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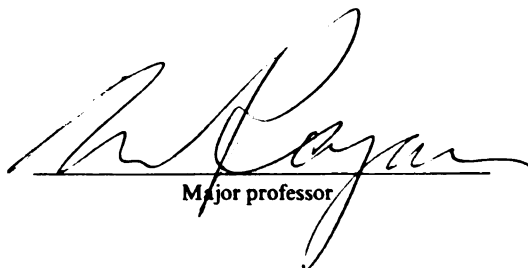
PHYSIOLOGICAL AND PHENOMENOLOGICAL REACTIONS TO  
EROTIC STIMULI IN POST-MASTECTOMY WOMEN  
AND MATCHED CONTROLS

presented by

Dianne Marie Gerard

has been accepted towards fulfillment  
of the requirements for

Ph.D. degree in Counseling and  
Educational Psychology

A handwritten signature in dark ink, appearing to read "R. K. Ryan". Below the signature is a horizontal line, and underneath that line, the words "Major professor" are printed in a small, sans-serif font.

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By

Dianne Marie Gerard

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## ABSTRACT

### PHYSIOLOGICAL AND PHENOMENOLOGICAL REACTIONS TO EROTIC STIMULI IN POST-MASTECTOMY WOMEN AND MATCHED CONTROLS

By

Dianne Marie Gerard

Twenty-four Caucasian and Oriental women, aged 34 to 57, from Hawaii were studied to determine the effect of mastectomy on later sexual functioning, relationship between physiological and subjective sexual arousal, self-concept, and relationship to mate. This expands sexuality research to middle-adult women, Orientals, and mastectomees, thus broadening understanding of sexual functioning and avoiding total reliance on self-report and retrospective data. Thirteen mastectomees and 11 controls completed questionnaires about body image, physiological changes during sexual arousal, self-concept, and sexual arousability, and were interviewed; 10 subjects per group were presented an erotic film and two seductive audiotapes, while vaginal pressure pulse was recorded via photoplethysmograph and subjective reactions were reported.

It was hypothesized that (a) controls would show stronger positive relationship between physiological sexual arousal and self-reports than mastectomees; (b) mastectomees would report fewer positive body attitudes and less arousal to various sexual behaviors than controls; (c) with time, mastectomees would display more emotional adjustment,

reflected in greater congruence between physiological and phenomenological sexual arousal; and (d) the more erotic the stimulus, the greater the reported arousal.

Results indicate that though both groups responded similarly and most strongly to the erotic film, only controls had significant correlation between physiological and subjective indices of arousal. No differences were found between groups in self-esteem, body cathexis, awareness of physiological changes during sexual arousal, coital or orgasm frequency, satisfaction with sexual responsiveness, or perceived attractiveness. Racial differences were not noted. Mastectomees with breast reconstruction, unlike those without, reported greater arousal to more erotic stimuli and rated themselves as more satisfied with their sexual responsivity and attractiveness. Time was insignificant in increasing emotional adjustment post-mastectomy after the initial adjustment. Denial as a psychological defense mechanism among mastectomees was discussed; implications for treatment and research were suggested. Use of volunteers and small sample size were cited as limitations.

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## CHAPTER I

### INTRODUCTION

This is a study of the effect of mastectomy on women's sexual functioning. Women who have had breast cancer and subsequent mastectomy were compared with similarly aged married women to assess their physical and emotional reactions to erotic video and audio materials; their feelings about self, attractiveness and body image; and their perceptions of their sexuality and relationships with men.

In 1981 the American Cancer Society announced that they expected about 110,450 new cases of breast cancer and that at some time in their lives 9% of all American women would develop breast cancer. The breast is the leading site of cancer incidence and death among women (1981 Cancer Facts and Figures, 1980). Epidemiologically, female breast cancer has its highest incidence in the western world (North America and Western Europe) and is the most prevalent type of malignancy in the United States (Baker, 1977). It also is the leading cause of all deaths among women 40 to 44 years old. The significance of this disease reaches far beyond the medical and surgical aspects, yet surprisingly little research has been done to assess the psychological, emotional, sexual, and relationship ramifications.

Largely because of public education regarding monthly breast self-examination, there is earlier detection of breast cancer, and



consequently, women are living longer after mastectomies. If breast cancer is detected before it has spread to the lymph nodes, there is an 85% five-year survival rate. For mastectomized women the spectre of early death presents potentially serious trauma to self-image and psychosexual functioning. Little is known about the needs of mastectomy patients for support, education, and counseling pre- and post-mastectomy.

Feelings of mutilation, grief over loss of a prominent and sexually valued body part, and fears of continuing cancer are usually faced by the woman who discovers she has mammary cancer. This type of cancer occurs most often in women in later child-bearing years and in menopausal years (predominantly in ages 37-60 years), which likely coincides with other developmental losses and transition points. This is the time of the "empty nest" syndrome, menstruation and further child-bearing potential are ending, new roles may be required, and a shift or reorganization in the marital relationship often occurs. In the Western culture, breasts are intimately associated with sexual attractiveness; consequently, the mastectomized woman's sexual relationship(s) likely will be negatively affected. Theoretically, good sexual relations within a marriage or similar intense relationship tend to enhance that relationship.

The meta-theory of this research project is as follows: Women, following the removal of one or both breasts as a result of cancer, usually develop negative attitudes toward their bodies which in turn affect their relationships with their sexual partners and which affect their sexual functioning and sexual feelings.

Physicians, nurses, psychotherapists, and counselors need to assess their roles in aiding mastectomized women through understanding the psychological and sexual ramifications of breast surgery and in planning educational and/or therapeutic programs for women facing such surgery as well as for those who have experienced it. Research is needed to build a sound theoretical and clinical basis for such programs.

### Purpose

The purpose of this research was to determine the relationship between mastectomy (the surgical removal of one or both breasts) and sexual arousal in a group of post-mastectomy female patients. Both physiological and phenomenological reports of arousal to erotic and seductive stimuli were obtained from groups of post-mastectomy and no-mastectomy married women, similar as a group for race, age, and years married. Data on pre- and post-mastectomy feelings about body image and attractiveness, self-concept, and sexual functioning were obtained as indications of psychosexual adjustment and the effect of mastectomy on sexual functioning.

### Hypotheses

The following hypotheses were tested.

Because women tend to react with greater sexual arousal to explicit rather than subtle erotic stimuli (Heiman, 1977; Jakobovits, 1965; Osborn & Pollack, 1977), it was hypothesized that:

1. There would be greater vaginal pressure pulse reactivity to the erotic film than to the seductive audiotapes.

2. There would be greater reported perceived sexual arousal to the erotic film than to the seductive audiotapes.

3. Heart rate would differ during the three stimulus presentations.

Because size and shape of breasts are emphasized in Western culture as a basic and highly valued esthetic quality of women, it was hypothesized that: (4) Women who have experienced a mastectomy will have a poorer body image than women who have not had a mastectomy.

Women who have not experienced mastectomy will indicate the relative degrees of their bodily sexual arousal changes with greater consistency and accuracy than will post-mastectomy women. Therefore, it was hypothesized that: (5) "Normal" women (nonmastectomized) will have a more positive correlation between their bodily reactions to erotic stimuli and their subjective perceptions of sexual arousal than will mastectomees. Even though mastectomized women will have certain physiological changes that can be measured validly and reliably relative to their state of sexual arousal upon being presented with erotic and seductive stimuli, they will tend to deny their body signals and report being less aroused than their physiological reactions indicate.

Because there have been inconclusive findings in the literature as to the relationship between cognitive and physiological indices of sexual arousal in females (Geer, Morokoff, & Greenwood, 1974; Heiman, 1977; Hoon, 1979; Morokoff & Heiman, 1980; Osborn & Pollack, 1977; Wincze, Hoon, & Hoon, 1977), more research needs to be done to clarify the relationship.

Because of the trauma of the discovery of cancer and subsequent mastectomy, there would likely be some effect on women's ability to become aroused and to sexually enjoy a variety of erotic activities. Thus, it was hypothesized that: (6) Women who have not had mastectomies would report greater sexual responsivity as measured by the Sexual Arousability Inventory than would mastectomees, and that: (7) Such women would also report more awareness of the physiological changes that accompany sexual arousal than would mastectomees.

As time passes post-surgery the mastectomized woman becomes increasingly adjusted to her figure and less fearful of recurrent cancer; thus, she is likely able to relax more and allow herself to emotionally and cognitively acknowledge sexual feelings. Consequently, it was hypothesized that: (8) An increase in the time since the mastectomy will result in a higher positive correlation between physiological and phenomenological indices of sexual arousal when women who have had a mastectomy within the last  $2\frac{1}{2}$  years are compared to women who had mastectomies more than  $3\frac{1}{2}$  years ago.

### Theory

Three components are required for sexual arousal to occur: (a) physiological changes such as increased vasocongestion in the genitalia, (b) subjective perception of these physiological changes, and (c) cognitive labeling of these physiological changes as sexual. Sexual arousal can be impeded by problems in any or all of these components (Rook & Hammen, 1977; Walen, 1980).

Sexual adjustment is in part a function of one's body image. Women who undergo mastectomies experience a radical change in their bodies since until recently the most common treatment was radical mastectomy in which the breast, tissues, muscles, and the axillary lymph nodes are surgically removed. The psychological effects of mastectomy differ from those of other surgical procedures because of the sexual ramifications of the lost breast. Western culture is breast- and appearance-oriented; thus Western women are conscious of breasts as symbols of their attractiveness (Jesser, 1971; Sontag, 1972). Removal of the breast can be experienced as mutilation and a threat to femininity.

Reconstructive surgery using breast implants has been tried by some women, but the majority of mastectomized women do not elect this procedure. Instead most use a breast prosthesis. This gives the appearance of "normalcy" in everyday life. However, within the intimacy of the sexual relationship, the woman must confront her disfigurement and the reactions of her sexual partner. One wonders what effects altered body image and feelings about femininity have on sexual responsivity. It may be assumed that engaging in sexual relations brings the woman's awareness of her disfigurement into sharp focus not only because the breasts are central erotic areas but also because of her concerns about her partner's reactions to her. This may affect her ability to relax and fully abandon herself to the erotic experience. She may feel anxious, worried about how she looks, concerned about rejection by her partner, etc. This may be increased even more in single women who do not have on-going relationships; with

each new partner there may well be a resurgence of fears about acceptance and rejection.

Helen Singer Kaplan (1974, 1979) described sexual dysfunctions as arising from anxiety, which can have either immediate or remote causes. Immediate causes are factors creating an "anti-erotic" atmosphere which ruins the sexual responsivity between the partners. Negative self-focus could interfere with sexual arousal and fulfillment.

