the cognitive lever

does not appear to correlate consistently with genital responses. In spite of this limitation, the cognitive lever appears to provide methodological advantages in assessing momentary fluctuations in subjective sexual arousal without distorting physiological responses in females.

As in most areas of psychology, the generalization of findings regarding sexual behaviour from laboratory experiments to naturalistic situations represents an important issue. Several considerations appear relevant to this issue. It is possible that volunteers for sex research represent a biased sample. A study by Kaats and Davis (1971) investigated this possibility. The authors administered questionnaires to several classes of introductory psychology students. There were no differences between subjects who completed the questionnaires and those who did not. However, females who volunteered to fill in further questionnaires in a laboratory study held more liberal attitudes towards sex and had more noncoital sexual experience than those who failed to volunteer. These results suggest caution in generalizing from participants in sex research to the general population. Further limitations stem from the stimulus differences between psychosexual stimuli presented during a laboratory experiment and sexual activity in an interpersonal context involving tactile stimuli.

Several studies have examined the relationship between response to erotica and various sexual attitudes and

behaviours. Kinsey et al. (1953) hypothesized that frequency of masturbation would provide a valid indicator of sexual interest in females while frequency of heterosexual activity would not. Females would be expected to initiate heterosexual activity rarely. This suggests that response to erotica might be more closely related to frequency of masturbation than to frequency of heterosexual activity in females. However, Griffitt (1975) found that females with more heterosexual and masturbatory experience rated erotic slides as more arousing than did females with lower levels of sexual experience. These results contradict Kinsey et al.'s (1953) hypothesis and suggest that both heterosexual and masturbatory experience may be valid indicators of sexual interest in females. Similar results were obtained in a study by Mosher and Abramson (1977), which measured subjective ratings of sexual arousal and self-report of physiological sexual sensations in response to films depicting masturbation. Again, females with greater heterosexual and masturbatory experience reported higher levels of sexual arousal and physiological sensations. However, males with less heterosexual experience reported higher levels of sexual arousal and physiological sensations than did more experienced males. The authors speculated that low levels of sexual experience in males were equivalent to high levels in females, and suggested a curvilinear relationship between heterosexual experience and response to erotica. Individuals with moderate levels of

sexual experience may show the greatest response to erotica. This hypothesis is consistent with the results of a study by Heiman and Morokoff, (1977, cited in Morokoff and Heiman, 1980). Married women exhibited lower levels of physiological responsivity to an erotic videotape than did unmarried women, presumably as a result of their greater sexual experience.

The Mosher and Abramsop (1977) study also reported a relationship between sex guilt measured by the Mosher Forced Choice Guilt Inventory and response to erotica. Subjects with lower levels of sex guilt reported stronger genital sensations than did subjects with high levels of sex guilt. Griffitt and Kaiser (1978) found that subjects with high levels of sex guilt reported less positive affective reactions to erotic slides and made fewer correct choices in a discrimination task in which correct responses were followed by exposure to erotica.

Sexual orientation may also be related to response to erotica. Storms (1980) examined the relationship between sex role orientation and scores on the Erotic Responses and Orientation Scale, a measure of erotic fantasies towards males and females. The results suggested that homosexuals tend to fantasize about members of the same sex while heterosexuals tend to fantasize about members of the opposite sex. Bisexuals tend to fantasize about members of the same sex to the same degree as homosexuals, and also fantasize about members of the opposite sex to the same

extent as do heterosexuals. This finding suggests that erotica depicting heterosexual activities might induce equally high levels of sexual arousal in heterosexuals and bisexuals, while generating a lesser response in homosexuals.

Several attitudes and behaviours appear to be related to vaginal vasocongestion in response to erotica. In a combined sample of six women reporting satisfactory sexual functioning and six women with orgasmic dysfunction, Wincze et al. (1976) found high positive correlations between vaginal blood volume and scores on the Sexual Arousability Inventory, ratings of awareness of physiological changes during sexual activity, day in menstrual cycle and frequency of intercourse. Abramson et al. (1976) examined the relationship between phase of menstrual cycle and self-report measures of response to erotica. A relationship between phase of menstrual cycle and response to erotica was obtained, with subjects in the premenstrual phase reporting the lowest levels of sexual arousal and subjects in the menstrual phase reporting the highest levels. However, this finding was true only for women employing contraceptive pills. These studies suggest that subjective and physiological responses to erotica are related to various sexual attitudes and behaviours, as well as possibly phase of menstrual cycle.

Exposure to erotica has been employed in order to examine the effects of cognitive processes and prior

emotional or mood states on sexual arousal. Cognitive processes, such as fantasy, attention and expectancy play an important role in the development of sexual arousal. Heiman (1977) found that sexual fantasies produced changes in physiological measures of sexual arousal. Geer and Fuhr (1976) found that performing a distracting task while listening to an erotic story inhibited penile tumescence. This suggests that attention and concentration play some part in the process of sexual arousal. Expectancy also appears to affect sexual arousal. Heiman (1977) reported that some subjects showed anticipatory increases in genital measures of sexual arousal prior to presentation of erotic material.

Expectancy effects on sexual arousal have also been examined in the context of alcohol research, since many subjects believe that alcohol enhances sexual arousal. Wilson and Lawson (1976a) found that males who had been informed that they had consumed alcohol showed higher levels of penile tumescence in response to an erotic film than those who believed they had consumed a nonalcoholic beverage. These results suggest that alcohol-related expectancies exert a facilitative effect on sexual arousal. However, a similar study (Wilson and Lawson, 1976b) suggested that expectancy of increased sexual arousal may decrease sexual arousal under some circumstances. One group of female subjects was informed that their scores on a personality questionnaire indicated that alcohol would

increase their sexual arousal, while another group was told to expect a decrease. Subjects expecting an increase in sexual arousal displayed less vaginal vasocongestion than subjects expecting a decrease. The authors suggested that the demand characteristics of the experiment had induced performance anxiety in subjects expecting an increase in sexual arousal. This may have inhibited their response to the erotic stimuli. These results illustrate the complexity of expectancy effects on sexual arousal.

Emotional context appears to exert an important influence on sexual arousal. Several studies have examined the effects of emotional and arousal states such as nonspecific physiological arousal, aggression, anxiety and depression on response to erotica. Predictions regarding such effects have been developed from both cognitive and physiological theoretical formulations.

The effects of prior excitation on sexual arousal have been investigated for their effects on cognitive labeling. This concept stemmed from Schacter's (1962) study, in which subjects injected with epinephrine who lacked an explanation for their state of arousal tended to label their arousal in a manner compatible with environmental cues. The same kind of arousal was experienced as euphoria or anger, depending on the social context. Although recent replications (Maslach, 1979; Marshall and Zimbardo, 1979) suggest that high levels of arousal are inherently aversive, rather than neutral, this does not necessarily invalidate the concept of

cognitive labeling. Cantor et al. (1975) demonstrated that, under certain circumstances, physiological arousal produced by exercise would be relabeled as sexual arousal. One group of males viewed an erotic film immediately after exercising. A second group viewed the film at a point when they believed they had recovered from exercising, although in fact they were still physiologically aroused. A third group saw the film, correctly believing that they had recovered. The second group produced the highest ratings of sexual arousal. Lacking an explanation for their physiological arousal, they attributed it to the effects of viewing the film. This study illustrates the enhancement of sexual arousal through cognitive labeling of physiological excitation, and raises the possibility that sexual arousal might also be facilitated through relabeling of other kinds of emotional arousal.

Several studies have investigated mutual/facilitative and inhibitory effects of sexual arousal and aggression. Malamuth et al. (1977) have hypothesized that, since sexual arousal and aggression are both emotions subject to some degree of cultural disapproval, discriminative cues regarding the acceptability of one would be expected to generalize to the other. Cues which inhibit (or disinhibit) the expression of aggression might also inhibit (or disinhibit) the development and expression of sexual arousal. Malamuth et al. (1977) discussed several studies which found that inclusion of aggressive elements in erotic

stories resulted in higher ratings of sexual arousal. The authors interpreted these results as supporting the hypothesis regarding generalization of discriminative cues. Alternatively, it is possible that the aggressive aspects of the stimuli generated additional arousal which was labeled and experienced as sexual arousal.

Studies investigating the effects of sexual arousal on subsequent aggression have employed the concept of labeling, as well as other cognitive mechanisms. Some of these cognitive mechanisms may also have relevance for the effects of various emotional states on subsequent sexual arousal. In a typical experiment, subjects are provoked in some fashion either before or after exposure to erotic material and then provided with an opportunity to display aggression. Some studies find that exposure to erotica following provocation facilitates aggression (eg. Zillman, 1971), while others report inhibitory effects (eg. Baron, 1974). Donnerstein et al. (1975) attempted to explain these contradictory results by manipulating the intensity of the erotic stimuli as well as the temporal sequence of the provocation and exposure to erotica. The results suggested that, among subjects who were first provoked and then viewed erotica, mild erotica inhibited subsequent aggression while strong erotica had little effect. However, a facilitative effect was found when subjects viewed erotica prior to being provoked. The authors suggested that exposure to erotica produces two kinds of effects. It facilitates aggression by

increasing arousal, which is then labeled as aggression. It also inhibits aggression by promoting attentional shifts. The subject continues to think about the erotic material rather than attending to the provocation and behaves less aggressively as a result. The relative strength of the inhibitory and facilitative effects depends upon the nature and temporal placement of the erotic stimuli.

The inhibitory effects of mild erotica on subsequent aggression have also been explained in terms of hedonic incompatibility (White, 1979). Erotic stimuli vary in the qualitative form of arousal they elicit, some producing pleasurable affect and others being offensive. It is possible that mild erotica produces primarily positive affect, while stronger, potentially offensive forms of erotica generate negative affect. White (1979) tested the hypothesis that arousal produced by unpleasant erotic material is conducive to a cognitive relabeling process which facilitates subsequent aggression, while pleasurable sexual arousal is labeled in more positive terms, resulting in an inhibitory effect on subsequent aggression. Male subjects viewed four sets of erotic stimuli which varied according to positive sexual arousal (high or low) and negative affect (high or low). Subjects exposed to the material producing high sexual arousal and low negative affect displayed less aggression than subjects in the other three groups, indicating that the positive sexual material inhibited subsequent aggression. Subjects exposed to erotic

material generating high levels of both sexual arousal and negative affect showed a tendency towards enhanced aggression. The author explained the results in terms of hedonic incompatibility and cognitive labeling. These studies raise the question of whether factors such as distraction, hedonic incompatibility and cognitive labeling processes might mediate the effects of prior emotional states on sexual arousal.

The effects of dysphoric mood states, such as anxiety and depression on sexual arousal are of particular interest from a clinical perspective. Clinical anecdotal evidence suggests that depression and anxiety inhibit sexual functioning (Kaplan, 1974). Reduced sexual interest is frequently included as a diagnostic indicator of depression (Beck et al., 1979). Laboratory studies provide a precise means of investigating the effects of dysphoric mood states on sexual arousal and exploring the mechanism through which these effects occur.