Women may escape from such anxieties by denying being sexually aroused. Physiologically, they may become aroused but they may psychologically deny this to avoid anxiety. If this is the case, the negative attitudes provided by avoidance of anxiety may powerfully support denial of sexual arousal and lead to sexual dysfunction.

To summarize, it is hypothesized that equivalent women who have or have not had mastectomy will differ with respect to their attitudes toward the attractiveness of their bodies, which in turn will affect attitudes toward self, their sexual partners, and toward sex. The changed body image and attitudes toward self render mastectomized women, consciously or unconsciously, sexually neutral or negative; this then affects their perception of sexual arousal to erotic stimuli and may also affect the satisfaction derived from their sexual experiences.

#### Basic Assumptions

The assumptions made in this research are as follows:

1. Anxiety (such as anxiety about attractiveness and sexual desirability) may interfere with sexual arousal in females (Kaplan, 1974, 1979).

2. There is a relationship between a woman's body image and her sexual responsiveness. Because Western cultures tend to emphasize external appearance as a prime indicator of beauty and link beauty with sexual desirability, there is likely a relationship between the perception a woman has of her body and its attractiveness and her ability to relax and allow herself to become sexually aroused. (Fisher, 1973).

3. Satisfying sexual relations enhance a relationship; thus research on sexuality can lead to theory regarding ways to improve intimate relationships.

4. There is some positive relationship between sexual responsiveness in a laboratory setting and sexual responsiveness in the real world.

5. The women subjects in this research were assumed to respond sexually in ways which are essentially similar to women in general.

6. Insufficient sexual arousal in women is characterized by lack of or low-level awareness of physical changes occurring in the body (Kaplan, 1974).

7. Sexual arousal in females is initially indicated physiologically by increases in vaginal vasocongestion (Masters & Johnson, 1966).

8. The genitals are the most accurate and specific place to physiologically measure sexual arousal (Hoon, 1979; Zuckerman, 1971).

9. Erotic films are sexually arousing to females (Morokoff & Heiman, 1980; Mosher, 1973; Mosher & Abramson, 1977; Schmidt, 1975; Schmidt & Sigusch, 1970).

### Definition of Terms

Body image: The perceptions one has of the body (surface, depth, appearance, etc.) and to attitudes (emotions and personality reactions) toward the body (Traub & Orbach, 1964).

Mastectomy: Surgical removal of one or both breasts; this may include breast tissue and/or underlying musculature and axillary lymph nodes.

Sexual arousability: The "capacity to become sexually aroused in the presence of some form of erotic stimulus" (Hoon, 1979, p. 4). Arousal is characterized by physiological changes, perception of these changes, and labeling them as sexual.

Vaginal photoplethysmograph: A tampon-sized acrylic cylinder which is inserted into the vagina to measure changes in vasocongestion (blood flow, pressure pulse, heart beat). Changes in vasocongestion are determined by light reflected from an incandescent light source within the acrylic cylinder to the walls of the vagina and then back to the enclosed photocell. Recordings of these changes are made on a graph. The photoplethysmograph is battery operated.

Vaginal pressure pulse: Reflection of "distensibility of the vascular bed in response to changes in blood pressure resulting from the heart forcing blood into the arterial system" (Geer, Morokoff, & Greenwood, 1974, p. 561).

Vaginal vasocongestion: Increased blood flow to the tissues of the vagina due to sexual arousal. In this research, the vasocongestion was measured by vaginal pressure pulse.



### Delimitations

No attempts other than those which have already been made were included to increase the generalizability of the research findings. The results apply to the specific women included in this study but have implications for women in general. However, specific generalizations to all women will require further replication. There was no attempt to follow up the subjects at this stage of the research.

Because of the sensitive nature of this research (area of sexuality) and because of potential reticence of women beyond college age and of non-Caucasian ethnicity to participate in such research, it was difficult to achieve a random sample. Trends, then, are noted and suggestions made as to specific areas for future research in other locales, with subjects of different ages and ethnicity, and at different times in history.

### Overview

The bulk of this study covers the research design and the analysis of the results. In Chapter II, the relevant literature on female sexuality, mastectomy, and reactions to erotica is discussed. Questions and problems are cited regarding prior similar research to facilitate the design of a more thorough research project. Methodology, instrumentation, and procedures are presented in Chapter III. Analysis of the data and their results constitute Chapter IV. A final exploration of the meaning of the results, their generalizability, and implications for treatment planning and further research occurs in Chapter V. Appendices of various instruments and tables are included at the end of this dissertation.

## CHAPTER II

### REVIEW OF THE LITERATURE

Many topical areas need to be addressed to provide a solid background in which to understand the problem of this research. Although there has been widespread interest in sexuality for thousands of years, scientific studies of sexual behavior, attitudes, and problems have only rather recently been attempted. In this review, the areas to be presented include: (a) the history of sex research; (b) the specific areas within the field of such research which apply to the current topic, such as psychological reactions to mastectomy, psychology of body image, females' and males' reactions to erotic stimulus exposure, and physiological measures of sexual arousal; (c) the most pertinent and similar experimental studies to the present research; and (d) problems inherent in sex research.

#### History of Sex Research

Few surveys of sexual behavior occurred before Louis M. Terman published his study on marital behavior in 1938. This was followed by the Kinsey, Pomeroy and Martin (1948) research on male sexual behavior and the Kinsey, Pomeroy, Martin, and Gebhard (1953) research on female sexual behavior. These studies used large samples and primarily counted frequencies of various types of sexual behaviors in attempts to collect normative data. Caucasian samples were used,

thus curtailing the generalizability of their results to other races and non-Western cultures. Large-scale surveys of sexual behavior have been reported in the 1970s (Fisher, 1973; Hite, 1976; Hoon & Hoon, 1978; Hunt, 1974). These have tried more specifically to delineate nuances of sexual behavior in addition to counting frequencies. Other sex researchers have focused on variables such as pleasure and satisfaction, physiological responsivity, attitudes, arousability preferences, sexual dysfunctions, and reactions to erotica. The move, then, is toward a more comprehensive understanding of sexuality in its behavioral, cognitive, affective, and interpersonal complexities rather than "who does what how often."

Terman (1938) was primarily concerned with psychological factors in marital satisfaction; sexual functioning, specifically incidence of orgasm, was but one facet of his research. In a sample of 760 married women, 8% ( $n = 63$ ) were found to be anorgasmic; another 25% were rarely orgasmic. Such "orgasm inadequacy" was found to have little or no relationship to sources and amount of sex education, premarital attitudes toward sex, parental attitudes toward the subject's early sex curiosity, amount of conflict with parents, childhood discipline, strictness of religious training, amount of education, or amount of association with males during adolescence (p. 407). Only diminished responsiveness and lack of emotional zest or vigor were associated with orgasm inadequacy. Duration of penetration during coitus bore only slight association to orgasm inadequacy (penetration lasting seven minutes or less).

Correlates of sexual arousability were not addressed as was true in all early sex research. Orgasm and coital frequency were viewed as the only objective measures of female sexual response, so were used exclusively to determine a woman's degree of overall sexual responsivity. If she had an orgasm, she was aroused; if not, she wasn't. Only recently have sex therapists discussed situations in which arousal and orgasm are present, but sexual-emotional satisfaction is lacking (Apfelbaum, 1977; Jayne, 1981; Kaplan, 1977, 1979; Sharpe, Kuriansky, & O'Connor, 1976).

Kinsey et al. (1953) viewed masturbation frequency rather than intercourse frequency as the significant measure of a female's level of interest in sexual expression, because in their sample heterosexual activities were more often male initiated; thus, coitus did not provide as good a measure of the woman's innate sexual interests and capacities as did frequency of masturbation. Interestingly, there were no significant differences found in this study between married and single women on this dimension: single women masturbated on the average of one time per three weeks, while married women masturbated one time per month. Sixty-two percent of their sample had masturbated during their lives, 58% to orgasm. Speed of orgasm in masturbation was similar between men and women. This helped put to rest the notion that women are physiologically slower than men in their sexual response. Of 2,114 women, 45% experienced orgasm in three minutes or less and another 25% in four to five minutes, while males averaged about three minutes. Masters and Johnson's data (1966) supported this finding. In sexual activities with another person, women were

found to be more easily distracted than males and needed continuous stimulation to maintain and progress in sexual arousal. This latter point was reiterated by Mary Jane Sherfey (1966). Kinsey et al. (1953) believed that distraction accounted for women's slower sexual response in coitus.

The Kinsey et al. data relied completely on self-reports; thus, the subjectivity and retrospective nature of the reported findings became major criticisms. The data reported the variety and frequencies of sexual behaviors but said little about psychological or physiological aspects of sexual response.

Shere Hite (1976) analyzed questionnaires from 3,019 women (a 3% return rate, thus raising serious questions about the generalizability of her findings) about their sexuality. Much emphasis was placed on orgasm, especially whether direct clitoral stimulation was routinely employed during coitus. She included open-ended questions to ascertain what women felt was arousing, their likes and dislikes, and their attitudes about sexual relations. Her results suggested that 30% of women experience orgasm regularly during penetration without simultaneous direct clitoral stimulation, while 70% use direct clitoral stimulation. This supports the idea that coital orgasm (a "look Ma, no hands" orgasm--Barbach, 1975) is less the norm than previously assumed and that clitoral stimulation during penetration may be more the norm than a dysfunction. Kaplan (1974) hypothesized that perhaps 50% of orgasmic women do not have orgasm during coitus without direct clitoral stimulation.

Morton Hunt (1974), in an attempted replication of the Kinsey et al. (1953) research, sampled 2,026 Caucasian married women. One dimension was the proportion of marital coitus resulting in orgasm (no mention was made as to whether direct clitoral stimulation was used or whether he included the occurrence of orgasm in the overall sexual encounter versus only during penetration). Fifty-three percent had orgasm all the time during marital intercourse, 21% three-quarters of the time, 11% half the time, 8% a quarter of the time, and 7% never or almost never.

Seymour Fisher (1973) published the most intensive psychological study of female orgasm and sexual response. He studied 285 married women volunteers, aged 21-45 years. He found that a woman's evaluation of her overall degree of sexual responsiveness was related to consistency of orgasm, orgasm strength, and her actual and preferred intercourse frequencies (p. 223). Thirty-nine percent experienced orgasm with high consistency, 55% had orgasms irregularly, and 5% failed to orgasm. "The prime difference between women who are high and low in orgasmic consistency concerns their anxiety about losing what they love" (p. 227). Women with low orgasm consistency were anxious about the perceived lack of permanence of their love objects; they felt that lovers were not dependable and they were preoccupied with the possibility of being separated or abandoned. Etiologically, the fathers of these women were psychologically or literally absent. Personality types or traits and psychological disturbance were not significantly correlated with lack of orgasm consistency.