While clinical evidence suggests that anxiety inhibits sexual arousal, the concept of cognitive labeling predicts a facilitative effect under certain circumstances. Physiological arousal generated by anxiety-arousing stimuli may under certain conditions be relabeled as sexual arousal. Results of a study by Dutton and Aron (1974) suggested that anxiety may heighten sexual arousal. Males walking on either a narrow, wobbly suspension bridge with a long drop to rocks below or a more solid bridge were asked to respond

to a Thematic Apperception Test (TAT) card. It was assumed that the suspension bridge was anxiety-inducing. When the experimenter was female, subjects on the suspension bridge showed higher levels of sexual imagery in their TAT responses than those on a solid bridge. In another experiment, males who anticipated a strong electric shock rated a female confederate as more attractive than those who anticipated a mild shock. Dutton and Aron (1974) suggest that sexual labels may be applied to the physiological correlates of anxiety, resulting in enhancement of sexual arousal. The authors also speculated that some emotional states may disinhibit the expression of pre-existing sexual feelings, as well as directly increasing sexual arousal. However, it is not clear whether the dependent measure of sexual imagery and ratings of sexual attractiveness actually reflect sexual arousal. Furthermore, a recent attempt by Roviato and Holmes (1980) to replicate the results of the laboratory experiment was unsuccessful. In this study, one group of male subjects was told that they would receive strong electric shock at the end of the experiment, while another group was not given these instructions. Half of the subjects subsequently viewed an erotic film, while the other half viewed a neutral film. It was hypothesized that if transfer of anxiety occurred, and if it was specific to sexual arousal, the threat of shock would increase ratings of sexual arousal in the group viewing erotica, while exerting little or no effect on response to the neutral

film. The results did not support the hypothesis. Data on pulse rate and electrodermal activity suggested that the shock threat and the erotic film had both been effective in increasing arousal. However, the absence of an interaction between the two conditions suggested that a specific transfer of arousal had failed to occur. In fact, subjects exposed to threat rated the erotic film as less sexually arousing, as well as less attractive, and the neutral film as less exciting and attractive than subjects who had not been exposed to threat. The authors suggested that facilitation of sexual arousal through cognitive labeling processes had failed to occur because subjects were able to correctly identify the source of their anxiety arousal. Threat of shock might have inhibited sexual arousal through the process of distraction. The discrepancy between the results of Dutton and Aron (1974) and Roviario and Holmes (1980) may have been due to the differences in measures of sexual arousal. The clinical hypothesis that anxiety states inhibit sexual arousal is contradicted by the Dutton and Aron (1974) study and supported by the Roviario and Holmes (1980) study. (

Physiological formulations have also been employed to provide hypotheses regarding the effects of prior mood states on subsequent response to erotica. Wolpe (cited in Hoon et al., 1977) has argued that some emotional states, such as anxiety, are characterized primarily by activation of the sympathetic nervous system, while others, such as

sexual arousal, involve primarily parasympathetic activity. These two kinds of emotional states are believed to be mutually inhibitory. In fact, psychophysiological measures indicate the presence of a sympathetic component of sexual arousal (Wenger et al., 1968). A study by Hoon et al. (1977) examined the effects of viewing an anxiety-arousing film, which depicted car accidents, presented before and after exposure to erotic material. Only female subjects were included, and sexual arousal was measured by changes in vaginal blood volume. Subjective responses were not measured. As predicted, sexual arousal showed a greater and more rapid decrease when an erotic film was followed by the anxiety-arousing film rather than a neutral film. However, sexual arousal showed a greater and more rapid increase when the erotic film followed the anxiety-arousing film rather than the neutral film. This finding is inconsistent with the thesis of an incompatibility between sexual arousal and anxiety. Hoon et al. (1977) suggested that the relationship between sexual arousal and anxiety depends on context. Wolpe (1978) argued that the data did not disconfirm an incompatibility between sexual arousal and anxiety, since the two kinds of stimuli were not presented simultaneously. Wolpe (1978) suggested that the increase in sexual arousal following anxiety pre-exposure may have been due to a relief state.

Wolchik et al. (1980) reported a similar study. Male subjects were exposed to either a travelogue, a film

producing depression and anger, or a film producing anxiety and anger prior to viewing erotica. The results suggested that sexual arousal, as measured by penile tumescence, was enhanced by prior exposure to the anxiety-arousing film but inhibited by the film producing depression and anger. The depression and anger inducing film, which showed scenes of car accidents, was identical to the film employed in the Hoon et al. (1977) study with females. This same film increased subsequent sexual arousal in females (Hoon et al., 1977), while producing a decrease in males (Wolchik et al., 1980). The latter authors argued that, according to results from pilot research, females reacted to this film with anxiety and depression, while males reacted with depression and anger. Sex differences in response to the erotic film may have stemmed from sex differences in the emotional response to the previous film. However, the existence of this sex difference raises the possibility that the effects of the film depicting car accidents were not clearly interpreted. Wolchik et al. (1980) concluded that depression inhibits sexual arousal while mild anxiety produced by laboratory stimuli facilitates sexual arousal. The authors suggested that, consistent with clinical evidence, sexual arousal might be inhibited by anxiety which is either more intense or related to sexuality.

The literature contains a number of contradictory hypotheses and empirical results regarding the effects of dysphoric mood states on sexual arousal. Anecdotal evidence

and hypotheses involving reciprocal inhibition, hedonic incompatibility and distraction suggest that dysphoric mood states would inhibit sexual arousal. This prediction is supported by several studies examining the effects of stimuli designed to create anxiety or depression on response to erotica in various contexts. Wolchik et al. (1980) found that prior depressed mood inhibited subsequent response to erotica. Royiario and Holmes (1980) found that anxiety due to anticipation of electric shock while viewing erotica inhibited sexual arousal. Hoon et al. (1977) found that an anxiety-arousing film sped up the return of vaginal blood volume towards baseline when it followed the erotic film. These studies suggest that mood states such as anxiety and depression may inhibit sexual arousal if a dysphoric mood state is created before, during or after an erotic stimulus. However, they do not indicate which mechanisms are responsible for these inhibitory effects.

Alternative hypotheses suggest that moods of anxiety induced prior to or during exposure to erotica may exert a facilitative effect on sexual arousal. The possibility of developing a state from which sexual feelings would be a relief is consistent with a facilitative effect. Hypotheses regarding cognitive labeling processes would lead to the same prediction, providing the dysphoric mood state generated arousal. Prior exposure to anxiety-arousing stimuli has been found to facilitate sexual arousal on subjective measures (Dutton and Aron, 1974) and

physiological measures (Hoon et al., 1977; Wolchik et al., 1980).

Further research appears necessary in order to clarify the circumstances under which various facilitative and inhibitory processes occur. One issue involves the relationship between physiological and subjective measures of sexual arousal. Most studies in this area have assessed the effects of prior experimental manipulations on either physiological sexual arousal (eg. Hoon et al., 1977) or subjective sexual arousal (eg. Roviario and Holmes, 1980). However, no study has apparently examined both dimensions of sexual arousal simultaneously. It seems possible that prior mood manipulations might exert different effects on subjective and physiological aspects of sexual arousal. A second factor which may contribute to discrepancies between studies involves the nature of the dysphoric stimulus and the resulting mood. A wide variety of experimental mood induction procedures have been employed, ranging from a suspension bridge to threatening subjects with electric shock and exposing them to dysphoric films. These different techniques may result in the induction of a variety of emotional states, which have not been clearly assessed. The importance of specifying the effects of an experimental mood manipulation is illustrated by the film depicting car accidents employed by Hoon et al. (1977) and Wolchik et al. (1980). This film produced different emotions in the two sexes and altered their subsequent response to erotica

differentially. This discrepancy points to a need to employ standardized dysphoric stimuli and to specify their effects. A third point requiring clarification involves the level of arousal produced during the dysphoric mood state. It would appear useful to measure the effects of a dysphoric stimulus on arousal, since different levels of arousal might imply different processes. For example, a dysphoric stimulus generating low levels of arousal might be hedonically incompatible with erotica and result in inhibitory effects. However, a dysphoric stimulus generating high levels of arousal might enhance subsequent response to erotica through cognitive labeling processes. A fourth question, which has received little attention in the literature, involves the effects of euphoric mood states. In order to further clarify the effects of dysphoric stimuli on sexual arousal, it might be useful to compare dysphoric with euphoric stimuli. The possibility of cognitive labeling processes enhancing sexual arousal would suggest that both dysphoric and euphoric states of arousal might have similar facilitative effects. However, hypotheses referring to hedonic incompatibility and the development of a state of relief would imply that dysphoric mood states would have different effects on response to erotica than euphoric mood states.

A standardized means of inducing mood states developed by Velten (1967) appears to provide a number of advantages in studying the effects of euphoric and dysphoric stimuli on

response to erotica. This procedure involves exposure to sets of statements with either elated, depressed or neutral contents. This mood induction technique has been examined in a number of studies. Velten (1968) exposed five groups of subjects to either depressed, elated or neutral mood induction statements, or instructions to role-play either elated or depressed mood. Role-playing was employed as a control for experiment demand characteristics. Mood was assessed through ratings of depression measured by the Multiple Affect Adjective Check List, writing speed, distance estimation, perceptual ambiguity, word associations, decision time and spontaneous verbalizations. The elated and depressed mood groups differed significantly from each other on four of the seven measures, the elated mood and elated role-playing groups on two, and the depressed mood and depressed mood role-playing groups on three. On ratings of depression, the depressed mood group was significantly different from the other four groups, while the elated mood group was significantly different from the depressed mood role-playing group. Strickland et al. (1975) found that the elated, depressed and neutral mood groups differed from each other on the Multiple Affect Adjective Check List measures of depression and anxiety in the predicted direction. The elated mood group was significantly more expansive on a test of graphic constriction-expansion than the depressed mood group, and reported a greater preference for social as opposed to

solitary activity. No differences were obtained on a time estimation task. Hale and Strickland (1976) found that the elated and depressed mood groups differed with respect to scores on the Depression Adjective Check List, performance on the Digit Symbol Substitution Task, writing speed, and graphic expansion, but not on the Stroop Colour Word Test, estimate of time spent reading, interpersonal distancing or helpfulness. These studies suggest that the Velten (1968) procedure produces consistent differences in mood ratings, although less consistent differences on various behavioural measures.

Frost et al. (1979) compared the effectiveness of self-devaluative statements and statements suggesting depressive somatic states in inducing depressed mood. The results suggested that the effectiveness of the Velten (1968) procedure in creating depressed moods lies in the statements suggesting depressive somatic states. Polivy and Doyle (1980) assessed the role played by demand characteristics in the mood induction procedure. This study included the five groups employed by Velten (1968), and added elated and depressed counter-demand characteristics groups. The counter-demand characteristics groups were told that subjects generally experienced the mood opposite to that described in the statements as a result of social comparison processes. If demand characteristics were operating, subjects asked to role-play depressed and elated moods without viewing the mood statements would be expected

to behave similarly to subjects who viewed the statements, while subjects in the counter-demand group would be expected to behave as if they were experiencing the mood opposite to that described by the statements. On the depressed mood scale of the Multiple Affect Adjective Check List, each of the seven groups was significantly different from each of the others, with only one exception. The neutral mood and elation counter-demand characteristics groups did not differ significantly from each other on this measure. The depression demand characteristics group reported the highest level of depressed mood, followed by the depressed mood group, the depression counter-demand characteristics group, the neutral mood group, the elation counter-demand characteristics group, the elated mood group, and the elation demand characteristics group in that order. A similar pattern of results was obtained on the anxiety and hostility scales of the Multiple Affect Adjective Check List, although fewer paired comparisons achieved significance on these two measures. These results indicate that demand characteristics exert significant effects. The counter-demand characteristics groups most closely resembled the group viewing neutral statements, suggesting that the counter-demand characteristics counteracted the effects of the mood statements. However, during debriefing, approximately half of the subjects in the mood induction and demand characteristics groups, as well as about one third of the subjects in the counter-demand condition, reported

experiencing the mood described by the statements. The authors concluded that although demand characteristics are influential, the Velten (1968) procedure results in genuine temporary changes of mood. It is possible that instructions to experience the mood are essential in producing this effect. Although support for the effectiveness of this procedure has not been unequivocal, its effects on a variety of measures provide evidence of a certain degree of validity.

The effects of the Velten (1968) mood induction procedure on arousal have not been clarified. Although Matheny and Blue (1977) found that this technique had no effect on heart rate and galvanic skin response, the following considerations suggest that it may exert some effects upon arousal. The Matheny and Blue (1977) study found that the mood induction procedure affected reaction time, but failed to replicate the effects of Velten (1968) with regard to writing speed and decision time. The authors' finding that the mood induction technique did not affect physiological arousal would have carried more weight had they been able to demonstrate significant effects for the behavioural measures. Since some of the mood statements involve somatic suggestions, it would seem possible that this technique might produce changes in somatic dimensions such as arousal. Furthermore, a model of arousal developed by Thayer (1978a) suggests that mood changes may be correlated with changes in arousal. This model, developed

from factor analytic studies of adjective ratings, suggests that arousal may be conceptualized as involving two dimensions. One dimension involves a continuum ranging from energy to sleep, and the other, a continuum ranging from tension to placidity. Thayer (1978a) reports a study in which eight females completed self-report measures of arousal on days when they were and were not depressed. Reports of depression were associated with reports of tension and tiredness, suggesting that these two dimensions of arousal are related to mood. Thayer's (1978a) model of arousal suggests that the Velten (1968) depressed mood statements may result in tension and tiredness, the elated mood statements in feelings of energy and placidity, and the neutral mood statements in no change in arousal.

The present study attempted to examine the effects of three experimental mood induction procedures intended to create elated, depressed and neutral states respectively on response to erotica in females. The procedure developed by Velten (1967) was employed, and its effects were assessed through self-report measures of depression and arousal as well as a task involving writing. Subjective measures of sexual arousal, as well as vaginal blood volume were employed in order to determine whether the prior mood-states affected subsequent response to erotica. It was expected that subjects exposed to the depressed mood treatment would show the lowest levels of sexual arousal and subjects in the elated mood the highest, with the neutral mood group showing

intermediate levels of sexual arousal. The hypothesis that the depressed mood statements would decrease sexual arousal is consistent with clinical evidence regarding inhibitory effects of dysphoric mood states on sexual arousal, the concept of hedonic incompatibility, and Wolchik et al.'s (1980) finding that a film producing depression and anger in males decreased subsequent sexual arousal. The effects of elated mood states have received little attention in the literature. However, if the elated mood treatment increased feelings of energy, this would suggest that cognitive labeling processes may result in an enhancement of sexual arousal. The neutral mood statements would not be expected to affect either mood or subsequent response to erotica.