Despite all the research and emphasis on female orgasm, few attempts have been made to describe and understand the complex nature of sexual arousal and satisfaction in women (Fisher, 1973; Jayne, 1981). Emily Hoon and Peter Hoon (1978) described three styles of sexual responsivity and satisfaction in 370 American and Canadian women of upper socioeconomic status:

1. Women who had frequent intercourse and orgasm with a cohabiting partner but who did not necessarily report satisfaction with their sexual responsivity.

2. Older women without partners who expressed a liking for erotica, direct genital stimulation, and frequent masturbation but who were dissatisfied with their sexual responsivity.

3. Women who were aware of physiologic changes during sexual arousal, who enjoyed seductive sexual activities such as breast and genital stimulation, and who were most satisfied with their sexual responsivity.

They concluded that "sexual satisfaction seems to be more directly linked to women who enjoy and experience gently seductive erotic activities, breast stimulation, and genital stimulation and who are aware of the nuances of physiologic changes during sexual arousal" (Hoon, 1979, p. 25).

A review of sex research must clearly include the work of William Masters and Virginia Johnson, who had a catalytic effect on research and theory on human sexuality. In the 1950s, they began to study the physiological sexual responses of men and women in a laboratory setting. Data on nearly 10,000 sexual acts (coitus and

masturbation under a variety of conditions) were reported in Human Sexual Response (1966). Subjects were all volunteers. This experimental process led to some theories regarding the physiological nature of sexual response, and it served to generate ideas for treatment. In 1970, they published their treatment approaches and data on therapy for sexually dysfunctional couples. As their work progressed, there was more emphasis on the relationship variables involved in sexual inadequacy and somewhat less on the physiological and technical aspects.

Helen Singer Kaplan (1974, 1979) expanded both the theory of the nature of sexual response (namely that it is tri-phasic with (a) a desire phase, (b) a lubrication-swelling or vasocongestive phase, and (c) an orgasm phase) and on the therapy for sexual dysfunction by examining and addressing the psychological roots underlying sexual inadequacy and marital conflict.

Although much of the recent work in sexuality has focused on the rapid treatment of sexual dysfunction, there have been few empirical studies testing or supporting the theoretical underpinnings of the treatment modalities. There is little evidence other than the uncontrolled Masters and Johnson data (1966, 1970) to support the claims of the efficacy of sex therapy; there are limited data specifying which factors in treatment are necessary or sufficient. Douglas Hogan (1978), in a review of the sex-therapy literature, recommended outcome studies which consider the interaction of client variables, treatment components, and modes of therapy using factorial designs. In addition, more information is required to understand the



interactions of physiological, cognitive, and affective variables in sexually functional and dysfunctional subjects. Populations other than college sophomores and healthy couples in their 20's and 30's deserve attention. Further research on the relationships between physiological arousal and subjective perception of arousal would generate theory and treatment for women (and men) who report dissatisfaction in their sexual relations.

#### Psychological Reactions to Mastectomy

The major studies on the psychological reactions to breast cancer and mastectomy occurred in the mid-1950s when there was interest in finding psychodynamic personality patterns of cancer patients and in the 1970s with the "coming out" of some mastectomized women, such as Betty Ford, Marvella Bayh, "Happy" Rockefeller, and Jacqueline Susann. Tarlau and Smalheiser (1951) pioneered this work and concluded via Rorschach and Draw-a-Person projective tests that breast cancer patients were much less sexually expressive than women with cervical cancer. The impression of sexual repression in women with diagnosed breast cancer was supported by Bacon, Renneker, and Cutler (1952), Greer and Morris (1975), and Wheeler and Caldwell (1955).

The Chicago Tumor Institute published three studies on the personality dynamics of mastectomy patients. Such patients were found to (a) usually have inhibited sexuality, (b) have fewer or no children, (c) have an overly close relationship with the mother which concealed unresolved conflict, (d) have inhibitions in expressing aggression, and (e) they tended to camouflage anger with pleasantness or masochism

(Bacon et al., 1952; Renneker & Cutler, 1952; Renneker, Cutler, Hora, Bacon, Bradley, Kearney, & Cutler, 1963). Wheeler and Caldwell in their research (1955) partially supported these conclusions especially with regard to inhibited early sexual expression, but did not find substantial personality differences between women with breast or cervical cancer.

Attempts were made to link personality attributes with subsequent development of cancer. Reznikoff (1955) found that women who developed malignancies tended to have experienced more sibling deaths in childhood, had greater responsibilities for child care during childhood, had less successful marriages, had more negative feelings toward pregnancy and birth, and had disturbances in feminine identification when compared to women who did not have malignancies. Chronic or acute depressions usually preceded the cancer (Renneker et al., 1963). Greer and Morris (1975) found that there were no associations between previous stress, use of denial, and depression and the incidence of cancer. However, there was a positive correlation between diagnosis of breast cancer and "abnormal release of emotions" (suppression of anger  $p < .0001$  and suppression of other feelings  $p < .0002$ ; extreme expression of anger  $p < .02$ ); they could not speculate whether this abnormal expression of affect was antecedent to or concomitant with breast cancer. There has been no consensus on the possible causal relationship between personality dynamics and the development of cancer.

Mastectomized women have a dual adjustment: accepting the loss of the breast plus the possibility of further invasion of cancer.

Approximately half of the women who underwent mastectomy reported depression and/or anxiety (Ray, 1977; Roberts, Furnival, & Forrest, 1972). The intensity of the depression depended greatly on how much importance was placed on the sexual aspects of the breast and on the woman's reactions to her mortality (Klein, 1971). This latter point was strongly supported by Rose Kushner (1975): "The single biggest psychological adjustment a woman must make is to the sudden knowledge that she has a chronic, potentially fatal disease and that removing the breast is only the first step in trying to stop the malignant spread" (p. 235).

Contrary to this was Mildred Hope Witkin's (1978) view. In interviews with 41 post-mastectomy women, she found that the sexual role and functioning were the central issues in psychological recovery. Katz, Weiner, Gallagher, and Hellman (1970) concluded that the cosmetic issue of the breast loss seemed more consciously threatening to 30 pre-biopsy women than the possibility of malignant disease. Perhaps issues of mortality and the quality of life post-mastectomy were and continue to be complexly intertwined, thus interfering with researchers' attempts to prioritize their relative importance.

Fears of mortality diminished only with passing time--five to ten years of time--and the lack of recurrence of cancer. During this period, other concerns developed. Feelings of loss of femininity and mutilation were predominant (Asken, 1975). There were worries about sexual attractiveness and desirability, effects on the marriage and on sexual relations (Goldsmith & Alday, 1971). The views of Kushner and Witkin may not be contradictory but may simply reflect

the assessment of women's psychological needs at different times in the recovery period; such different views of the relative importance of life versus sexual functioning may also stem from the different emphases of the authors themselves, as both had experienced mastectomy.

Leis (1971) reported on the ambivalence felt toward the remaining breast, the lack of body symmetry, and the alternating overvaluation of the breast as a symbol of femininity and motherhood and the negative valence attached to it as a constant reminder of potential death and sexual mutilation.

Little has been written regarding the specifically sexual adjustment of the post-mastectomy patient other than that she questions and has fears about her attractiveness and sexual desirability. Klein (1971) believed that three steps were necessary for return to psychological equilibrium post-mastectomy: acceptance of the loss of the breast by full mourning of the loss, reintegration of a self-image worthy of love and the rewards of life, and acceptance of the possible recurrence of the cancer. Sexuality was only hinted at in the concept of redeveloping a positive self-image. Witkin (1975), on the other hand, in her discussion of treatment, stressed the importance of squarely facing the sexual mutilation by urging the couple to begin intercourse in the first few days home after surgery. She believed that this affirmed the woman's sense of being loved and desired by her partner and bolstered her knowledge that she was loved for herself rather than for her appearance. Wellisch (1980) reported a UCLA study of mastectomized women who were on the average 22 months

post-surgery; 20% had not shown the surgical site to their husbands. The importance of the husband's involvement in recovery and his emotional support was emphasized by Ervin (1973).

Jamison, Wellisch, and Pasnau (1978), in a unique study, investigated the responses of 41 post-mastectomy women and the male partners of 31 of them. Twenty-four percent of the women rated their sexual satisfaction worse after the mastectomy (12% rated it better and 63.5% reported no change). The male partners indicated that sexuality and intimacy were severely stressed post-mastectomy; sexual satisfaction was judged to have lessened somewhat. The researchers concluded that the post-mastectomy sexual relationship seemed "exquisitely responsive to the general state of the relationship before the procedure, as well as to the strain of the mastectomy itself" (p. 546). That is, those men with negative feelings about the relationship before the mastectomy tended to become more negative in their views post-mastectomy. It also seemed as if the women were downplaying the negative effects of the mastectomy on their sexual relations.

### Body Image

Body image refers to the perceptions one has of one's body and also to attitudes toward the body (Traub & Orbach, 1964). These researchers defined body image specifically as the picture a person had of the physical appearance of his/her body. Paul Schilder described the body image as "not merely a mental picture of the bodily self; it is the core and essence of the whole personality" (Schontz, 1977, p. 307). This restated Sigmund Freud's position in

1927 that "the ego is first and foremost a body ego" (p. 31).

Further, it is assumed that an intimate relationship exists between physical health and body image (Kurtz & Hirt, 1970).

Assumptions have been made that the concept of the body influences behavior; the more definite the body boundaries, the more one is "person" oriented, spontaneous in expressing feelings, more comfortable with intimacy, and tending to have a greater desire for sexual relations (Fisher & Cleveland, 1958). In a study of patients with physical symptoms, Fisher and Cleveland (1956) found that people with physical symptoms on the exteriors of their bodies had different body concepts than those with interior body symptoms. "Exteriors" conceived of the body as having an "impermeable sheath" (barrier) whereas "interiors" viewed their bodies as easily penetrated. The researchers concluded that these attitudes about the body played a part in determining the site of physical symptoms. Women with breast cancer were found to give predominantly barrier responses on the Rorschach ( $p < .001$ ) compared to women with interior cancer (primarily cervical).

In a study of body image with 40 females, Kurtz and Hirt (1970) found that physically ill women more negatively evaluated their bodies and viewed their bodies as more passive than did a healthy group of females.

In research which judged body cathexis (defined as the degree of satisfaction with the body), Jourard and Secord (1955) concluded that women's satisfaction with their bodies varies concomitantly with the magnitude of deviation between actual and ideal size.