A second purpose of the present study involved examining the relationship between response to erotica and several measures of subjects' sexual behaviour, sexual attitudes and demographic variables. As discussed earlier, response to erotica has been found to correlate with a number of such variables. However, the best predictors of response to erotica have not been identified. The present study attempted to assess the predictive power of age, phase of menstrual cycle, sexual arousability, sexual experience, sex guilt, sexual orientation, frequency of masturbation and frequency of heterosexual activity on response to erotica.

Method

Subjects

Subjects were obtained from undergraduate classes through announcements and advertisements on campus. These advertisements provided a general description of the experiment with regard to the film, questionnaires, physiological measures, and \$10 payment. Each subject was contacted by telephone prior to participating in the experiment. At this point, the procedure was described in detail (refer to Appendix A). Before being given an appointment, subjects were asked whether they had any vaginal infection in order to exclude them from the experiment as a health precaution. No subjects were in fact eliminated on this basis. Subjects were also encouraged to ask questions about the procedure. If necessary, reassurance was given regarding concerns such as confidentiality and pain, but no attempt was made to persuade reluctant subjects to participate. About 25% of potential subjects refused to participate after hearing a description of the experiment.

The subjects were thirty-six women between the ages of 19 and 45, $\bar{X}=26.2$, $sd=6.0$, Twenty-five were students at the undergraduate level and nine at the graduate level. Of the two nonstudents, one was employed and one unemployed. Nine were married, twenty-three single, and four separated or divorced. Two subjects were homosexual. Their data were excluded from the analyses, and two subjects were tested as

replacements. The mean score of the subject sample on the Sexual Arousability Inventory was $\bar{x}=85.6$, $sd=23.1$. These scores did not differ appreciably from scores reported by Hoon, Hoon and Wincze (1976), $\bar{x}=80.9$, $sd=22.7$, based on two samples, each including approximately 140 females obtained from graduate and undergraduate classes and women's centers.

The subjects were divided into three groups, receiving experimental manipulations designed to produce depressed, elated and emotionally neutral mood states respectively. Twelve subjects were assigned to each group.

Apparatus

Stimulus Materials. The stimulus materials were recorded on three 60-minute videocassettes, and were displayed on a Sony 18-inch colour monitor by means of a tape deck. Each videocassette consisted of a travelogue, auditorily presented instructions for the mood induction procedure followed by a series of printed mood statements, and ended with the erotic film. The same travelogue and erotic film appeared on each videocassette, but the mood statements varied according to whether the content was neutral, elated or depressed.

The travelogue lasted 5 minutes and depicted nature scenes, such as horses grazing in fields, birds and flowers. The instructions for the mood induction procedure were adapted from Velten (1967). Instructions presented prior to the neutral statements informed subjects that they would be shown a series of statements, and asked them to concentrate

on each statement. Instructions prior to the elating and depressing statements informed subjects that they would be shown a series of statements representing a certain mood and emphasized the importance of attempting to experience the mood (refer to Appendix B). These instructions lasted 3 minutes and 40 seconds. Each series of mood statements consisted of 50 items. The neutral statements are presented in Appendix C, the depressed statements in Appendix D, and the elated statements in Appendix E. Each statement appeared for 18 seconds and was followed by a two-second pause. The first forty statements were separated from the last ten by a 30-second pause in order to permit paper and pencil measures of mood to be administered. The erotic film began almost immediately after the final mood statement, and lasted 4 minutes and 30 seconds. It depicted a couple walking through a forest disrobing and engaging in foreplay and simulated male superior intercourse.

Vaginal Blood Volume. Vaginal blood volume was measured using a photoplethysmograph developed by Sintchak and Geer (1975) which is manufactured by Farrell Instruments. The photoplethysmograph is a plexiglass cylinder 4.45 centimeters long with a diameter of 1.27 centimeters, containing a light source, a photoresistive cell and connecting wires. It measures reflected infrared light up to approximately 7000 angstroms, and is attached to a cable covered with soft vinyl tubing. The probe resembles a tampon in size and weight, and can be inserted into the

vagina with comfort and ease. The probe was sterilized in a solution of Cidex-7 (activated gluteraldehyde, manufactured by Arbrook Ltd. as Aqueous Cidex, Product CX-250) prior to use. Changes in vaginal blood volume were recorded on a four-channel Physiograph (E and M Company, Type PMP-4A).

The Continuous Measure of Subjective Sexual Arousal.

Subjects indicated moment to moment changes in sexual arousal while viewing a travelogue and an erotic film by moving a lever device. This device was mounted on the right armrest of the reclining chair in which they were seated, and moved through an arc of approximately 90°. The position of the lever was recorded continuously on the physiograph.

Paper and Pencil Measures of Subject Characteristics

Depression. The Beck Depression Inventory (Beck et al., 1979) was employed as a measure of feelings of depression during the week prior to testing. This questionnaire consists of 21 multiple choice items derived from clinical conceptions of depression. The items refer to feelings such as sadness, guilt and disappointment in oneself, as well as somatic aspects of depression such as loss of energy and weight. Subjects were asked to respond to each item using the previous week as their reference. Beck et al. (1961) administered the inventory to a sample of psychiatric patients in order to assess reliability and validity. The relationship between individual items and the total score was examined. For each of the 21 items,

subjects were grouped according to which of the four responses they had endorsed. The Kruskal-Wallis Non-Parametric Analysis of Variance was employed to determine whether subjects selecting different responses to a particular item differed in their total score on the inventory. With the exception of weight loss, all items showed a significant relationship with the total score, $p < .001$. The item referring to weight loss was significant at the .01 level. A correlation of .86 between odd and even items was obtained. These data provide support for the internal consistency of this measure. In order to assess validity, ratings of severity of depression (none, mild, moderate or severe) were obtained through clinical interviews. Scores on the Beck Depression Inventory showed significant differences, $p < .0004$, between adjacent categories of clinical ratings of depression. These data provide support for the criterion validity of this measure.

Sexual Experience and Responsiveness. Sexual experience and responsiveness were assessed using the Sexual Arousability Inventory, the Sex Guilt subscale of the Mosher Forced Choice Guilt Inventory, and the Bentler Heterosexual Experience Scale. The Sexual Arousability Inventory (Hoon, Hoon and Wincze, 1976) consists of 28 items describing various sexual activities. Each item is rated on a seven-point scale ranging from adversely affecting sexual arousal to extremely arousing. The inventory has demonstrated high internal consistency, with an alpha

coefficient of .91 and a Spearman-Brown split-half coefficient of .92. Test-retest reliability on a sample of 48 women, with testing periods separated by eight weeks, achieved a value of .69. Correlations between scores on this inventory and eight self-report measures of sexual activity, such as frequency of intercourse and orgasm, number of sexual partners and awareness of physiological changes during sexual arousal ranged from .24 to .57, $p < .01$. A significant difference in the predicted direction, $p < .001$, was obtained between test scores of a sample of women seeking sex therapy and a cross-validation sample.

The Bentler (1968) Heterosexual Experience Scale was employed in order to assess the range of sexual acts which subjects had experienced. This scale consists of 21 items describing a hierarchy of sexual activities ranging from one minute continuous lip kissing to mutual oral manipulations of genitals to mutual orgasm. Bentler (1968) reported that this scale displays a high degree of internal consistency, with a Kuder-Richardson coefficient exceeding .95. This scale is generally administered by asking subjects to indicate only the item highest on the hierarchy which they have experienced. This method assumes that subjects endorsing a particular item have experienced all previous items, an assumption which would lead to confusion if untrue for a particular subject. Subjects were therefore asked to indicate each of the activities they had engaged in, with the score for each subject reflecting the total number of

items endorsed.

The Sex Guilt subscale of the Mosher Forced Choice Guilt Inventory was also administered. This subscale consists of 39 items, each including a sentence stem and a choice between a guilty and a nonguilty completion. Examples of items include the following: If in the future I committed adultery ... A. I hope I would be punished very deeply. B. I hope I enjoy it; "Dirty" jokes in mixed company ... A. do not bother me. B. are something that makes me very uncomfortable. Mosher (1968) administered several measures of guilt and social desirability to a sample of 62 female students and obtained a multitrait-multimethod matrix. The forced choice measure of sex guilt displayed a high reliability of .95. This measure showed high correlations with sex guilt scores measured by an incomplete sentences test, $r = .64$, and a true-false questionnaire, $r = .86$, providing evidence of convergent validity. The sex guilt subscale showed lower correlations with two other forced choice guilt subscales (hostility-guilt, $r = .39$, and morality-conscience, $r = .55$), as well as the Marlowe-Crowne Social Desirability Scale, $r = -.07$, and the Edwards Social Desirability Scale, $r = .12$. These correlations support the discriminant validity of this subscale.

As was discussed in a previous section, the above measures of sexual arousability, sexual experience and sex guilt appear to be related to response to erotica. They

also appear to be correlated with each other. Langston (1975) found a correlation of $-.56$ between scores on sex guilt and the Bentler Heterosexual Experience Scale in a sample of 166 female undergraduate students. Hoon, Hoon and Wincze (1976) reported a correlation of $.42$ between scores on the Sexual Arousability Inventory and the Bentler Heterosexual Experience Scale in a sample of 134 females. These data provide support for the construct validity of sexual arousability and sexual experience.

Demographic Variables. Subjects filled in a questionnaire related to the following demographic variables: age, marital status, whether or not the subject had children, education, employment, phase of menstrual cycle, contraceptive use, sexual orientation, frequency of sexual activity, and frequency of masturbation. This questionnaire is displayed in Appendix F.

Paper and Pencil Measures of Response to Experimental Stimuli

Measures of Response to Mood Induction Procedure. Mood was measured by the Depression Adjective Check Lists, the Activation-Deactivation Adjective Check List, the Digit Symbol Substitution Test, and the Feelings Scale. Forms A and C of the Depression Adjective Check Lists (Lubin, 1967) were employed as measures of transient depressed mood. Each list consists of 32 mood adjectives, referring to both negative mood states, such as cheerless and blue, as well as positive mood states, such as free and peaceful. Subjects

are instructed to check off items which describe their present feelings. Scores are obtained by adding the number of negative adjectives and subtracting the number of positive adjectives endorsed. Coefficients of internal consistency employing a sample of 156 females achieved values of .86 and .88 for forms A and C respectively. Coefficients of split-half reliability on a sample of 469 females were equal to .92 for both forms. The two forms showed a correlation of .86 with each other when administered to a sample of 35 females. Both forms discriminated between samples of normals, nondepressed patients and depressed patients (Lubin, 1967). Hale and Strickland (1976), found that subjects exposed to the Velten (1968) depression condition scored higher on the Depression Adjective Check List than subjects receiving either the neutral or elation condition.

The short form of the Activation-Deactivation Adjective Check List (Thayer, 1978b) was employed in order to assess arousal. This scale consists of 20 adjectives rated on a four-point scale, with the points defined as definitely feel, cannot decide, feel slightly and definitely do not feel. This scale results in scores for four measures of arousal: General Activation, which consists of the adjectives full of pep, active, vigorous, energetic and lively; Deactivation-Sleep, which consists of the items drowsy, sleepy, tired, wide-awake and wakeful; High Activation, which consists of the items tense, jittery,

clutched-up, intense and fearful; and General Deactivation, which consists of the items placid, at-rest, calm, still and quiet. Two composite scores were obtained, one combining scores on General Activation and Deactivation-Sleep to reflect a continuum ranging from feelings of energy to feelings of tiredness, and the other combining scores on High Activation and General Deactivation to represent a continuum ranging from feelings of tension to feelings of calmness.

Thayer (1967) developed the Activation-Deactivation Adjective Check List by asking 211 students to complete a check list consisting of 28 adjectives referring to activation and 21 adjectives referring to mood. The results of a factor analysis employing an orthogonal rotation suggested that the activation adjectives loaded on the four factors as described above. Thayer (1978b) administered adjective check lists to a sample of 515 students and performed a factor analysis employing an oblique rotation, which permits the emergence of correlated factors. The factor structure was similar to that reported by Thayer (1967). A correlation of $-.58$ was obtained between General Activation and Deactivation-Sleep, and a correlation of $-.50$ between High Activation and General Deactivation. These correlations, as well as the results of a second-order factor analysis, suggest that the four factors can be interpreted as two dimensions of arousal.

Thayer (1970) examined the correlations between the

four activation factors and measures of skin conductance, heart rate, finger blood volume and muscle action potential in a sample of 38 subjects. The procedure involved asking subjects to rest and then to perform a mental task. Change scores for physiological and self-report measures of arousal were obtained. Correlations between the self-report and physiological measures were higher than the intercorrelations among the physiological measures. A physiological index obtained by adding the four physiological measures showed significant correlations ($p < .05$) with each of the four self-report factors. This study supports the criterion validity of the Activation-Deactivation Adjective Check List.

The Digit Symbol Substitution Test, a subtest of the Wechsler (1955) Adult Intelligence Scale, was employed as a performance measure of mood. Subjects are shown a key which displays a series of symbols corresponding to the digits 1 to 9. Underneath the key appear lines of numbers with empty boxes appearing below each number. Subjects are given 90 seconds in which to write the corresponding symbol below each number, working from left to right. Clinical evidence suggests that performance on this test may be impaired by psychomotor retardation resulting from depression (Rapaport et al., 1968). Hale and Strickland (1976) found that subjects exposed to the Veltan (1968) elation condition showed significantly superior performance on this test than subjects exposed to the depression condition, suggesting

that this test is sensitive to experimental manipulations of mood.

Measures of Response to Travelogue and Erotic Film.

The Feelings Scale (Byrne et al., 1974) was employed in order to assess affective responses to the travelogue and to the erotic film. This scale consists of 10 adjectives rated on a seven-point scale, which are summed in order to obtain scores for positive and negative affect. The measure of positive affect consists of the following items: excited, entertained, sexually aroused, anxious, curious and bored. The measure of negative affect consists of the items disgusted, nauseated, angry and depressed. Byrne et al. (1974) displayed stimuli involving heterosexual, homosexual and autosexual activities to thirty-two married couples. The results of a factor analysis suggested that two independent factors, Positive Affect and Negative Affect, explained 90% of the variance in the Feelings Scale. This factor structure was replicated by White (1979), suggesting that the Feelings Scale provides measures of positive and negative affect, with these two dimensions being independent of each other. Byrne et al. (1974) found a relationship between scores on the Feelings Scale and ratings of pornography, providing some evidence of the construct validity of this measure.

Procedure

Each subject was tested during one session.. All subjects viewed videotapes displaying a travelogue, a series

of statements designed to create a particular mood, and an erotic film. The statements varied with respect to whether the content was depressing, elating or emotionally neutral. Fifteen subjects were assigned to each of the three mood induction conditions, with the first subject receiving the neutral statements, the second receiving elation statements, the third receiving depression statements, following which the sequence was begun again. The remaining subjects were assigned to mood conditions in order to match the three groups on mean Sexual Arousalability Inventory scores, as well as age, marital status, sexual orientation and frequency of sexual activity. A decision as to group assignment was made based on the questionnaire scores, and the appropriate film was selected.

Subjects were greeted with the following instructions:

Before we begin, I'd like to review the procedure and show you the lab. You will be sitting in this room and watching the TV monitor. You will see material which may affect your mood, including erotic films. I will be in the other room during most of the experiment, though I'll have to come in a few times to turn on the audio-visual equipment and to give you questionnaires. If for any reason you would like to contact me during the experiment, you can do so by pressing the intercom button. The experiment involves inserting a vaginal recording device while I wait in the other room. When you signal me, I'll come in and give you some questionnaires to fill out. Then I will turn on the video monitor and ask you to indicate your sexual arousal using a lever. You will see several films, each lasting 5 to 10 minutes.

Subjects were then asked whether they had any questions, whether any aspect of the experiment caused them to be concerned, whether they employed tampons, and whether they had ever experienced difficulty in using tampons. They

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were then asked to read and sign the consent form (refer to Appendix G). Subjects then received the following instructions regarding insertion of the vaginal photoplethysmograph.

This probe measures the amount of blood flow in the vagina by reflecting light from the vaginal walls. Insert it as you would a tampon, but less deep. The bottom of the probe should be an inch inside the vaginal opening. Signal me when you're finished by pressing the intercom button.

After inserting the vaginal probe and signaling the experimenter, subjects were asked to fill in the Sexual Arousability Inventory, the Beck Depression Inventory, the Mosher Forced Choice Guilt Inventory, the Bentler Heterosexual Experience Scale, and a questionnaire involving demographic variables such as age and marital status. The completed questionnaires were collected, and subjects were asked to lean back in a reclining chair in order to minimize movement. Subjects relaxed for 10 minutes while a baseline was obtained for vaginal blood volume.

The physiological measure was adjusted while the questionnaires were being filled out. An attempt was made to have all subjects begin with similar baseline levels of vaginal blood volume by adjusting the position knob on the pre-amplifier. Throughout the experiment, an attempt was made to deal with floor and ceiling effects by adjusting the pen position knob on the physiograph and reducing the sensitivity of the pre-amplifier a known amount. Compensation was made for these adjustments when the data were scored. For example, if the sensitivity of the

pre-amplifier had been reduced by half for a particular subject during the experiment, the raw score for that subject was doubled for the purpose of data analysis.

Before starting the film, the experimenter instructed subjects in the use of the continuous measure of sexual arousal. Subjects were asked to indicate moment to moment changes in sexual arousal using a lever, the far left indicating no sexual arousal, and the far right indicating the maximum level of sexual arousal ever experienced during erotic fantasies, or while reading or viewing erotica. All subjects viewed a 5-minute segment of "Horses on Sable Island," which depicts horses and nature scenes. Following the film, subjects filled in the Personal Feelings Scale, Form C of the Depression Adjective Check Lists, and the Thayer Activation-Deactivation Check List.

Subjects then received instructions regarding the mood induction procedure. Subjects in the elation and depression groups were given identical instructions which informed them that they would view statements designed to create a mood, and emphasized the importance of attempting to experience the mood (refer to Appendix B). Subjects in the neutral mood condition received brief instructions asking them to concentrate on statements which would appear. Subjects then viewed 40 mood induction statements, and filled out Form A of the Depression Adjective Check Lists and the Thayer Activation-Deactivation Check List. The Digit Symbol Substitution Test was then administered. Subjects were

allowed 90 seconds for this task. Subjects then viewed another ten mood induction statements in an attempt to restore the emotional state temporarily interrupted by the assessment procedure. An erotic film depicting foreplay and simulated intercourse began after the last statement. Subjects were asked to indicate moment to moment changes in sexual arousal by means of the lever during the erotic film. At the conclusion of the film, subjects filled in the Personal Feelings Scale and rated physiological sensations such as vaginal lubrication. Each testing session lasted approximately two hours.

After removal of the physiological recording devices, subjects were paid and were asked about their reactions to the experiment. Subjects were not debriefed immediately because of the possibility that students who were acquainted with them might later participate in the study. They were told that an explanation of the hypotheses would be mailed to them at a later date.

Results

Effectiveness of the Group Matching Procedure.

Subjects in the elation, depression and neutral groups were compared with respect to a number of demographic and attitudinal variables which might have influenced response to either the mood induction procedure or the erotic film. A multivariate analysis of variance was performed in order to test for possible differences between the three groups with regard to nine ordinal and interval measures, and univariate tests were also examined. The chi square statistic was employed in order to determine whether the three groups differed with respect to the frequency distributions of four nominal and dichotomous measures.

A multivariate analysis of variance was employed since the data involve several intercorrelated variables (refer to Appendix G). The dependent measures consisted of scores on the Beck Depression Inventory, the Sexual Arousability Inventory, the Bentler Heterosexual Experience Scale and the sex guilt subscale of the Mosher Forced Choice Guilt Inventory as well as age, education, phase of menstrual cycle, frequency of sexual activity and frequency of masturbation. Information on frequency of sexual activity and masturbation was missing for one subject in the depressed mood group. These data were estimated by obtaining the mean frequencies within the depressed mood group.

The results of the MANOVA indicate that there was no

significant difference between the three groups with regard to the linear combination of dependent variables, Pillai's criterion=.305, $F(18,52)=.520$, $p \geq .93$. As Table 1 shows, univariate F-tests also failed to indicate differences between the three groups on the matching variables. Means for these variables are displayed in Table 2.

Results of the chi square tests indicate that the three groups did not differ significantly with regard to the frequency distributions for marital status, $\chi^2(4)=1.703$, $p \geq .790$, whether or not the subject had children, $\chi^2(2)=2.482$, $p \geq .289$, type of contraceptive used, $\chi^2(8)=6.255$, $p \geq .619$, or sexual orientation, $\chi^2(2)=2.235$, $p \geq .327$.

Results of the MANOVA, the univariate F-tests and the chi square tests provide no evidence that the three experimental groups were selected from different populations. It may therefore be concluded that the group matching procedure was successful.

Effectiveness of the Mood Induction Procedure

In order to ascertain the effects of the three mood induction procedures, four measures of mood were analyzed using multivariate analysis of covariance, in which pretest scores were employed as covariates for posttest scores (refer to Huck and McLean, 1975). Intercorrelations between pretest and posttest scores are displayed in Appendix H. An evaluation of the assumptions of multivariate analysis of covariance is presented in Appendix K.

Table 1

Univariate F-Tests for Differences Between the Three Experimental Groups in Demographic, Attitudinal and Behavioral Measures

Variable	Hypothesis MS	Error MS	F	P
Beck Depression Inventory	.750	35.674	.021	.98
Sexual Arousability Inventory	175.000	556.144	.315	.73
Bentler Heterosexual Experience Scale	2.333	21.586	.108	.90
Mosher Forced Choice Guilt Inventory (sex guilt subscale)	54.333	75.881	.716	.50
Age	2.028	38.126	.053	.95
Level of Education	0.194	0.280	.694	.51
Phase of Menstrual Cycle	1.194	1.096	1.090	.35
Frequency of Sexual Activity	0.111	1.861	.060	.94
Frequency of Masturbation	2.694	2.187	1.232	.30

NOTE: $df = (2,33)$

Table 2
Means for Demographic, Attitudinal and
Behavioral Measures Within Each Experimental Group

Variable		Elated Group	Neutral Group	Depressed Group
Beck Depression Inventory	\bar{X} S.D.	7.0 5.3	7.5 6.1	7.3 6.4
Sexual Arousability Inventory	\bar{X} S.D.	86.4 21.6	81.4 28.4	88.9 20.0
Bentler Heterosexual Experience Scale	\bar{X} S.D.	17.0 4.2	16.3 5.6	17.2 4.0
Mosher Forced Choice Guilt Inventory (Sex Guilt Subscale)	\bar{X} S.D.	-46.9 12.1	-49.8 6.9	-51.1 5.9
Age	\bar{X} S.D.	26.5 5.5	26.4 4.8	25.8 7.8
Level of Education*	\bar{X} S.D.	1.1 0.5	1.2 0.6	1.3 0.5
Phase of Menstrual Cycle*	\bar{X} S.D.	3.8 1.1	3.3 0.9	3.8 1.1
Frequency of Sexual Activity*	\bar{X} S.D.	3.8 1.4	3.6 1.6	3.8 1.1
Frequency of Masturbation*	\bar{X} S.D.	3.4 1.6	2.5 1.4	2.8 1.5

NOTE: In the depressed group, $n = 11$ for frequency of sexual activity and masturbation. For all other means, $n = 12$.

* Numerical values for these variables were derived from the questionnaire displayed in Appendix F. Responses of "A" received a score of 1, responses of "B" received a score of 2, etc.

The dependent variables consisted of General Activation-Deactivation Sleep, High Activation-General Deactivation, the Depression Adjective Check List and the Digit Symbol Substitution Test administered after exposure to forty mood induction statements. Pretest scores for the three self-report measures of depressed mood and arousal were employed as covariates.

Missing data were treated as follows. Two subjects in the neutral group omitted one and three items on the Thayer Activation-Deactivation Check List respectively. These items were assigned a score of two, which corresponds to the category of "cannot decide." The validity of Digit Symbol Substitution Test scores was questionable for two subjects in the elation group, four subjects in the neutral group and two subjects in the depression group. In one case, due to an error of timing, a score had to be estimated. In seven cases, the subjects had skipped one or more boxes rather than filling in the boxes consecutively. The eight subjects were initially included in the MANCOVA. The analysis was then repeated with the eight subjects excluded.

The results of the MANCOVA indicated a significant difference between the three mood induction groups with regard to the linear combination of dependent variables, Pillai's criterion=.691, $F(8,56)=3.697$, $p<.002$. Univariate F-tests indicated that the three groups were significantly different from each other in post-treatment scores on General Activation-Deactivation Sleep, $F(2,30)=11.254$,

$p < .001$, and the Digit Symbol Substitution Test, $F(2, 30) = 4.694$, $p < .02$ (refer to Table 3). There were no significant differences between the three groups on High Activation-General Deactivation, $F(2, 30) = 1.536$, $p \geq .23$, or on the Depression Adjective Check List, $F(2, 30) = 2.417$, $p \geq .11$.

Contrary to expectations, mean Digit Symbol Substitution Test scores for the depressed and elated groups were nearly identical ($\bar{x} = 58.9$ and $\bar{x} = 59.6$ respectively), while lower scores were obtained by subjects in the neutral group ($x = 45.9$). The MANCOVA was repeated, excluding the eight subjects with questionable Digit Symbol Substitution Test scores. The MANCOVA showed a significant difference between the three groups in the linear combination of dependent measures, Pillai's criterion = .711, $F(8, 40) = 2.756$, $p < .02$. However, the univariate F-test did not indicate a significant difference for the Digit Symbol Substitution Test, $F(2, 22) = .975$, $p \geq .39$. These results suggest that the original difference between the three groups in Digit Symbol Substitution Test scores may have been an artifact due to the questionable quality of data obtained from eight subjects.