Their sample of 60 college females had an ideal image--which was remarkably consistent across subjects--small size for height, weight, waist, and hips and large size for bust. Since none of the women sampled matched their ideal in all dimensions, there was overall personal dissatisfaction with their body images. It is not difficult to imagine that the mastectomy patient could react with even more dissatisfaction. Jourard and Secord concluded that because women's status and security were often linked to their perceived attractiveness to men, women felt less secure and had lower self-esteem when they did not perceive themselves as "beautiful." Apparently contradictory results were found by Long (1975). Her post-mastectomy subjects increased in their self-esteem as measured by the Tennessee Self-Concept Scale two weeks post-operative as compared with pre-operative scores. This may be explained by the frequently observed denial which mastectomy patients exhibit. Schilder (1950) described the "phantom" phenomenon after amputation as an emotional attempt to maintain the integrity of the body, an example of denial used to protect self-esteem.

Fisher (1973) found that the amount of attention a woman spent on her body (grooming, wearing perfumes, makeup and jewelry) correlated positively ( $r = .30$  to  $.41$ ) with frequency of intercourse. He further reported that women more clearly than men saw a link between their bodies and primary life roles (wife and mother). Woman's body was one of the "prime means to become what she wants to become" (p. 392). Thus, if that body became observably sexually mutilated, disruptions in both self-image and potential would be likely.

### Reactions to Erotic Stimuli

Much current research has been conducted to ascertain whether females became sexually aroused when exposed to various types of erotic materials and whether there were differences between males and females in their responsivity to such stimuli. Research asked three questions: (a) Are females aroused by sexually explicit materials (stories, audiotapes, pictures, films)? (b) Is female sexuality more dependent on affection than male sexuality? and (c) Does sexual responsiveness to erotic stimuli parallel erotic responsiveness to in vivo sexual activities?

Until the 1970s, self-reports of sexual arousal were used exclusively. With such reports there was, of course, much possibility of response bias: would the subject react to the demand characteristics of the experiment and report higher or even lower arousal than was actually experienced? Mosher and Greenberg (1969) found in a study of college women and their reactions to reading erotic prose that such women did respond to erotic stimuli in a laboratory setting. In the 1970s, Schmidt (1975) and Schmidt, Sigusch, and Schafer (1973) began to ask questions regarding physiological changes that the subject noticed as the experiment progressed (erection, vaginal lubrication, breast sensations); these too were not validated by any instrumentation other than self-report. Only in 1975, with the advent of the vaginal photoplethysmograph (Sintchak & Geer), was there available a reliable physiological measure of female vaginal vasocongestion. This measure of vaginal blood volume and vaginal pressure pulse has been used along with various self-reports in the last six



years of sex research on females. The development of such a measure was encouraged by Zuckerman's (1971) research which concluded that the most valid measure of sexual arousal was the direct monitoring of genital reactions as opposed to galvanic skin response (GSR), heart rate, blood pressure, or blood volume. Hoon, Wincze, and Hoon (1976) concluded that measures of vaginal vasocongestion were the best techniques for assessing sexual arousal in women and differentiating it from other types of emotional arousal.

The data from Kinsey et al. (1953) on female sexuality strongly suggested that females were for the most part unaffected or unaroused by erotic stimuli with a few exceptions (erotic literary material, for one). Although 5,699 women were sampled, all the data were retrospective and it may be assumed that in the 1940s women had less exposure to erotica than today. Thus, their lack of professed arousal to such material might simply have reflected their lack of exposure to it (Sigusch, Schmidt, Reinfeld, & Wiedemann-Sutor, 1970) or as Gebhard (1973) pointed out, the phraseology used in the Kinsey et al. (1953) interviews was less applicable to females than to males. Jakobovits (1965) exposed women to both hard-core and "erotic realism" stories (hard-core was differentiated from "erotic realism" by a greater number of sexual terms, more exaggeration, and fewer anti-erotic elements). He found that women were more aroused by the hard-core stories. Support was provided for the conclusion that affection and romance are not necessary preconditions for women to react sexually (Athanasίου & Shaver, 1971; Fisher & Byrne, 1978; Heiman, 1977; Osborn & Pollack, 1977; Schmidt & Sigusch, 1970; Schmidt, Sigusch,

& Schafer, 1973). It appeared that the explicitness of the erotic materials rather than the presence or absence of romance affected the level of sexual arousal in women. Heiman (1977) also determined that women's sexual arousal was higher in response to audiotapes in which a woman initiated and was the focus of sexual activity.

In differentiating between sexually functional and dysfunctional women, Wincze, Hoon, and Hoon (1976) found that although both groups were aroused by erotic films, the dysfunctional group was only slightly aroused. Other than this study and the Patricia Morokoff and Julia Heiman (1980) study on women with complaints of low sexual arousal, the research to date has focused on college students and sexually functional adults in their 20's. There is a need to research older populations, as well as those with potential or existing barriers to sexual functioning.

In the issue of whether exposure to erotica increased sexual behavior, there was little conclusive evidence. Much interest in this topic occurred in the early 1970s; this was prompted by the Commission on Obscenity and Pornography (1971). Basically, in the first 24 hours after being exposed to erotic stories, German college students expressed a slight to moderate activation of sexual behavior, fantasy, and drive, with females reporting more coitus ( $p < .01$ ) and sexual drive ( $p < .001$ ) than males (Schmidt et al., 1973). In response to erotic film exposure, both sexes showed a moderate increase in emotional lability, orgasms, and masturbation in the 24 hours post-experiment (Schmidt & Sigusch, 1970). The erotic themes from the experiment did not tend to be incorporated into the subsequent

masturbation or coital fantasies of the subjects. Mosher (1973) replicated the Schmidt and Sigusch (1970) study using U.S. college students; he found that 80% of the males and 85% of the females reported genital sensations while observing erotic films. Erotic film exposure seemed to lead to increased sexual behavior in the first 24 hours post-experiment only for people with well-established sexual patterns (Mosher, 1973). Amoroso, Brown, Pruesse, Ware, and Pilkey (1970) investigated the sexual activities of subjects for seven days prior and seven days post-experiment, thus extending the period of observation but risking problems with memory. There was no significant increase in sexual activity post-experiment. These results strongly support a concept that the effects of exposure to erotica are essentially benign. Subjects simply did not report any measured change in their sex lives.

Does exposure to sexually explicit material result in increased sex guilt? Mosher (1961, 1966, 1968) devised a self-report inventory for assessing three types of guilt: sex guilt, hostile guilt, and morality-conscience guilt. Those women who were initially scored as high in sex guilt reported higher sexual guilt after exposure to erotic literature, whereas low-sex-guilt women reported a decrease in sex guilt. Both groups reported increased sexual arousal (Mosher & Greenberg, 1969). Ray and Walker (1973) found differing results when exposing high- and low-sex-guilt women to erotic slides of dating, petting, coitus, and female masturbation. They found a decrease (nonsignificant) in the state of sex guilt by both groups of women after viewing the slides. However, high-sex-guilt women rated

the explicit stimuli (all but the dating slides) as more dangerous, unpleasant, and disgusting than did the low-sex-guilt group. Ray and Walker explained the discrepancy as due to age differences between subject groups. Their group consisted of college seniors, whereas Mosher and Greenberg studied college sophomores who might have been more uncomfortable with and inexperienced with erotic stimuli.

Consequences of exposure to erotic materials appear to be mild and transitory. Mosher (1973) concluded that the researcher feels more anxiety than do subjects! His films resulted in moderate sexual arousal in both male and female subjects and mild affective changes, but there were no increases in sexual activity or changes in attitudes about sex as a function of participation in the experiment.

The above suggests strongly that exposure to erotic films will result in sexual arousal for most females and that there will be little, if any, untoward effects from this exposure. The main question remains as to the relationship between arousal to erotica in a laboratory setting and arousal to in vivo sexual activities.

#### Physiological Measures of Sexual Arousal

Physiological measures of female sexual responses have lagged considerably behind those of the male. Ohlmeyer, Brilmayer, and Hullstrung (1944), as reported by Hoon (1979), were the first to publish a report of measurement of erection, whereas measurement of vaginal capillary engorgement did not appear until 1967 (Palti & Bercovici). In 1970, new devices were developed to measure penile tumescence; typically these involved use of a mercury strain gauge

which was placed at the base of the penis. As tumescence occurred, diameter changes of the penis were measured and it became possible to quantify a man's percentage of full erection. A summary of the devices for measuring penile tumescence appear in Abel and Blanchard (1976).

In 1966, Masters and Johnson described physiological changes in females during sexual arousal; specifically, vaginal vasocongestion was the first physiological change to occur in female arousal. In 1971, in a review of physiological measures, Zuckerman did not find an accurate, objective measure of female sexual arousal. Blood pressure was the best nonspecific measure of sexual arousal in females, but this was reactive also to changes in muscular activity and stress. He stated that a direct measure of genital response was needed. Zuckerman failed to cite the study employing the vaginal photoplethysmograph reported by Palti and Bercovici (1967) probably because they used it to measure vaginal engorgement during the menstrual cycle rather than as a measure of sexual arousal. In 1975, Sintchak and Geer reported the development of the vaginal photoplethysmograph. The plethysmograph has been assessed to be a more valid and reliable physiological measure of sexual arousal than vaginal pH, temperature, finger pulse amplitude, clitoral strain gauges, heart rate, or GSR. Also it was easily inserted by the subject, produced no discomfort in place, and was readily sterilized, thus satisfying the criteria for the protection of the subject's welfare and privacy (Geer, 1975).

Four other types of instruments have been devised to date for direct genital measurement of female sexual arousal. Two of these

were reported only in abstract form. Cohen and Shapiro (1970) and Shapiro, Cohen, DiBianco, and Rosen (1972) reported using a device which measured isothermal relative vaginal blood flow. This had not been used widely because of complexities in properly fitting the subject with the device (Geer, 1975). Karacan, Rosenbloom, and Williams (1970) reported the use of clitoral strain gauges on two females with congenitally enlarged clitorises. Of course, this had not been widely used due to the engineering problems involved in designing such devices for women with normal clitorises.

Recently, temperature clips to measure changes in the labia minora have been used as measures of sexual arousal. Ten women were exposed to an erotic videotape and a nonerotic film; nine experienced increases in labial temperature without concurrent changes in the reference upper chest temperature (Henson, Rubin, Henson, & Williams, 1977). Self-reports of sexual arousal were positively correlated ( $r = .53$ ) with increased labial temperature. Dysphoric films were not included in this experiment, so it is unknown whether labial clips would register temperature changes to anxiety stimuli.