Further analyses of General Activation-Deactivation Sleep and Depression Adjective Check List scores were conducted. In order to clarify possible group differences on these two measures, Roy-Bargman Stepdown F-Tests were performed, varying the order of entry into the equation of

Table 3
Univariate F-tests for the Effects
of the Mood Induction Procedures on Measures of Mood

Variable	Hypothesis MS	Error MS	F	P
General Activation- Deactivation Sleep	177.815	15.780	11.254	.001
Digit Symbol Substitution Test	589.299	125.547	4.694	.017
High Activation- General Deactivation	21.792	14.185	1.536	.232
Depression Adjective Check List	40.515	16.760	2.417	.106

NOTE: $df = (2, 30)$

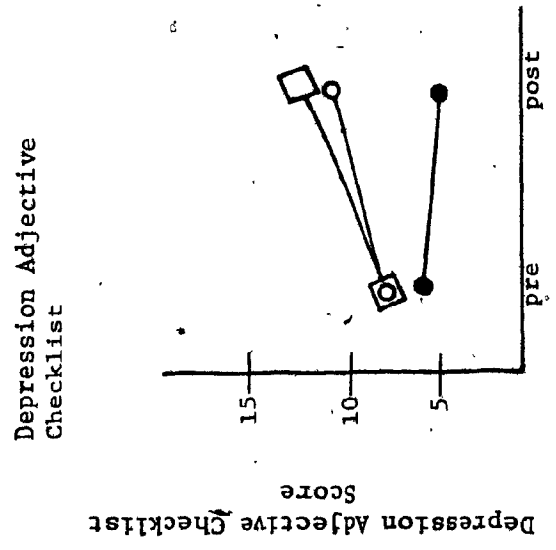
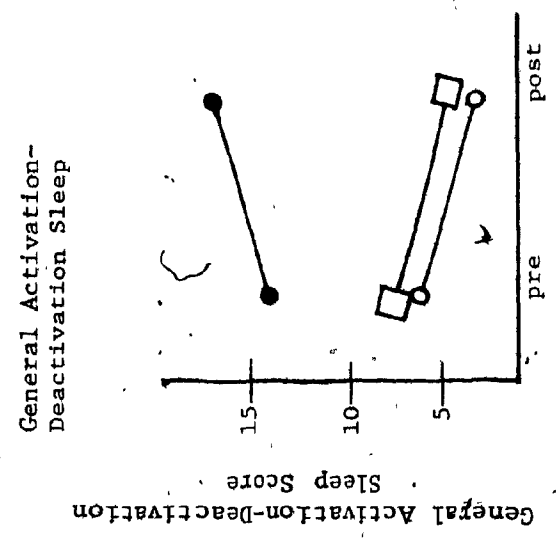
the two mood measures. When General Activation-Deactivation Sleep was entered last into the equation, a significant difference between the three groups was obtained, $F(2,27)=3.635$, $p<.04$. For the Depression Adjective Check List, a significant difference was not obtained when this variable was entered into the equation last, $F(2,27)=.028$, $p\geq.90$. However, when this variable was entered prior to General Activation-Deactivation Sleep, a significant difference emerged between the three groups, $F(2,28)=3.386$, $p<.05$. The Depression Adjective Check List and General Activation-Deactivation Sleep display a correlation of $-.73$, and share a large proportion of variance. Scores on General Activation-Deactivation Sleep and on the Depression Adjective Check List appear to differ among the three groups. However, much of the variance in Depression Adjective Check List scores produced by the mood treatment can be accounted for by the variance in General Activation-Deactivation Sleep.

Pairwise T-tests were conducted in order to compare the three groups on mean scores for the Depression Adjective Check List and General Activation-Deactivation Sleep adjusted for the three covariates. Group means for these two measures obtained before and after the mood induction treatment are displayed in Figure 1. Comparisons of mean scores on the Depression Adjective Check List indicate that the elation group was significantly different from the depression group, $t=2.187$, $p<.04$. The neutral group was not

significantly different from either the elated group, $t=1.140$, $p \geq .26$, or the depressed group, $t=1.102$, $p \geq .28$. Figure 1 suggests that both the neutral and depression groups showed an increase in self-report of depressed mood, while the elation group showed little change.

Comparisons of group means for General Activation-Deactivation Sleep indicate that the elated group was significantly different from both the depressed group, $t=3.940$, $p < .0005$, and the neutral group, $t=4.485$, $p < .0001$. There was no significant difference between the depression and neutral groups, $t=.797$, $p \geq .43$. Figure 1 suggests that the depressing and neutral mood induction treatments resulted in lower scores on General Activation-Deactivation Sleep, while the elating procedure resulted in an increase.

A series of pre-post T-tests were conducted in order to clarify the nature of the changes within each group. Scores on the Depression Adjective Check List and General Activation-Deactivation Sleep measured prior to the mood induction within each group were compared with their scores obtained after the mood induction. The results of these analyses are consistent with the changes displayed in Figure 1. The depressed mood treatment resulted in significantly higher scores on the Depression Adjective Check List, $t(11)=2.84$, $p < .02$, as well as significant changes on General Activation-Deactivation Sleep in the direction of Deactivation Sleep, $t(11)=4.17$, $p < .04$. The neutral mood treatment produced a significant increase in scores on the



● Elated
 □ Depressed
 ○ Neutral

FIG. 1: Scores on the Depression Adjective Checklist and General Activation - Deactivation Sleep Before and After the Mood Induction Treatment.

Depression Adjective Check List, $t(11)=2.51$, $p<.03$, as well as significant decreases in scores on General Activation-Deactivation Sleep, $t(11)=2.58$, $p<.03$. This represents a change in the direction of increased Deactivation-Sleep. The related mood treatment produced a significant increase in the direction of General Activation, $t(11)=-2.83$, $p<.02$, and did not affect scores on the Depression Adjective Check List, $t(11)=.84$, $p>.40$:

In summary, it seems that the depressed mood treatment increased self-report of depressed mood, as well as feelings of tiredness relative to energy. The depression induction, however, failed to produce a lowered performance on the Digit Symbol Substitution Test. Exposure to the neutral statements produced an increase in depressed mood as measured by the Depression Adjective Check List, and feelings of tiredness measured by Deactivation Sleep. The related mood induction procedure increased scores on General Activation, but not on the Depression Adjective Check List.

Data Sampling and Reduction for Vaginal Blood Volume and the Continuous Measure of Subjective Sexual Arousal

The final stage of data analysis examined genital vasocongestive changes in the three groups in response to the erotic film. Vaginal blood volume and the continuous measure of subjective sexual arousal were sampled during both the neutral travelogue and the erotic film. The travelogue was selected as a baseline for these measures for several methodological reasons. The travelogue shared

several characteristics of the erotic film. Both required subjects to watch the audio-visual monitor over a similar time interval, thus controlling for the effects of attending to visual stimuli, passage of time and individual differences in genital response. At the time of presentation of the travelogue, all subjects had been exposed to an identical procedure and were viewing the same stimulus. However, a disadvantage of employing the travelogue as a control condition proved to be the possibility of baseline drift during the interval of approximately twenty minutes which separated the end of the travelogue from the beginning of the erotic film. In order to assess the possibility of baseline drift, vaginal blood volume was also sampled during the final ten mood induction statements immediately preceding the erotic film.

A time sampling procedure was employed for both vaginal blood volume and the continuous measure of subjective sexual arousal, with data points being sampled every 12.5 seconds. Vaginal blood volume was measured in millimeters of pen deviation from an arbitrary baseline. The continuous measure of subjective sexual arousal was calculated in millimeters of pen deflection from a zero point corresponding to an absence of sexual arousal. Each measure was sampled during the first 4 minutes and 10 seconds of both the neutral and erotic film, providing 20 data points for each measure during each film. In addition, vaginal blood volume was sampled over 17 data points during the

final ten mood statements (3 minutes and 20 seconds) preceding onset of the erotic film. The individual data points were then averaged, providing mean levels of vaginal blood volume and subjective sexual arousal for the travelogue and the erotic film, as well as a mean value of vaginal blood volume during the final 10 mood statements.

Missing data were treated as follows. Data on the continuous measure of subjective sexual arousal were missing for one subject in the elation group. This subject was excluded from analyses involving this measure. Several data points for vaginal blood volume were missing for thirteen subjects, as a result of floor or ceiling effects. When floor or ceiling effects occurred, an attempt was made to adjust the position of the pen or the sensitivity of the amplifier. When only one or two adjacent data points touched the floor or ceiling, the missing data points were estimated by extending the line for vaginal blood volume before or after the missing data points. In those cases where the pen persisted for longer than 30 seconds at a floor or ceiling level, data points were assigned scores corresponding to the floor or ceiling. The number of missing data points are summarized in Appendix I.

Baseline Drift: Vaginal Blood Volume Levels during the Travelogue versus the End of the Mood Procedure

In order to assess the possibility of baseline drift, a correlated T-test was performed, comparing mean levels of vaginal blood volume for all subjects during the travelogue

and the last ten mood induction statements. There was a significant difference between mean vaginal blood volume during the travelogue and the final ten mood induction statements, $t(35)=3.10$, $p<.004$, indicating significant upward movement during a period of approximately 20 minutes. It seemed necessary to take this phenomenon into account in assessing the effectiveness of the erotic film, since an increase in vaginal blood volume relative to the travelogue might in part be attributed to baseline drift. This was done by selecting a baseline in closer temporal proximity to the erotic film. Vaginal blood volume during the erotic film was compared with two baseline measures to be described in the next section.

Effectiveness of the Erotic Film in Inducing Sexual Arousal

In order to assess the effectiveness of the erotic film in inducing sexual arousal, the travelogue and the erotic film were compared with respect to mean levels of subjective sexual arousal as measured by the self-monitoring device and vaginal blood volume. Mean levels of these two measures at each data point sampled are displayed in Figures 2 and 3. Visual inspection suggests that both measures of sexual arousal showed an increase during the erotic film. The results of correlated T-tests indicate significant differences between the two films with regard to both the subjective measure, $t(34)=6.28$, $p<.001$, and the physiological measure, $t(35)=7.27$, $p<.001$. In order to guard against the possibility that the increase in vaginal

blood volume from the travelogue to the erotic film was due to upward baseline drift, mean vaginal blood volume during the erotic film was compared to mean vaginal blood volume during the last 10 mood induction statements immediately preceding the onset of the erotic film. A significant difference between mean vaginal blood volume levels during the mood statements and during the erotic film was obtained, $t(35)=4.63$, $p<.001$, suggesting that baseline drift alone could not explain the increase in vaginal blood volume during the erotic film. Although alpha errors are somewhat inflated since three T-tests were performed, the results strongly suggest that the erotic film was effective in inducing both subjective and physiological sexual arousal. This is consistent with the results displayed in Figures 2 and 3.

Effects of the Elation, Depression and Neutral Mood
Induction Procedures on Response to Erotica

Once again, a multivariate analysis of covariance was employed to assess the effects of the mood induction treatments on subsequent response to erotica. The dependent variables consisted of four measures of response to the erotic film, while the covariates involved measures obtained prior to presentation of the erotic film. The correlations between the covariates and the dependent measures are displayed in Appendix J. Evaluation of the assumptions of multivariate analysis of covariance is presented in Appendix K.

Means for the Continuous Measure of Subjective Sexual Arousal Measured by Millimeters of Pen Deviation for the Entire Subject Sample

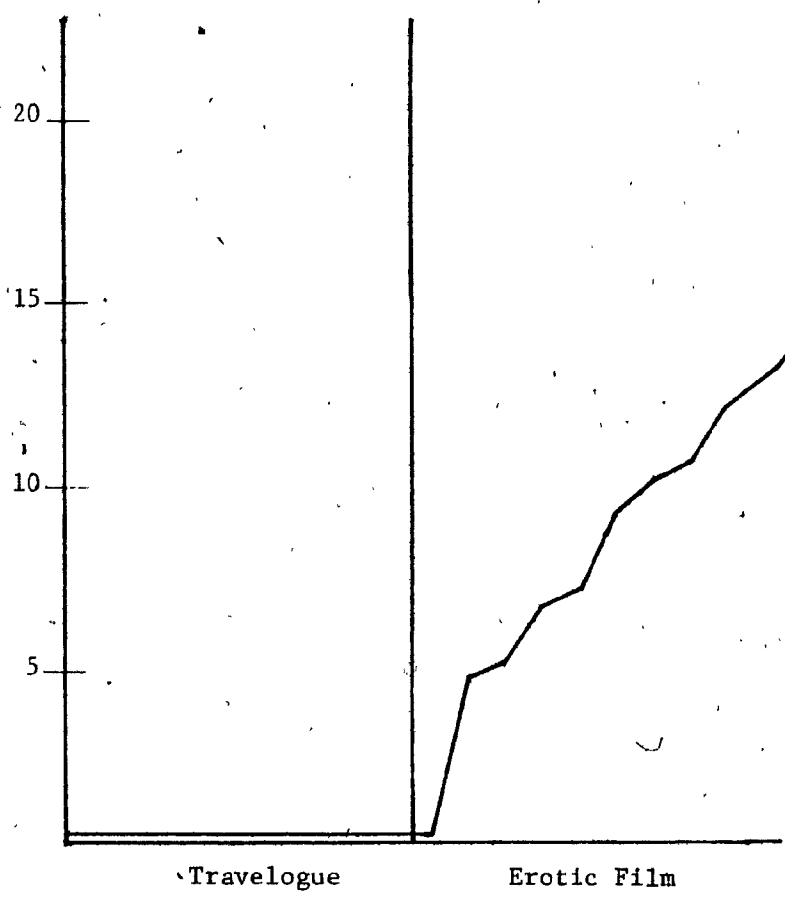


FIG 3. Means for the Continuous Measure of Subjective Sexual Arousal Measured by Millimeters of Pen Deviation During the Travelogue and Erotic Film.

The four measures of response to the erotic film were vaginal blood volume, the continuous measure of subjective sexual arousal, and scores for Positive Affect and Negative Affect. The covariates consisted of the travelogue baseline scores on the same measures with the exception of the continuous measure of subjective sexual arousal. The continuous measure was not included as a covariate because most subjects did not move the lever during the travelogue. Furthermore, the correlation between scores on this measure obtained during the travelogue and the erotic film achieved a value of only .24. The Sexual Arousability Inventory was selected as a covariate because of its correlation of .57 with the continuous measure of subjective sexual arousal.

Results of the MANCOVA indicate that there were no significant differences between the three groups with regard to the four measures of sexual arousal, Pillai's criterion=.068, $F(8,52)=.228$, $p \geq .98$. The hypothesis that the mood induction treatment would affect subsequent response to erotica was not supported.

Multiple Regression of the Effects of Individual Differences in Mood on Response to Erotica

Although the hypothesis that the mood induction treatment would affect subsequent response to erotica failed to receive support, further exploration of the relationship between mood and response to erotica was carried out. In the previous analysis of the effects of the mood induction treatments on response to erotica, mood was operationalized

in terms of three categories: elated, depressed and neutral. This method of data analysis might have obscured a relationship between mood and response to erotica if the treatment did not generate sufficiently intense mood states or if there were large variations in mood within each group. Multiple regression was employed in order to provide a finer analysis of predictability of response to erotica.

To test the hypothesis that response to erotica might be related to some of the mood measures obtained during the experiment, subjects were collapsed into one group and two multiple regression analyses were conducted. The dependent measures consisted of change scores for vaginal blood volume and the continuous measure of subjective sexual arousal respectively. Change scores, rather than absolute scores, were employed in order to control for potential expectancy effects associated with viewing erotica. In order to calculate change scores on each measure, the mean score obtained during the travelogue was subtracted from the mean score obtained during the erotic film. In both cases, the predictor variables included the Beck Depression Inventory, as well as scores on General Activation-Deactivation Sleep, High Activation-General Deactivation, and the Depression Adjective Check List obtained after the mood induction treatment. Measures of mood obtained after, rather than before the mood treatment, were employed since they were closer in time to the erotic stimulus and took into account the possibility that the mood treatment may have had some

effect. A stepwise hierarchical solution was employed, with the Beck Depression Inventory scores being entered into the equation first in order to reflect the causal ordering among the predictor variables.

None of the measures of mood showed a significant correlation with the continuous measure of subjective sexual arousal. There was a significant correlation between vaginal blood volume and High Activation-General Deactivation, $r = -.35$, $p < .05$ (refer to Table 5), suggesting that prior tension was associated with a smaller increase in vaginal blood volume. In the case of subjective sexual arousal, General Activation-Deactivation Sleep did not meet minimal statistical criteria for entry into the equation. The multiple regression was not significant in the case of either subjective sexual arousal, $R = .236$, $F(3, 31) = .608$, $p \geq .61$ (refer to Table 4), or vaginal blood volume, $R = .402$, $F(4, 31) = 1.457$, $p \geq .22$ (refer to Table 5). This suggests that the linear combination of measures of mood was not useful in predicting response to erotica.

e. Multiple Regression of the Effects of Demographic Variables, Sexual Responsiveness and Experience on Response to Erotica

Multiple regression was employed in order to test the hypothesis that subjective and physiological response to erotica could be predicted from various sexual attitudinal and behavioural measures. The physiological measure of erotic response consisted of change scores for VBV in order to control for individual differences in initial level of

Table 4

Regression of the Continuous Measure
of Subjective Sexual Arousal on Measures of Mood

Variable	Multiple R	Increase in R^2	F for Increase	Beta	F for Beta	Zero-order r
Beck Depression Inventory	.09	.01	.287	.34	.277	-.09
Depression Adjective Check List	.23	.04	1.489	-.232	1.381	-.23
High Activation- General Deactivation	.24	.00	.094	-.058	.942	-.10

Table 5

Regression of Vaginal Blood Volume on Measures of Mood

Variable	Multiple R	Increase in R ²	F for Increase	Beta	F for Beta	Zero - order r
High Activation General Deactivation	.35*	.12	4.798	-.254	1.027	-.35*
Beck Depression Inventory	.38	.02	.722	.138	.491	-.00
General Activation Deactivation Sleep	.38	.00	.120	-.286	.692	-.21
Depression Adjective Check List	.40	.02	.592	-.260	.592	-.05

* p < .05

VBV. Again, mean VBV levels during the travelogue were subtracted from mean VBV levels during the erotic film. For the continuous measure of subjective sexual arousal, absolute scores were employed instead of gain scores. Unlike VBV, the subjective measure had a clearly defined zero point, making the use of absolute scores feasible.

For the multiple regression on both the physiological and subjective measures, a stepwise hierarchical solution was employed in order to reflect causal ordering among the predictor variables. Subjects' age and phase of menstrual cycle were entered into the equation first in a stepwise solution. Scores on the Sexual Arousability Inventory, the Bentler Heterosexual Experience Scale and the sex guilt subscale of the Mosher Forced Choice Guilt Inventory, as well as sexual orientation, frequency of sexual activity and frequency of masturbation were entered next, again in a stepwise solution.

The results of the multiple regression were not significant for VBV, $R=.42$, $F(7,27)=.824$, $p \geq .58$. The Sexual Arousability Inventory scores did not meet minimal statistical criteria for acceptance into the equation. None of the correlations between VBV and the predictor variables achieved significance, $p \geq .05$.

The linear combination of predictor variables was significantly related to the continuous measure of subjective sexual arousal, $R=.798$, $F(8,25)=.547$, $p < .001$. The results of the multiple regression are displayed in

Table 6, and correlations among the predictor variables in Appendix G. The Sexual Arousability Inventory emerged as the single best predictor of subjective sexual arousal, accounting for an increment of 28% in the amount of variance explained, $F(3,30)=13.374$, $p<.001$. The Bentler Heterosexual Experience Scale accounted for an additional 13% of the variance, $F(5,28)=9.028$, $p<.006$. This measure probably acted as a suppressor variable because of its zero correlation with subjective sexual arousal and high correlations with the Sexual Arousability Inventory, $r=.39$, and frequency of sexual activity, $r=.46$. Sexual orientation accounted for 9% of the variance, $F(4,29)=5.035$, $p<.033$. Bisexual subjects indicated higher levels of subjective sexual arousal than did heterosexual subjects. Phase of menstrual cycle accounted for 8% of the variance, $F(1,32)=2.892$, $p<.10$.

In order to further clarify the relationship between the continuous measure of subjective sexual arousal and the various predictor variables, the multiple regression was repeated twice, varying the order of entry into the equation of the predictor variables. This procedure potentially changes the results for the various predictors. The first time, the variables were entered in a stepwise solution, in which order of entry was determined by predictive power, with the most powerful predictors being entered first (refer to Table 7). The Sexual Arousability Inventory was selected as the first variable to enter the equation. It accounted

Table
 Regression of the Continuous Measure of Subjective Sexual Arousal
 on Demographic Variables and Measures of Sexual Responsiveness and Experience

Variable	Multiple R	Increase in R ²	F for Increase	Beta	F for Beta	Zero-order r
Phase of Menstrual Cycle	.29	.08	2.892*	.323	4.735**	.29
Age	.29	.00	.029	-.207	2.684	-.02
Sexual Arousability Inventory	.61	.28	13.374***	.535	11.186**	.59
Sexual Orientation	.68	.09	5.035**	.501	8.676**	.34
Bentler Scale of Sexual Experience	.77	.13	9.028**	-.254	2.283	-.00
Frequency of Sexual Activity	.78	.02	1.162	-.233	2.182	.02
Mosher Forced Choice Sex Guilt Inventory	.79	.01	1.221	.131	.863	-.08
Frequency of Masturbation	.80	.01	.712	.140	.712	.48

* p < .10
 ** p < .05
 *** p < .001

Table 7
 Regression of the Continuous Measure of Subjective Sexual Arousal¹
 on Demographic Variables and Measures of Sexual Responsiveness and Experience

Variable	Multiple R	Increase in R ²	F for Increase	Beta	F for Beta	Zero-order
Sexual Arousability Inventory	.59	.35	17.320***	.535	11.186**	.59
Frequency of Masturbation	.66	.08	4.333**	.140	.712	.48
Frequency of Sexual Activity	.69	.04	2.228	-.233	2.182	.02
Sexual Orientation	.71	.03	1.778	.501	8.676**	.34
Phase of Menstrual Cycle	.74	.05	3.275*	.323	4.735**	.29
Bentler Scale of Sexual Experience	.76	.03	1.947	-.254	2.283	-.00
Age	.79	.04	2.821	-.207	2.684	-.02
Mosher Forced Choice Sex Guilt Inventory	.80	.02	.863	.131	.863	-.08

* p < .10
 ** p < .05
 *** p < .001

1 A stepwise solution was employed

for 35% of the variance in the subjective measure of sexual arousal, $F(1,32)=17.320$, $p<.001$. Frequency of masturbation, which was selected for entry second, accounted for an additional 8% of the variance, $F(2,31)=4.333$, $p<.05$. Phase of menstrual cycle accounted for a 5% increment in the amount of variance explained, displaying a trend towards significance, $F(4,29)=3.275$, $p<.08$. The other predictor variables each accounted for less than 4% of the variance, and did not achieve statistical significance, $p\geq.05$.

The multiple regression procedure was repeated, with the Sexual Arousability Inventory scores being forced into the equation last (refer to Table 8). This procedure has the effect of reducing the predictive power of the Sexual Arousability Inventory, since this measure could only account for the variance which remained unexplained by the other predictor variables. The Sexual Arousability Inventory was the seventh predictor to be entered. Even then, this measure accounted for 15% of the variance, $F(7,26)=10.384$, $p<.003$. Frequency of masturbation was entered into the equation first, and accounted for 23% of the variance, $F(1,32)=9.340$, $p<.004$. Frequency of sexual activity acted as a suppressor variable, accounting for a significant 9% increase in the amount of variance explained, $F(4,29)=4.421$, $p<.05$. This measure showed a negligible positive correlation with the criterion, and a nonsignificant Beta weight, $Beta=-.233$, $p\geq.15$. Its contribution to the predictive power of the linear

Table 8

Regression of the Continuous Measure of Subjective Sexual Arousal
on Demographic Variables and Measures of Sexual Responsiveness and Experience¹

Variable	Multiple R	Increase in R ²	F for Increase	Beta	F for Beta	Zero- order r
Frequency of Masturbation	.48	.23	9.380**	.140	.712	.48
Phase of Menstrual Cycle	.53	.05	2.121*	.323	4.734**	.29
Sexual Orientation	.59	.08	3.509**	.501	8.676**	.34
Frequency of Sexual Activity	.66	.09	4.421	-.233	2.182	.02
Age	.69	.03	1.785	-.207	2.684	-.02
Bentler Scale of Sexual Experience	.69	.00	.115	-.254	2.283	-.00
Sexual Arousability Inventory	.79	.15	10.384**	.535	11.186**	.59
Mosher Forced Choice Sex Guilt Inventory	.80	.01	.863	.131	.863	-.08

*p < .10
**p < .05
***p < .001

¹ The Sexual Arousability Inventory was forced in last

combination of variables was probably due to its correlation with frequency of masturbation, $r=.37$. Frequency of sexual activity appeared to replace the Bentler Heterosexual Experience Scale as a suppressor variable. The latter accounted for less than 1% of the variance. Sexual orientation accounted for 8% of the variance, displaying a trend towards significance, $F(3,30)=3.509$, $p<.07$. None of the other predictor variables accounted for more than 5% of the variance, $p\geq.05$.