Thermography, a technique used to photograph infrared heat generation which objects emit as a function of temperature, has been employed recently to measure sexual arousal during masturbation in one male and one female subject (Seeley, Abramson, Perry, Rothblatt, & Seeley, 1980). This technique was considered by the researchers to be a "relatively unobtrusive and nonreactive" measure for detection of genital vasocongestion. However, since the subjects needed to be nude during the experiment, there is question of its widespread

acceptance and use as an unobtrusive physiological measure of sexual arousal.

Sintchak and Geer (1975) revised the photoplethysmograph. Based on light reflectance, it measured two indices of vaginal vasocongestion: vaginal blood volume and vaginal pressure pulse. A photocell and light source were enclosed in a tampon-like acrylic cylinder (1-3/4" x 1/2") which was placed in the vagina. A beam of light was directed toward the vaginal walls and was reflected back to the light detector. Changes in vasocongestion resulted in changes of reflected light. Such changes occurred with each pulse wave. Thus, variations in the opacity of the vaginal walls were measured. As reported by Hoon (1979), fluctuations in heartbeat and blood volume in the vaginal tissues corresponded to the AC and DC components which passed through the photocell. These current changes were amplified and displayed on a physiograph. Problems with this device included hysteresis, movement artifacts, and light history effects.

New modifications including the use of a light-emitting diode (LED) and a phototransistor light detector have decreased artifacts (Hoon, Wincze, & Hoon, 1976; Weinman, 1967). Sarrel, Foddy, and McKinnon (1977) described a portable cassette recorder which could record EEG, ECG, and vaginal AC signals; this could be used at home and in complete privacy. Gillan (1976) described a plethysmograph with four photocells that measured differential engorgement in different locations within the vagina.

Positive qualities of the vaginal photoplethysmograph include its rapid responsivity to erotic arousal; changes occurred within

5 to 30 seconds after an erotic stimulus (Hoon, 1979; Masters & Johnson, 1966). Also the plethysmograph was comfortable for the subject. The major drawback was movement artifact. This was not critical in the present research because subjects were comfortably seated and were instructed to move as little as possible.

Individual differences in basal vaginal opacity have been found to occur as a result of the amount of estrogen present, the day in the menstrual cycle, and the parity vs. nulliparity of the subject. Vaginal pressure pulse was found to increase sharply in ovulating women between the 10th and 14th days of the menstrual cycle ( $p < .001$ ) and again on the 20th or 21st day ( $p < .05$ ) (Palti & Bercovici, 1967). These researchers also found that women who had few menstrual periods (oligomenorrhea), no menstrual periods (amenorrhea), or were menopausal tended to have small vaginal pressure pulse measures because of the atrophic condition of the vaginal mucosa. Because of age, hysterectomy, and/or chemotherapy, women in this research tended to have few or no menstrual periods; therefore, relatively small vaginal pressure pulse fluctuations were expected.

### Similar Studies

Research on female sexual arousal to erotic films employing both physiological and phenomenological measures has occurred primarily in the past five years. Overwhelmingly, research has shown that women respond with genital arousal to erotic films and videotapes (Abramson et al., 1975; Cerny, 1978; Geer, Morokoff, & Greenwood, 1974; Henson et al., 1977; Hoon, Wincze, & Hoon, 1976, 1977; Morokoff & Heiman,



1980; Wincze, Hoon, & Hoon, 1976). Self-reports by female subjects of sexual arousal to erotic films have been reported by the above researchers plus Mosher (1973), Mosher and Abramson (1977), Schmidt (1975), and Schmidt and Sigusch (1970). Uncertainty remains as to whether self-reports and physiological measures of vaginal vasocongestion are related; only Heiman (1977), Henson et al. (1977), and Wincze et al. (1977) reported positive correlations. Lack of significant correlation was reported by Cerny (1978), Geer et al. (1974), Morokoff and Heiman (1980), Wilson and Lawson (1976), and Wincze et al. (1976). It may be that each measure provided a different piece of information about arousal rather than each being a validity check for the other (Amoroso & Brown, 1973). In either case, both measures seem important and further research is necessary to determine the relationship between them and whether correlations between physiological and phenomenological measures can differentiate sexually functional from dysfunctional women.

Women experiencing low sexual arousal and requesting sex therapy subjectively reported less sexual arousal to erotic stimuli than did a group of matched (age and years married) sexually functional controls (Morokoff & Heiman, 1980) though both groups had equivalent increases in vaginal pressure pulse. Wincze et al. (1976) reported an opposite finding: sexually functional and dysfunctional women all rated themselves as moderately aroused, but functional women showed greater vaginal vasocongestion. The researchers concluded that "women who are more aware of physiological changes during sexual activity, who rate erotic experiences as more arousing, and who engage

in intercourse more often become more physiologically aroused during erotic stimulation" (p. 451). Vaginal blood flow was positively correlated with present frequency of coitus ( $r = .62$ ), awareness of physiological changes ( $r = .41$ ), and scores on the Sexual Arousability Inventory ( $r = .75$ ). These were all significant at the  $p < .01$  level. This same group of dysfunctional women were measured after sex therapy; none of the behavioral, self-report, or physiological measures of sexual arousal showed changes post-therapy (Wincze et al., 1978) despite the fact that all the women expressed an increased capacity for sexual arousal and improvement in their sexual relationships. Again there is the question about the relationship between laboratory measures of arousal and in vivo sexual responsivity.

Much sex research has employed college and graduate students, thus providing normative data on a very small portion of the female population. Further, most subjects have been single. Only Henson et al. (1977) and Morokoff and Heiman (1980) have extended the research population to women in their later 20's and 30's. Age and years married are important variables to control. The present research measured physiological and phenomenological sexual arousal in women in their 40's and 50's, thus broadening the range of normative data to women with presumably greater sexual experience. Also it sampled women who experienced mastectomy, thus extending research into the area of physical disability.

Certain forms of erotic stimuli evoke more sexual arousal than others. Erotic film was found to be significantly more arousing ( $p < .01$ ) than the pooled effects of fantasy and audiotape (Morokoff &

Heiman, 1980). They exposed their subjects to fantasy, audiotapes, and an erotic movie on heterosexual intercourse. Unfortunately, these researchers failed to counterbalance the order of presentation of stimuli, thus did not control for possible order effects or additive effects. This research used a similar film (short-range filming of the same couple making love) to take advantage of a normative baseline with which to compare subjects' responses. Heiman (1977) found that females responded with greater sexual arousal to erotic audiotapes than to romantic, romantic-erotic, or control audiotapes. Thus, the more blatantly sexual the stimulus, the greater the arousal response. Video material was found to be more stimulating than erotic slides (Hoon et al., 1976). This further supported the use of erotic films as stimuli.

Questions have been raised as to whether feedback mechanisms enhanced or diminished sexual arousal. Cerny (1978), contrary to his prediction, found that auditory biofeedback distracted women and did not enhance arousal. Subjects were able to suppress their vaginal blood volume below their baselines but were unable to voluntarily increase it above baseline. In a two-subject repeated measures design, Hoon et al. (1977) reported that visual biofeedback was not effective in increasing vaginal capillary engorgement (vaginal blood volume), but that in one subject biofeedback in combination with erotic fantasy was able to increase vaginal blood volume. This supported the notion that cognitive processes contribute to changes in arousal and provided some validation for the use of erotic fantasy in the treatment of arousal disorders. From this very limited

research sample, it appeared that neither visual nor auditory bio-feedback regarding the level of vaginal blood volume present could enhance a woman's arousal or enable her to increase her vaginal vasocongestion.

In response to questions raised by Zuckerman (1971) in his review of the literature on physiological measures of sexual arousal, researchers have attempted to differentiate sexual arousal from other types of arousal, such as fear or shock, as measured by the photoplethysmograph and to determine what effects anxiety arousal has on sexual arousal. Hoon et al. (1977) exposed seven female volunteers to an erotic videotape (heterosexual foreplay), an anxiety videotape (tragic car accidents), and a control videotape (travelogue) to assess: (a) the effects of anxiety and control pre-exposure on erotic arousal, and (b) the effects of anxiety and control stimuli in arousal due to erotic pre-exposure. They found that once women were erotically aroused, anxiety arousal inhibited sexual arousal faster than did attention to the travelogue. Contrary to their expectations, women exhibited greater arousal when the erotic videotape was shown after the anxiety tape than when it followed the travelogue. They concluded that anxiety and sexual arousal interacted in ways that depended on the context in which the subjects perceive the stimuli. Hoon et al. (1976) presented six female subjects with erotic (foreplay videotape), dysphoric (Nazi war atrocities), and control (Nova Scotia travelogue) stimuli while measuring blood pressure, skin conductance, vaginal blood volume, finger blood pulse amplitude, and heart rate. Their results supported the use of vaginal blood volume as a physiological

index of sexual arousal; it was about eight times as sensitive to the effects of the erotic videotape than forehead temperature, and twice as sensitive as blood pressure and skin conductance.

A further question is raised as to which measure is more reactive to erotic stimuli and reflective of sexual arousal: vaginal pressure pulse or vaginal blood volume. Contradictory information prevails. Most researchers used only one measure so no comparison was possible. Hoon, Wincze, and Hoon (1976, 1977a, 1977b) and Wincze, Hoon, and Hoon (1976, 1978) measured vaginal blood volume because it was easier to use and because of historical support (Cook, 1974; Weinman, 1967). Gillan (1976), Morokoff and Heiman (1980), and Palti and Bercovici (1967) used only vaginal pressure pulse. Heiman (1976, 1977) compared vaginal pressure pulse (VPP) and blood volume (VBV) changes and found that the more rapid changes in VPP were more quickly recognized subjectively than were VBV changes. She hypothesized that because of the slow generalized response characterized by VBV changes, these changes were adapted to and became difficult to discriminate subjectively. Furthermore, she found more positive correlations between subjectively perceived arousal and VPP elevations ( $r = .44$  to  $r = .68$ ). Geer et al. (1974) found VPP more sensitive ( $p < .001$ ) in discriminating responses to erotic and nonerotic films; VBV discriminated also but at the  $p < .005$  level. Finally, Cerny (1978) found that though both VPP and VBV changed in response to erotic fantasy stimulation, VPP increased more.

### Problems in Sex Research

Despite the rapid increase in sex research in the last 15 years, relatively few studies have investigated the influence of such extraneous variables as volunteer bias, experimenter effects, the influence of the laboratory and the measuring devices, and demand characteristics of the experiment on outcomes of sex research. A review of the literature on physiological and psychological reactions to explicitly sexual stimuli reported that prior studies neither investigated the effects of personality and sex of the experimenter nor the interaction between sex of subject and sex of experimenter (Abramson, Goldberg, Mosher, Abramson, & Gottesdiener, 1975). Also no studies were included in the Technical Report on the Commission on Obscenity and Pornography, which addressed the effects of the type of setting or experimenter on outcome. Zuckerman (1971) also concluded that most sex research failed to include the effects of the experimental setting.

A couple of important contributions to this dilemma have been made recently. "Informal" experimenters have tended to establish a warm and socially permissive atmosphere. Thus, they may have increased subjects' willingness to react spontaneously and unguardedly. This in turn could enable subjects to find sexual stimuli more arousing since the potential for censure would be diminished. Female college students reacted with more affective sexual arousal to a film on heterosexual intercourse when a female experimenter acted informally (Abramson et al., 1975). Hicks (1970) showed that males were more reluctant to report socially taboo words when confronted with a businesslike experimenter or automated procedure than with a sociable experimenter.

He concluded that subjects perceived research settings as social situations and that their emotional and physiological responses reflected the perceived demands of the situation. Efforts need to be made to decrease any tendencies for subjects to respond in a socially desirable fashion. This may best be accomplished with same-sex experimenters and subjects and informal, friendly experimenter behavior. Sigusch et al. (1970) suggested that the sex differences they found between men and women in response to viewing sexual slides were due to "social desirability effect" whereby women underrated their arousal to conform to stereotypes of the sexual nature of women.

Amoroso et al. (1970) supported this view. Their subjects who were physiologically "hooked up" when viewing sexual slides perceived the slides as more pornographic and arousing than subjects who were not "hooked up." Direct genital measures were not used. It remains open to question how much of an effect the use of genital measures has on perceived and reported sexual arousal, especially because it would be difficult to obtain a comparable control group. Providing an initial rest period after insertion of the vaginal photoplethysmograph would allow initial arousal due to insertion to decrease, thus providing a more accurate baseline.

Kaats and Davis (1971) found that subjects who volunteered for sex research differed from nonvolunteers. They compared questionnaire responses regarding sexual attitudes and behavior of (a) college students who completed questionnaires during a class with (b) those who took them home to complete and with (c) those who volunteered to be

in a sex-research project. Those who volunteered were more liberal in their sexual attitudes and had more noncoital sexual experience. This was especially true for the women. No significant differences were found in the rates of premarital intercourse. Barker and Perlman (1975) failed to find significant differences in personality characteristics between sex-research volunteers and parent-child research volunteers. They used anonymous questionnaires and thus decreased the possible threat of volunteering. This likely explains the discrepancy between the studies.

Several suggestions have been made by Hoon (1979) to reduce the relative effects of laboratory participation:

1. Design research procedures with minimal performance expectations.
2. Establish rapport carefully and thoroughly explain procedures and their rationale.
3. Avoid coercion by letting subjects withdraw from participation at any time.
4. Use friendly experimenters to minimize the mechanistic aspects of the laboratory settings.

The seriousness of the study, complete freedom to withdraw, and informed consent should be stressed as well (Amoroso & Brown, 1973). Geer and Quartararo (1976) gave volunteers several chances to withdraw by scheduling three information sessions prior to the experimental session (only 7 of 60 subjects agreed ultimately to participate). They also refused financial remuneration to avoid coercion or depersonalizing connotations. Abramson (1977) stressed the importance of



debriefing post-experiment. In fact, subjects (who were asked to fill out questionnaires regarding their sex histories, who were observed choosing erotic magazines, who read an erotic story and responded to a double-entendre word-association test) reported that participation in the research was an "enjoyable learning experience" (p. 189). No subject reported invasion of privacy. Abramson concluded that the personally oriented debriefing strongly influenced the way the experiment was evaluated by the subjects.

A specific factor for women subjects in sex research is that of menstrual cycle effect on sexual responsivity. Few studies in which women were exposed to erotic stimuli controlled for this factor other than those of Luschen and Pierce (1972), MacGriffith and Walker (1975), and Wincze, Hoon, and Hoon (1976). All findings were contradictory. Luschen and Pierce (1972) found that ovulating women were more likely than premenstrual women to describe themselves as responsive to sexual stimuli. However, they included women who were taking oral contraceptives and found no differences. This confused the issue regarding the actual effects of hormone changes on sexual responsivity. Wincze et al. (1976) found that women at the end of their menstrual cycles (premenstrual) show higher levels of vaginal engorgement during sexual arousal as measured with the photoplethysmograph. These are contradictory findings. Premenstrual women subjectively reported less sexual responsivity but might have physiologically reacted with more engorgement. The effects on mood and self-perception due to premenstrual tension may account for this contradiction. MacGriffith and Walker (1975) reported no significant

differences in self-report of sexual arousal among 60 college women at different points in their menstrual cycles; they were exposed to erotic slides.

The inclusion of menopausal and nonmenstruating women in this research added data as to the effect of lack of menstruation on physiological sexual responsivity as it is measured by a photoplethysmograph.

#### Summary

This research employed (a) a specifically erotic film because films had been shown to elicit more sexual arousal than other erotic media (audiotapes, fantasies, slides, or literature) and because clearly erotic rather than romantic stimuli elicit greater sexual arousal, (b) an audiotape of a seductive nature to explore women's reactions to a more direct subject-oriented stimulus (as compared to the film in which the subjects watch a couple kiss and caress breasts and genitals), and (c) vaginal pressure pulse as the measure of vaginal vasocongestion because this measure had more consistently been shown to be reactive to erotic stimuli exposure than has vaginal blood volume. Moreover, the vaginal blood volume measure has been found to be more susceptible to light exposure and blood oxygenation level artifacts (Novelly, Perona, & Ax, 1973; Weinman, 1967). Biofeedback was not used because this was found to distract from, rather than to facilitate, sexual arousal in women (Cerny, 1978).

## CHAPTER III

### DESIGN

The purpose of this research was to determine the relationship between the experience of mastectomy and sexual arousal to erotic media in a matched group of normal women and post-mastectomy patients. The degree of correlation between two measures of sexual arousal (physiological and phenomenological) in normal (no mastectomy) and post-mastectomy women was compared to determine how closely physiological indices of arousal were linked to subjective perception of that arousal. Prior research implies that women with sexual dysfunction tend to be less aware of the physiological changes which occur during sexual arousal and thus fail to experience that arousal. This research attempted to discover the impact of the mastectomy experience on later sexual arousal and functioning. Data on pre- and post-mastectomy feelings about body attractiveness, sexual functioning, and awareness of physiological changes were obtained as indication of psychosexual adjustment and of the effect of the mastectomy on sexual arousal.

#### Subjects

Twenty women who have been married at least once and who reside on the island of Oahu, Hawaii, were recruited through physicians, local newspapers, the American Cancer Society, and personal contacts.

One group ( $n = 10$ ) was labeled the Mastectomy group and consisted of women who had experienced the surgical removal of one or both breasts. Recruitment included women who had recently had a mastectomy ( $2\frac{1}{2}$  or fewer years ago) and those who had had a mastectomy  $3\frac{1}{2}$  or more years ago. In order to avoid the possible confounding effect of initial reactive depression, the research did not recruit women who had had a mastectomy within nine months of research participation. A second group ( $n = 10$ ) was the Control group; this was comprised of women recruited from the community (also from newspapers and personal contacts). They were comparable as a group on age, race, and years married to the Mastectomy group.

Since amount of sexual experience is related to sexual responsiveness to erotica (Griffitt, 1975), control for prior sexual experience (gauged by years married) was important in matching. "In general, those subjects with the greatest degree of sexual experience were most sexually responsive to explicit depictions of sexual activities" (Griffitt, 1975, p. 538). Women in both groups were in the 34-57 year age range in which there is relatively high incidence of mastectomy.

All subjects were volunteers; each was paid \$20 for participation. Telephone interviews with volunteers in which the experimental procedure was explained and appointments scheduled were conducted by the experimenter. It was made clear that participation was voluntary and that withdrawal from the experiment was permissible without penalty at any time. The fact that this research included an explicitly sexual film was explained so that from the outset volunteers knew to

what they were consenting. The experimenter conducted the experimental procedure so that each subject had contact with only one person throughout.

### Instrumentation

#### Experimental Stimuli

In counterbalanced order, each subject was presented with an erotic film and two seductive audiotapes. Subjects were shown the stimuli in either of the following two orders: (a) Tape I, Tape II, Film or (b) Film, Tape I, Tape II. Half the subjects were presented with order A, the other half with order B. The erotic stimulus was a seven-minute segment of the film Close Up produced by Edcoa Films (New York). It was in color, had the kissing and caressing sounds of the couple as soundtrack, and depicted a young heterosexual couple engaging in kissing and foreplay. The close-up view reduced any possible negative reaction to the youthfulness of the couple. Initial normative data were available (Morokoff, 1981) and for a similar film which features the same couple engaging in intercourse; this was used by Morokoff and Heiman (1980) in their research. The seductive stimuli consisted of two brief audiotapes of a man verbally making seductive comments to the listener. One tape was more blatantly seductive than the other. These tapes were developed originally as films and used as part of a counselor training program (Interpersonal Process Recall) by Norman Kagan (1971). See Appendix G for a transcript of the audiotapes.

### Physiological Measures

Vaginal pressure pulse (VPP) and heart rate (HR) were measured with the vaginal photoplethysmograph developed by Sintchak and Geer (1975). The model used in this research was manufactured as a Physiological Recorder by Farrell Instruments, Inc. (Grand Island, Nebraska). The photoplethysmograph measures vaginal vasocongestion by recording variations in the opacity of the vaginal walls. Light is directed toward the walls of the vagina and is reflected back to the light detector; changes in vasocongestion result in changes of reflected light. Masters and Johnson (1966) determined that vaginal vasocongestion is an initial physiological indicator of female sexual arousal; vasocongestion typically begins within 5-20 seconds after effective psychological or physical sexual stimulation.

The photocell and light source of the plethysmograph are enclosed in a tampon-like acrylic cylinder. Either AC or DC signals may be recorded and amplified on the physiograph. The AC signal was selected in this research because of its greater within-session reliability (Heiman, 1976, 1977) and because the DC signal is more susceptible to light-exposure artifacts (Novelly et al., 1973). The AC signal results from vaginal pressure pulse changes; this reflects the distensibility of the vaginal capillary bed in response to changes in blood pressure that result from the heart forcing blood into the arterial system (Geer et al., 1974). They found that the VPP data for all subjects when exposed to an erotic film showed visibly detectable increases in amplitude (p. 563).