Results of the multiple regression analysis suggest that the Sexual Arousability Inventory is a strong predictor of subjective response to erotica. Sexual orientation, phase of menstrual cycle and frequency of masturbation may contribute in predicting subjective response to erotica. The Bentler Heterosexual Experience Scale and frequency of sexual activity may increase prediction by acting as suppressor variables for the Sexual Arousability Inventory and frequency of masturbation respectively. Age and sex guilt add little to prediction.

Discussion

The principle hypotheses of this study were that exposure to the depressed mood induction would reduce subsequent response to erotica, while exposure to the elated mood treatment would exert a facilitative effect. The effects of the mood induction procedure were equivocal, and the results did not support the hypotheses with regard to either the physiological or subjective measures of sexual arousal. There appear to be several possible explanations for these results. One possibility might be that sexual arousal is unrelated to moods such as depression and elation. In the case of depression, this would appear unlikely in view of clinical anecdotal evidence suggesting that depression reduces sexual interest (Kaplan, 1974), as well as Wolchik et al.'s (1980) finding that exposure to a film creating depression and anger reduced subsequent response to erotica in males.

The effects of elated moods on subsequent response to erotica have received little attention in the literature. It was hypothesized that induction of a prior elated mood might lend itself to cognitive labeling processes which would exert a facilitative effect on subsequent response to erotica. This hypothesis was not supported by the results. Although this might suggest that elation does not affect sexual arousal, such a conclusion would probably be premature.

The most likely explanation for the absence of

differences in response to erotica among the three groups can probably be found in terms of the effectiveness of the mood induction procedure. The method developed by Velten (1968) appears to produce consistent differences between groups receiving the elated, depressed and neutral statements when self-report measures of mood are employed. However, effects on behavioural measures appear to be less consistent. Polivy and Doyle (1980) concluded that although these effects are influenced by experimental demand characteristics, a genuine mood change also appears to result from this mood induction for many subjects. However, this mood may be quite mild and transient. In the present study, the measures of mood provided only equivocal support for the effectiveness of this procedure. As expected, the depressed mood induction resulted in increased self-report of depressed mood and feelings of tiredness. However, the hypothesis that depressed mood induction would also increase self-report of the arousal dimension of tension was not supported. The elated mood treatment resulted in increased self-report of feelings of energy, but did not affect ratings of depression or calmness. This suggests that the elated mood treatment was ineffective. The three groups did not differ with regard to the behavioural measure. Viewed in the context of other studies employing Velten's (1968) mood induction technique, the self-report and behavioural data suggest that the elated mood statements exerted little or no effect, while the depressed mood statements created

temporary, mild depressed states.

It seemed likely that induction of a more intense depressed mood would have inhibited response to erotica. Wolchik et al. (1980) found that exposure to a film inducing depression and anger reduced subsequent response to erotica in males. It is possible that this film created stronger feelings of depressed mood than did the technique employed in the present study. Perhaps depressed mood must reach a certain intensity before it begins to exert an inhibitory effect on subsequent response to erotica. The discrepancy between the results of the present study and those of Wolchik et al. (1980) emphasizes the importance of employing standardized mood inducing stimuli and measuring their effects. Response to erotica may be affected differently depending on the qualitative aspects of the prior mood, as well as its intensity.

The multiple regression analysis of the effects of prior ratings of mood on subjective and physiological responses to erotica provided little evidence that individual differences in self-report of depressed mood and the arousal dimension of General Activation-Deactivation Sleep might be associated with enhanced response to erotica through the effects of cognitive labeling. However, it is also possible that the range of levels of depressed mood and feelings of tiredness within the subject sample was insufficient to demonstrate a relationship between response to erotica and these two dimensions of mood.

There was some evidence in the present study of a correlation between feelings of calmness as opposed to tension and physiological response to erotica. This is consistent with Roviario and Holmes' (1980) finding that threat of electric shock inhibited subjective response to erotica, but contradicts Hoon et al.'s (1977) finding that anxiety facilitated subsequent physiological responses to erotica. It is possible that the construct of tension measured by Thayer's (1978b) Activation-Deactivation Checklist more closely resembles the kind of tension induced by Roviario and Holmes' (1980) technique. It is possible that tension inhibits response to erotica under some circumstances, perhaps by distracting subjects from attending to the erotic stimulus.

The results of the multiple regression of the effects of demographic variables, sexual responsiveness and sexual experience on VBV indicate little if any relationship between the measures of individual differences and physiological response to erotica. This is inconsistent with Wincze et al.'s (1976) finding that VBV was correlated with day in menstrual cycle, frequency of intercourse and scores on the Sexual Arousalability Inventory. This discrepancy may have been partly due to the nature and small number of subjects tested by Wincze et al. (1976), who tested only twelve subjects. However, since this sample included six women who were sexually dysfunctional and six women who did not report sexual difficulties, it is possible

that this sample provided a wider range of scores than the sample employed in the present study, in which an attempt was made to exclude women with sexual problems.

The results of the multiple regression of the effects of demographic variables and measures of sexual experience and responsiveness on subjective response to erotica indicate that the continuous measure of sexual arousal in response to the erotic film was related to several measures of individual differences. The Sexual Arousability Inventory emerged as the strongest predictor of subjective response to erotica. One possible explanation for this relationship might involve common method variance, as both measures involve self-report. However, this would appear unlikely, as the Sexual Arousability Inventory is a questionnaire asking subjects to predict their sexual arousal under various circumstances, while the continuous measure is a lever indicating momentary fluctuations in sexual arousal. The relationship between the Sexual Arousability Inventory scores and subjective response to erotica cannot be explained exclusively in terms of common method variance. This suggests that response to erotica is related to sexual arousal under other circumstances, and provides important support for the validity of the continuous measure, which is increasingly being employed.

The results of the multiple regression provide support for Kinsey's (1953) hypothesis that, among females, frequency of masturbation would be a more valid indicator of

sexual interest than frequency of interpersonal sexual activity. Frequency of masturbation appeared to be a stronger predictor of subjective response to erotica than measures of interpersonal sexual activity. The latter were not correlated with response to erotica, and in fact acted as suppressor variables. These results, if replicable, would suggest that, consistent with Kinsey's (1953) hypothesis, heterosexual activity provides a poor measure of sexual interest among females as females rarely initiate. However, one might speculate that an alternative explanation might be found in terms of the stimulus situation. The situation of viewing erotica appears to resemble masturbation more closely than interpersonal activity, since both involve solitary sexual stimulation. More research is necessary in order to clarify the relationship between these three variables.

Sexual orientation and phase of menstrual cycle predicted subjective response to the erotic film, although the predictive power of these two variables was rather weak. Storms' (1980) hypothesis suggests that bisexuals show similar responses to erotica depicting heterosexual activities as would heterosexuals. The present study suggests that bisexuals may be more responsive to erotica than are heterosexuals. This might be due to the characteristics of the sample, as few bisexuals were tested. However, it might also indicate that bisexuals show a stronger response to erotica, since they are responsive to a

wider range of cues. There was also a tendency for females in the latter phase of the menstrual cycle to indicate higher levels of subjective response to erotica. This may reflect increased sexual arousal due to hormonal factors.

The present study raises several methodological points. Since the Sexual Arousability Inventory emerged as the strongest predictor of subjective response to erotica, this questionnaire constitutes an extremely useful and efficient measure on which to match subjects in studies involving response to erotica. In contrast to the Sexual Arousability Inventory, response to a prior neutral film does not appear to provide a useful reference point for subjective response to erotica, as few subjects reported sexual arousal while viewing the travelogue. The present study also raises the possibility that baseline drift might introduce error into the measurement of VBV, suggesting caution in employing baselines which are separated from the erotic stimulus by a fairly long period of time. The present study also emphasizes the importance of employing powerful mood induction procedures and specifying their effects. In order to clarify the effects of mood states on subsequent response to erotica, it would be useful to compare mood states varying systematically in intensity as well as in emotional quality, such as depression, anxiety and anger.

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Appendix A

Description of Experiment Read to Subjects
During Initial Telephone Contact

"First, let me tell you in more detail what the experiment involves. Then you can decide whether you are interested in participating. I am looking at women's reactions to various films. Some of the films involve neutral content, while others are erotic. Some are designed to create moods such as happiness and sadness. I will also be asking you to fill in questionnaires such as sexual history, sexual attitudes, and background information, and also to rate your mood at various points during the experiment. The experiment also involves two physiological measures. One is a measure which is attached to your hand. The other is a vaginal recording device, which is about the size and shape of a tampon. Inserting it feels like inserting a tampon. I ask people to wear a skirt or a dress, and not to come when they are menstruating. There are two rooms in the laboratory, so you will insert the vaginal recording device and watch the films in privacy. From time to time, I will come in to turn the TV on and off, and to give you questionnaires to fill out. There is a wire connecting the vaginal recording device to equipment in the other room. This wire will go from beneath your skirt into the next room. The vaginal recording device is sterilized after each use according to a procedure approved by medical authorities. However, there may be minimal risk of contracting an infection equivalent to the risk involved in a medical examination. How does it sound?

Appendix B

Instructions for the Elated and Depressed Mood Statements

You will soon be shown a series of statements. As each one appears, read it first to yourself and then out loud. These statements represent a certain mood. Your ability to experience this mood will be largely a question of your willingness to be receptive and responsive to the idea in each statement, and to allow each idea to act on you without interference. First, as each statement is placed before you, simply read it to yourself, and then read it once out loud in a manner appropriate to its intended seriousness. Then go over each statement again and again in your head with the determination and willingness to believe it. Really experience each idea. Concentrate your full attention on it. Exclude other ideas which are unrelated to the mood, like "I'll see if this will work". Try to respond to the feeling suggested by each item. The statements will be sentences such as "I feel rather thoughtful at the moment. My thoughts are far away." Some people simply repeat the statements over and over again to themselves with the intention of experiencing them. Some people find it natural and easy to visualize a scene in which they had or would have had such a feeling or thought. Perhaps some combination of repeating the statements and imagining scenes will come to you. Very likely, you will begin to feel the way you do when you're in that mood. A certain amount of time will be devoted to each statement. Continue to concentrate your full consciousness on retaining the mood as each statement appears. To sum up, the whole purpose of this part of the experiment is to see whether a person can

Appendix B Continued

talk herself into a mood. Although some of these mood statements may have no relation to anything you have ever thought, said, or done, concentrate on accepting and feeling these emotions rather than comparing each single statement to your life experience and then deciding whether it applies to you. At first you may feel the impulse to compare a single mood statement to your life experience, or to resist statements which seem contradictory to what you feel yourself to be. But, most people feel this at first. It will become apparent to you that if you're able to talk yourself into a mood, then obviously you know how to talk yourself out of one. If you find you can do these things, then you will learn something valuable about yourself. You can learn to control your moods to an extent. If you feel the urge to laugh, it will probably be because humor is a good way to counteract unwanted feelings or it might be because you are surprised that you really are going into the mood. Try to avoid these reactions, however, by keeping in mind that you have a chance of acquiring extremely useful information about yourself and how to help yourself out of undesirable moods that occur in everyday life.

The series of statements will now begin. Remember to read each statement first to yourself, and then read it out loud. Try to really experience the mood.

Appendix C

Statements for Neutral Treatment Subjects

1. Oklahoma City is the largest city in the world in area, with 631.166 square miles.
2. Japan was elected to the United Nations almost fourteen years after Pearl Harbor.
3. At the end appears a section entitled "Bibliography Notes".
4. We have two kinds of nouns denoting physical things: Individual and mass nouns.
5. This book or any part thereof must not be reproduced in any form.
6. Some streets were still said to be listed under their old names.
7. The system is supervised by its board of regents.
8. There is a large rose-growing center near Tyler, Texas.
9. Many states supply milk for grammar school children.
10. It is God's will that the fittest survive.
11. The typography, paper, and bind were of the highest quality.
12. The machine dominated county posts for as long as anyone could remember.
13. The desk was old, and scratched into its surface was a profusion of dates, initials, and pleading messages.
14. The Orient Express travels between Paris and Istanbul.
15. When the banyan bent down under its own weight, its branches began to take root.
16. There isn't a scientific explanation for every U.F.O. sighting.
17. The Hope Diamond was shipped from South Africa to London through the regular mail service.

Appendix C Continued

18. The review is concerned with the first three volumes.
19. The ship was ancient, and would soon be retired from the fleet.
20. Slang is a constantly changing part of the language.
21. There is a small article in the local newspaper which indicates acceptance of the kidnappers' terms.
22. There are some forms in which no oath is required.
23. Intramatics finds mates for the lonely.
24. 99.1% of Alaska is owned by the federal government.
25. Two men dressed as repairmen will appear shortly after the van pulls up.
26. The wood was discolored as if it had been held in a fire.
27. A light was noticed in the dark outside, and it moved eerily towards the house.
28. Painting in a few other non-European countries is treated in a separate volume.
29. A recent study revealed that one half of all college students were unable to find summer jobs.
30. Provoked arousal and orientation are accompanied by steeper negative shifts.
31. The names on the Christmas mailing list are alphabetically ordered.
32. Significantly, these changes occur during the full moon.
33. West Samoa gained its independence in 1965.
34. The magazine's report was slanted, as usual.
35. The map would prove useless as a beginning guide.
36. The speaker outlined a plan whereby the current deficits could be eliminated.

Appendix C Continued

37. Black and white pictures are arranged in ten sections.
38. The voices come only at night, and whisper words, terrible words.
39. The papers had been front-paging it for days.
40. Potter wrote numerous satires on social cynicism.
41. Boeing's main plant in Seattle employs 35,000 people.
42. The doorkeeper was dressed in red.
43. During the next ten years, the group participated in politics.
44. The organization depended on the people for support.
45. In 1965, Elizabeth made the first state visit by a British monarch to Germany in 56 years.
46. It was their sixth consecutive best seller.
47. It all fitted in with the officer's story.
48. The merger did not change the company's policy.
49. The mansion was rented by the delegation.
50. Ninety occupations were listed as eligible for the grads in business.

Appendix D

Mood Statements for Depression

Treatment Subjects

1. Today is neither better nor worse than any other day.
2. However, I feel a little low today.
3. I feel rather sluggish now.
4. Sometimes I wonder whether school is all that worthwhile.
5. Every now and then I feel so tired and gloomy that I'd rather just sit than do anything.
6. I can remember times when everybody but me seemed full of energy.
7. People annoy me; I wish I could be by myself.
8. I've had important decisions to make in the past, and I've sometimes made the wrong ones.
9. I do feel somewhat discouraged and drowsy-----maybe I'll need a nap when I get home.
10. Perhaps college takes more time, effort, and money than it's worth.
11. I just don't seem to be able to get going as fast as I used to.
12. There have been days when I felt weak and confused, and everything went miserably wrong.
13. Just a little bit of effort tires me out.
14. I've had daydreams in which my mistakes kept occurring to me-----sometimes I wish I could start over again.
15. I'm ashamed that I've caused my parents needless worry.
16. I feel terribly tired and indifferent to things today.
17. I'm getting tired out. I can feel my body getting exhausted and heavy.

Appendix D Continued

18. I'm beginning to feel sleepy. My thoughts are drifting.
19. At times I've been so tired and discouraged that I went to sleep rather than face important problems.
20. My life is so tiresome-----the same old thing day after day depresses me.
21. I couldn't remember things well right now if I had to.
22. I just can't make up my mind; it's so hard to make simple decisions.
23. I want to go to sleep-----I feel like just closing my eyes and going to sleep right here.
24. I'm not very alert; I feel listless and vaguely sad.
25. I've doubted that I'm worthwhile person.
26. I feel worn out. My health may not be as good as it's supposed to be.
27. It often seems that no matter how hard I try, things still go wrong.
28. I'm uncertain about my future.
29. I'm discouraged and unhappy about myself.
30. I've lain awake at night worrying so long that I hated myself.
31. Things are worse now than when I was younger.
32. The way I feel now, the future looks boring and hopeless.
33. My parents never really tried to understand me.
34. I have the feeling that I just can't reach people.
35. Things are easier and better for other people than for me. I feel like there's no use in trying again.
36. Often people make me very upset. I don't like to be around them.

Appendix D Continued

- 37. It takes too much effort to convince people of anything. There's no point in trying.
- 38. I fail in communicating with people about my problems.
- 39. It's so discouraging the way people don't really listen to me.
- 40. I've felt so alone before, that I could have cried.
- 41. I just don't care about anything. Life just isn't any fun.
- 42. Life seems too much for me anyhow-----my efforts are wasted.
- 43. I'm so tired.
- 44. I don't concentrate or move. I just want to forget about everything.
- 45. I have too many bad things in my life.
- 46. Everything seems utterly futile and empty.
- 47. I feel dizzy and faint. I need to put my head down and not move.
- 48. I don't want to do anything.
- 49. All of the unhappiness of my past life is taking possession of me.
- 50. I want to go to sleep and never wake up.

Appendix E

Mood Statements for Elation

Treatment Subjects

1. Today is neither better nor worse than any other day.
2. I do feel pretty good today, though.
3. I feel light-hearted.
4. This might turn out to have been one of my good days.
5. If your attitude is good, then things are good, and my attitude is good.
6. I've certainly got energy and self-confidence to spare.
7. I feel cheerful and lively.
8. On the whole, I have very little difficulty in thinking clearly.
9. My parents are pretty proud of me most of the time.
10. For the rest of the day, I bet things go really well.
11. I'm pleased that most people are so friendly to me.
12. My judgment about most things is sound.
13. It's encouraging that as I get farther into my major, it's going to take less study to get good grades.
14. I'm full of energy and ambition-----I feel like I could go a long time without sleep.
15. This is one of those days when I can grind out schoolwork with practically no effort at all.
16. My judgment is keen and precise today. Just let someone try to put something over on me.

Appendix E Continued

17. When I want to, I can make friends extremely easily.
18. If I set my mind to it, I can make things turn out fine.
19. I feel enthusiastic and confident now.
20. There should be opportunity for a lot of good times coming along.
21. My favorite song keeps going through my head.
22. Some of my friends are so lively and optimistic.
23. I feel talkative-----I feel like talking to almost anybody.
24. I'm full of energy, and am really getting to like the things I'm doing on campus.
25. I'm able to do things accurately and efficiently.
26. I know good and well that I can achieve the goals I set.
27. Now that it occurs to me, most of the things that have depressed me wouldn't have if I'd just had the right attitude.
28. I feel so vivacious and efficient today-----sitting top of the world.
29. I'm optimistic that I can get along very well with most of the people I meet.
30. I'm too absorbed in things to have time for worry.
31. I'm feeling amazingly good today!
32. I am particularly inventive and resourceful in this mood.
33. I feel superb! I think I can work to the best of my ability.
34. Things look good! Things look great!
35. I feel that many of friendships will stick with me in the future.
36. I can find the good in almost anything.

Appendix E Continued

37. I feel an exhilarating animation in all I do.
38. I feel highly perceptive and refreshed.
39. My memory is in rare form today.
40. In a buoyant mood, like this one, I can work fast and do it right the first time.
41. I can concentrate hard on anything I do.
42. My thinking is clear and rapid.
43. Life is so much fun; it seems to offer so many sources of fulfillment.
44. Things will be better and better today.
45. I wish somebody would play some good loud music.
46. This is great-----I really do feel good. I am elated about things.
47. I'm really feeling sharp now.
48. This is just one of those days when I'm ready to go!
49. I feel like bursting with laughter-----I wish somebody would tell a joke and give me an excuse!
50. God, I feel great!

Appendix F

Questionnaire for Demographic Variables

Please answer the following questions by filling in the blank or putting a check in the appropriate place.

- 1) What is your age? _____
- 2) What is your marital status?
 - a) single _____
 - b) married or living with someone _____ If so, for how long? _____
 - c) separated or divorced _____ If so, how long ago? _____
 - d) other - please specify _____
- 3) Have you had children?
 - a) Yes _____
 - b) No _____
- 4) What is your current level of education?
 - a) Undergraduate _____
 - b) Graduate _____
- 5) Are you enrolled in a part-time or full-time program?
 - a) Part-time _____
 - b) Full-time _____
- 6) What subject are you majoring in? _____
- 7) Do you have a job at the present time?
 - a) Part-time _____
 - b) Full-time _____
 - c) No job _____
- 8) How many days have passed since day one of your last menstrual period?
 - a) I am currently menstruating _____
 - b) 1 - 7 days _____
 - c) 8 - 14 days _____
 - d) 15 - 21 days _____
 - e) 22 - 28 days _____

Appendix F Continued

- 9) What type of contraceptive device do you use?
- a) None _____
 - b) The pill _____
 - c) The IUD _____
 - d) The diaphragm _____
 - e) Other _____
- 10) What is your sexual orientation?
- a) Heterosexual _____
 - b) Bisexual _____
 - c) Homosexual _____
- 11) Considering the last 6 months, how many times per month on the average have you engaged in sexual activity with a partner?
- a) Not at all _____
 - b) Once _____
 - c) Between two and four times _____
 - d) Between five and eight times _____
 - e) Over eight times _____
- 12) Considering the last 6 months, how many times per month on the average have you masturbated to orgasm?
- a) Not at all _____
 - b) Once _____
 - c) Between two and four times _____
 - d) Between five and eight times _____
 - e) Over eight times _____

Appendix G

Correlation Matrix for Demographic Variables and Measures of Sexual Responsiveness and Experience

	1	2	3	4	5	6	7	8	9
Beck Depression Inventory									
Sexual Arousal Inventory									
Bentler Heterosexual Experience Scale									
Mosher Forced Choice Inventory (sex guilt subscale)									
Age									
Level of Education									
Phase of Menstrual Cycle									
Frequency of Sexual Activity									
Frequency of Masturbation									

Note: rs for variables 1 to 7 are based on ns = 36.
 rs for variables 8 and 9 are based on ns = 35.
 * p < .10
 ** p < .05
 *** p < .01

Appendix H

Correlation Matrix for Measures of Mood Obtained Before and After the Mood Induction Procedure

		Pretest			Posttest			
		1	2	3	4	5	6	7
1	Depression Adjective Checklist							
2	General Activation-Deactivation Sleep							
3	High Activation-General Deactivation							
4	Depression Adjective Checklist							
5	General Activation-Deactivation Sleep							
6	High Activation-General Deactivation							
7	Digit Symbol Substitution Test							
1			-.30**	.55***	.59***	-.30**	.45**	-.14
2				.15	-.65***	.86***	.25*	.15
3					.22*	.06	.59***	.10
4						-.73***	.23*	-.09
5							.30**	.26*
6								-.00
7								

Note: n = 36

- * p < .10
- ** p < .05
- *** p < .001

Appendix I

Number of Missing Data Points for Vaginal Blood Volume
 in the Three Groups During Travelogue,
 Last Ten Mood Statements and Erotic Film

	Subject Number	Travelogue	Last Ten Mood Statements	Erotic Film
Elated	2		3	
Group	3	1		
	7		11	2
	10	4		
Depressed	3	1		
Group	8			3
	12		11	
Neutral	2	1		
Group	3		7	
	4		1	
	7			2
	9		11	

Appendix J

Correlation Matrix for Measures of Sexual Arousal Administered Before and After Onset of the Erotic Film

	Measures Administered Before Erotic Film				Measures Administered After Onset of the Erotic Film			
	1	2	3	4	5	6	7	8
Sexual Arousal Inventory								
1								
2								
3								
4								
5								
6								
7								
8								

Note: rs with the Continuous Measure of Subjective Sexual Arousal are based on n = 35. All other rs are based on n = 36.

* $p < .10$
 ** $p < .05$
 *** $p < .01$

Appendix K

Evaluations of Statistical Assumptions

In testing the effectiveness of the mood induction procedure, the assumptions of multivariate analysis of covariance were evaluated with the following results. Box's M Multivariate Test of Homogeneity of Dispersion Matrices was not significant, $F(56,3110) = .825$, $p \geq .816$, indicating that the assumption of homogeneity of variance-covariance matrices was met. Multivariate analysis of variance indicated that there was no significant difference between the three groups with regard to the covariates, Pillai's criterion = .275, $F(6,64) = .1700$, $p \geq .135$. However, examination of univariate F-tests indicated a significant difference between the three groups with regard to pretest scores for General Activation-Deactivation Sleep, $F(2,33) = 5.739$, $p < .01$. The effect of violation of this assumption would be to increase the probability of finding a significant difference in posttest scores for this measure. The multivariate factor by covariate interaction did not attain significance, Pillai's criterion = .696, $F(24,96) = .843$, $p \geq .675$, indicating that the assumption of homogeneity of regression coefficients was met.

In testing the effectiveness of the elation, depression and neutral mood induction procedures on response to erotica, the assumptions of multivariate analysis of covariance were evaluated

with the following results. The multivariate analysis of variance indicated that the three groups were not significantly different with regard to the values of the covariates, Pillai's criterion = .174, $F(8,62) = .657$, $p \geq .65$. Box's Multivariate Test of Homogeneity of Dispersion Matrices did not indicate significant heterogeneity of variance-covariance matrices, $M = 140.653$, $F(72,2811) = 1.129$, $p \geq .10$. Cochran's C Univariate Homogeneity of Variance Test indicated significant heterogeneity of variance for scores for Negative Affect, $C(11,3) = 1.752$, $p < .001$. However, scores for vaginal blood volume, the continuous measure of subjective sexual arousal and Positive Affect did not violate the univariate assumption of homogeneity of variance, $p \geq .05$. The multivariate factor by covariate interaction did not reach significance, Pillai's criterion = .829, $F(32,80) = .653$, $p \geq .90$, indicating that the assumption of homogeneity of regression coefficient was met.