The average of ten data points of millimeter pen deflections from baseline was determined for each subject for each stimulus and for each inter-stimulus interval. Additionally, for each stimulus, two periods of maximum arousal were chosen; the VPP amplitudes of each peak were added and divided by the number of peaks per interval to determine the Maximum Arousal mean. Maximum arousal was defined as the average of the two 15-second intervals per stimulus with the largest millimeter pen deflections from baseline. Heart rate was scored from the VPP record by counting beats per unit of time during the intervals of maximum arousal response.

Inter-rater reliability was calculated by comparing the scores of a random sample of half the records made by two independent scorers.

### Subjective Measures

Subjective measures of arousal were obtained by having each subject rate her degrees of arousal and anxiety on five-point Likert-type scales immediately after the offset of each stimulus.

Scale:

| 0             | 1           | 2                       | 3     | 4         |
|---------------|-------------|-------------------------|-------|-----------|
| Not at<br>all | A<br>little | A<br>moderate<br>amount | A lot | Extremely |

1. I liked this film.
2. I felt tense during this film.
3. I felt sexually aroused during this film.
4. I felt offended during this film.
5. I felt embarrassed during this film.
6. I felt interested during this film.

The above items were chosen because they have been found to be more positively correlated to vaginal pressure pulse changes than other labels such as romantic, disgusted, or guilty (Heiman, 1975, 1976). Further, this provided replication of part of the Morokoff and Heiman (1980) study.

### Personal Data

The Sexual Arousability Inventory (SAI) (Hoon, Hoon, & Wincze, 1976) consists of 28 erotic experiences which the subject rates according to how sexually aroused she felt when she had the experience, or thinks she would feel if she actually experienced it. Ratings are on a seven-point Likert-type scale from "adversely affects arousal" to "extremely arousing/always causes sexual arousal." Multiple correlation was used in the development of this instrument to select the items from an original 131-item pool based on four sexual experience validity criteria: (a) satisfaction with the general adequacy of sexual responsivity, (b) awareness of various physiological changes during sexual arousal, and (c) reported coital frequency before and (d) during marriage (Hoon, 1979). The factors were logically consistent with the Bentler Heterosexual Experience Scale (1968) and significant correlation ( $r = .42$ ) was found in the cross-validation sample between total SAI score and the Bentler scale. In a comparison of sexually functional versus dysfunctional women, SAI discriminated between the groups ( $t$ -test;  $p < .001$ ) (Hoon, Hoon, & Wincze, 1976). This was not replicated in another sample of women with low sexual arousal and infrequent or no orgasm when they were compared to



sexually functional controls (Wincze, Hoon, & Hoon, 1976). Small samples ( $n = 15$ ,  $n = 6$ ) were used for both dysfunctional groups.

This instrument has high internal consistency (Spearman-Brown:  $r = .92$ ) and test-retest reliability ( $r = .69$ ). It can be completed rapidly (in less than five minutes) and is quickly hand scorable. Additionally, it uses the term "loved one"; thus, it is useful for single, married, and lesbian women.

A modified version of the Body-Cathexis Questionnaire (Jourard & Secord, 1955) was used to assess satisfaction with body parts and overall appearance. Twelve body areas were rated on a seven-point Likert-type scale from strong negative to strong positive feelings:

- 3 strong negative feelings
- 2 negative feelings
- 1 slight negative feelings
- 0 no feeling one way or the other
- 1 slight positive feelings
- 2 positive feelings
- 3 strong positive feelings

Body parts rated included height, weight, face, breasts, waist, hips, stomach, thighs, calves, ankles, feet, and total body appearance. Face, stomach, and total body appearance were added by the researcher, while nose length, neck length, and shoulder width were deleted from the original Body-Cathexis Questionnaire. The word "breasts" was substituted for "bust."

The Awareness of Physiological Changes (SPC) measure (Wincze et al., 1976) is a list of physical changes that frequently occur in females during sexual arousal: vaginal lubrication, nipple erection, sex flush, heart rate increase, breast swelling, muscular tension, pelvic warmth, hyperventilation (relabeled rapid breathing), and

decreasing awareness of the environment. These are scored on a five-point Likert-type scale.

|       |        |                        |                     |        |
|-------|--------|------------------------|---------------------|--------|
| 0     | 1      | 2                      | 3                   | 4      |
| Never | Rarely | About half<br>the time | Most of<br>the time | Always |

Clinical (sexual dysfunction) subjects were found to have significantly lower APC scores than did controls (sexually functional women); this plus one other out of nine self-report measures differentiated the two groups (Wincze, Hoon, & Hoon, 1976).

The Personal Interview Questionnaire was developed by the experimenter. It consists of demographic information, past and current health status, satisfaction with sex life both currently and in the past, and self-description. See Appendix B.

A brief Self-Concept Scale devised by Polivy (1977) from items used in the Body Image Scale (Berscheid, Walster, & Bohrnstedt, 1972) was used to measure general feelings about self, assertiveness, impressions of degree of competency, and self-consciousness. This scale was originally used in a Psychology Today population survey in 1972 to measure body image, social interaction, and self-concept. See Appendix D for a copy of the items used in this research.

### Procedure

For both the Mastectomy group and the Control group, the procedures were identical. Each subject reported one at a time to the laboratory, which was an office within the University Counseling Center. The subject was greeted by the experimenter, the experimental procedure was explained, the Informed Consent was explained and given to the

subject to be read and signed in duplicate, and the first half of the Personal Interview Questionnaire, Body Cathexis Measure, and the Self-Concept Scale were completed. The experiment was described as follows:

This is a research project designed to study women's emotional and physical reactions to different films and tape recordings. The film concerns sexuality. After you observe, you will fill out short forms about your emotional reactions.

The subject then was instructed on the placement of the vaginal photoplethysmograph. She was instructed to insert the device into her vagina so that there was one inch between the end of the device and the vaginal opening. A picture of a vagina with a correctly placed plethysmograph was available. The subject was given her subjective response forms. At this point the experimenter left the room so that the subject could insert the plethysmograph in privacy. She remained clothed and sat in a comfortable chair in front of the film projector. She was instructed to sit quietly and not to move much. Communication occurred through a closed door between the subject and the experimenter, thus allowing maximal privacy.

A baseline of resting vaginal pressure pulse and heart rate was taken. The erotic film and the two seductive audiotapes were presented in counterbalanced order. After each stimulus, the subject filled out her subjective response forms. One to three minutes elapsed between stimulus presentations to allow vaginal pressure pulse readings to return to a baseline level. A recording of the inter-stimulus intervals was taken as an additional baseline.

After the stimulus presentations, the subject removed the vaginal device. It was washed with soapy water and then soaked and sterilized

in a Cidex disinfectant solution for 30 minutes. This had been shown to effectively sterilize the instrument without creating adverse side effects for the next user (such as vaginal contamination or infection). The plethysmograph and most of its cord was washed in water after the Cidex soaking. There was an obstetrician-gynecologist physician consultant for this research in case of any untoward effects from the use of the vaginal photoplethysmograph.

At the conclusion of the stimulus presentation, the subject filled out the Sexual Arousability Inventory, the Awareness of Physiological Changes measure, and completed the Personal Interview Questionnaire. These sexually oriented questionnaires were included after the audiotape and film presentation to avoid creating unusual attention to physiological responses. The subject was debriefed by the experimenter at the completion of this as to the nature of the study. Questions were answered, and she was offered access to the final results of the research. The experimenter's phone number was given in the event that the subject had any further concerns or in the unlikely event of physical or psychological reactions post-experiment. She was paid \$20 for her participation.

#### Experimental Design

The following hypotheses were tested:

1. There would be greater physiological reactivity for all subjects as measured by increases in vaginal pressure pulse to the erotic film than to the mildly seductive audiotape, (b) greater VPP reactivity to the medium seductive audiotape than to the mildly seductive audiotape, and (c) the VPP

reactivity to the erotic film will be different than to the seductive audiotapes.

- H<sub>1</sub>: (a)  $VPP_{\text{erotic}} > VPP_{\text{mildly seductive audiotape}}$   
 (b)  $VPP_{\text{medium seductive tape}} > VPP_{\text{mildly seductive tape}}$   
 (c)  $VPP_{\text{erotic film}} \neq VPP_{\text{seductive audiotapes}}$

A three-way ANOVA with repeated measures (treatment group x order x levels of eroticism) was used to test this hypothesis. Duncan's Multiple Range Test was used for post-hoc analysis.

2. There would be greater perceived sexual arousal for all subjects as measured by self-reports (using the combined reactions of sexually aroused, liked, and interested) to the erotic film than to the mildly seductive audiotape,  
 (b) greater perceived sexual arousal to the medium seductive audiotape than to the mildly seductive audiotape, and  
 (c) sexual arousal to the erotic film would be different than to the seductive audiotapes.

- H<sub>2</sub>: (a)  $SSA_{\text{erotic film}} > SSA_{\text{mildly seductive audiotape}}$   
 (b)  $SSA_{\text{medium seductive tape}} > SSA_{\text{mildly seductive tape}}$   
 (c)  $SSA_{\text{erotic film}} \neq SSA_{\text{seductive audiotapes}}$

A three-way ANOVA with repeated measures (treatment group x order x levels of eroticism) was used to test this hypothesis.

3. Heart rate will differ during the various stimulus presentations.

- H<sub>3</sub>:  $HR_{\text{erotic film}} \neq HR_{\text{mildly seductive}} \neq HR_{\text{medium seductive tape}}$

HR = mean heart rate for both groups combined for each stimulus during periods of maximum arousal

A one-way ANOVA (levels of eroticism) was used to test Hypothesis 3.

4. Women who have experienced a mastectomy would have a poorer body image as measured by the modified Body Cathexis scale than would nonmastectomized women.

$$H_4: M_1 < M_2$$

$M_1$  = mean score on Body Cathexis scale of mastectomized women

$M_2$  = mean score on Body Cathexis scale of nonmastectomized women

A one-tailed t-test was used to test this hypothesis.

5. Nonmastectomized women will have a stronger positive correlation between vaginal pressure pulse changes (using VPP mean and VPP of maximum arousal) and perceived sexual arousal than will mastectomized women in response to the erotic film.

VPP mean and VPP max were used to maximize the amount of information about vaginal pulse responsivity to the stimuli. Prior research used one or the other measure but never both.

$$H_5: r_{Cx} > r_{Mx}$$

$$r_{Cmax} > r_{Mmax}$$

$r_{Cx}$  = correlation between VPP means and perceived sexual arousal for controls (nonmastectomized women)

$r_{Mx}$  = correlation between VPP mean arousal and perceived sexual arousal for mastectomized women

$r_{Cmax}$  = correlation between VPP maximum arousal and perceived sexual arousal for nonmastectomized women

$r_{Mmax}$  = correlation between VPP maximum arousal and perceived sexual arousal for mastectomized women

Pearson product-moment correlations were used to test this hypothesis.

6. Women who have not had mastectomies will score higher on the Sexual Arousalability Inventory, thus indicating greater sexual responsivity, than those who have had mastectomies.

$$H_6: SAI_{\text{control}} > SAI_{\text{mastectomy}}$$

A one-tailed t-test was used to test Hypothesis 6.

7. There will be a difference in mean scores on the Awareness of Physiological Changes inventory between the control and the mastectomy groups.

$$H_7: APC_c \neq APC_m$$

$APC_c$  = mean score on Awareness of Physiological Changes for nonmastectomized women

$APC_m$  = mean score on Awareness of Physiological Changes for mastectomized women

A two-tailed t-test was used to test Hypothesis 7.

8. An increase in the time post-mastectomy will increase the positive correlation between vaginal pressure pulse changes and perceived sexual arousal to the erotic film.

$$H_8: r_{om} > r_{nm}$$

$r_{om}$  = correlation between VPP changes and SSA (subjective sexual arousal) for women who had the mastectomy 2½ or fewer years ago

$r_{nm}$  = correlation between VPP changes and SSA (subjective sexual arousal) for women who had the mastectomy 3½ or more years ago

Pearson product-moment correlations were used to test this hypothesis.

The significance level for all hypothesis testing was set at

$$\alpha < .05.$$

### Statistical Analysis

Three-way analyses of variance (treatment group x eroticism x order) were used to test Hypotheses 1 and 2. A one-way ANOVA was used for Hypothesis 3. T-tests were used for analysis of Hypotheses 4, 6 (one-tailed) and 7 (two-tailed). Pearson product-moment correlations were computed to test Hypotheses 5 and 8. Scheffé, Duncan's Multiple Range, and Newman-Keuls post-hoc analyses were done to test ANOVA significance. Level of significance was set at  $\alpha = .05$ .

### Safeguards for Subjects' Protection

Protection of human subjects' rights during research participation is vital ethically in order to maintain good faith regarding science and the value of research and to prevent any deleterious effects to research participants. Because this project dealt with the sensitive topic of sexuality and used direct genital measures, there was a special need to protect subjects' rights (Bohlen, 1980).

### Confidentiality

Each subject was informed that the data collected from her participation were coded by number so as to maintain confidentiality and anonymity. No names or identifying information other than age, years married, and relevant descriptive information regarding her sexual history and attitudes toward mastectomy are used in the final research report. All attempts to disguise her actual identity are taken when the descriptive sexual and/or mastectomy information is used.

Further safeguards to privacy included viewing the stimulus films in private, remaining fully clothed, and inserting and removing the



vaginal photoplethysmograph in private. Moreover, her presence at the site of the experiment did not directly link her with this study since it is a general counseling and testing center and because data collection occurred only on weekends.

### Consent

The subject was informed about the general nature of the research (i.e., females' attitudes and emotions about sexuality and their reactions to filmed stimuli), the use of a genital measurement device (the vaginal photoplethysmograph), the fact that a sexual film would be viewed, and that sharing of personal information was necessary. She was encouraged to ask questions about her participation. An Informed Consent form was read and signed (see Appendix A). She was told that she could discontinue participation at any time without recrimination and that the investigator could either discontinue her participation or choose not to use her data (for example, if there were recording difficulties or major interruptions in the experimental procedure).

### Risks/Benefits

Achieving an appropriate balance between experimental risks and benefits is considered one of the vital issues in protecting the rights of subjects in research (Barber, Lally, Makarushka, & Sullivan, 1973). In this research project the following risks and safeguards were included.

1. A battery-operated vaginal photoplethysmograph was used to prevent any possibility of electrical shock to the subject.

2. The vaginal probe and connecting wire were sterilized for 30 minutes in a Cidex solution after each use to preclude any cross-infection between subjects. After sterilization, the probe and wire were rinsed in warm water to remove the Cidex solution. This prevented possible allergic reaction or vaginal irritation due to the Cidex solution.

3. No subject was included who had an active vaginal infection or venereal disease, to preclude cross-infection.

4. No subject was included who was pregnant. The effects during pregnancy of the use of a vaginal probe have not yet been demonstrated.

5. The experimenter was available for psychological consultation in the unlikely event that the subject reacted adversely to her participation in the research.

6. An obstetrician-gynecologist was used in the event of unfavorable gynecological effects due to participation.

Benefits are less easy to document. However, the experimenter believes that the following were potential benefits for the research participant.

1. The subject would likely increase her understanding of her own sexual responsivity by focusing her attention on physiological changes that occur during sexual excitement (Wincze, Hoon, & Hoon, 1976) and by evaluating her degree of sexual arousal.

2. She would have a better understanding of anatomy and physiology and the interaction of physiological, cognitive, and emotional components in sexual response.

3. The subject could develop a clearer idea of how her self-image and body image affected her sexual arousal.

4. She would have an opportunity to discuss her feelings and attitudes about her sexuality and mastectomy; such an opportunity has been deemed important yet relatively unavailable for mastectomy patients (Johnson, 1976; Schain, 1976; Wellisch, 1980; Witkin, 1978).

5. The subject may have had the satisfaction of contributing to the advancement of scientific knowledge.

## CHAPTER IV

### RESULTS

In this chapter, demographic information about the sample is presented first. This is followed by the results of hypothesis testing and finally by additional statistical data.

#### Demographic Data

Subjects were recruited and tested on the island of Oahu, Hawaii, during a four-month period from March 1981 through June 1981. Total sample size for this research was 24; 13 subjects had experienced a mastectomy (11 of whom completed all parts of the experimental procedure), and 11 subjects constituted the control group. Physiological data were lost for three subjects (two experimental and one control) due to mechanical failure. Total data were available for 20 subjects (10 each for experimental and control groups). Pencil-and-paper measures and interview data were available for all 24 subjects. Refer to Table 1 for further demographic information.

#### Marital Status

All women had been married at least once; 17 were currently married, although two of these women were separated from their husbands. Seventy-seven percent of the mastectomy group were married and living with their first husbands; this was true for 45% of the control group.

### Age

The total group ranged in age from 34 to 57 years, with a mean age of 47. The experimental group was slightly younger on the average (range: 34-57 years; mean: 47) than the control group (range: 38-54; mean: 48).

### Race

Most subjects were Caucasian (75%); one subject each was Korean, Chinese, or Filipino. Three subjects were Japanese. This did not accurately reflect the population of Oahu as was expected (Chase, 1980) in that there was an over-representation of Caucasians and an under-representation of Japanese.

### Education

The total group was more educated than the population at large, with the experimental group having completed a greater mean number of years of formal education than the controls (experimental mean: 15.8 years; control mean: 13.7 years). All women who had mastectomies had some post-high school education; three had Ph.D.'s. In the control group, all had completed high school except one; two had post-Master's degree education.

### Reproductive Histories

Mean age of menarche was 12.4 years across the total sample (range: 10-15). Most of the women were no longer menstruating regularly (75%), usually due to the effects of chemotherapy (38%) or hysterectomy (37%). All but one woman had been pregnant at least

once, with a range of zero to eight pregnancies and a mean of 3.8 pregnancies. There was a mean of 3.25 live births for the total sample.

#### Early Developmental Loss

Three women (12.5%) experienced the death of a parent before age 18; the parents of four women (16%) divorced while the subjects were children or adolescents. Two lost siblings before age 18. There were no significant between-groups differences on either loss of parent or loss of sibling prior to age 18.

#### Sexual Responsiveness

Coital frequency ranged from none (due to no currently available or desirable sexual partner) to eight times per week, with a mean of 1.6 times per week. Satisfaction with sex life was scored on a 1 to 10 scale. The mean reported satisfaction for the total group was 5.7 (mastectomy mean: 4.5 and control mean: 6.7). Satisfaction with one's current sexual responsiveness was also scored on a 1 to 10 scale, with a total group mean of 7.0 (mastectomy mean: 7.0 and control mean: 7.1). Orgasm frequency ranged from never to almost always, with most women reporting orgasm in 50-75% of their sexual encounters. Forty-six percent reported orgasm almost always, while 12.5% had never experienced orgasm with a partner. Fifty-seven percent experienced orgasm during coitus without concurrent clitoral stimulation at least some of the time. One-third (33%) had had orgasms during dreams at some time in their lives. The groups rated their degree of satisfaction with their partner's sexual responsiveness on a 1 to 10 scale; partners received an overall 7.6; thus women described themselves as

more than averagely satisfied with their partner's sexual responsivity to them.

Overall, the two groups were very similar in age, marital status (with more controls married more than once), race, age at first menstruation, number of pregnancies and live births, intact families of origin, coital and orgasm frequencies, and satisfaction with current sexual responsiveness. Differences were noted in educational level, incidence of divorce and remarriage (greater for controls), incidence of hysterectomy (greater for controls), and minor differences in satisfaction with sex life. Thus, the two groups may be considered very comparable in terms of demographics, general health (excluding prior incidence of cancer), sexual satisfaction and responsiveness, incidence of loss in family history, and social class (middle). See Table 1.

#### Hypothesis Testing

In the following eight hypotheses, statistical significance was determined at the  $p < .05$  level. Analyses of variance, post-hoc analyses,  $t$ -tests, and Pearson product-moment correlations were used for statistical analysis of the data.

A random sample of half (ten) of the subjects' physiological data (VPP recordings) were each scored by two independent raters in order to ascertain the degree of inter-rater reliability. For audiotape I, the correlations of inter-rater reliability ranged for the ten samples from .914 ( $p < .0002$ ) to 1.00 ( $p < .0001$ ), with an overall reliability coefficient of .973 ( $p < .0001$ ). For audiotape II, these correlations

Table 1  
Demographic Data

|                       | Mastectomees | Controls | Total | $\bar{X}$ | <u>SD</u> |
|-----------------------|--------------|----------|-------|-----------|-----------|
| Sample size           | 13           | 11       | 24    |           |           |
| Marital status        |              |          |       |           |           |
| Married               | 10           | 5        | 15    |           |           |
| Widowed               | 1            | 0        | 1     |           |           |
| Separated             | 0            | 2        | 2     |           |           |
| Divorced              | 2            | 4        | 6     |           |           |
| Age                   |              |          |       |           |           |
| 34-39                 | 3            | 1        | 4     |           |           |
| 40-44                 | 1            | 0        | 1     |           |           |
| 45-49                 | 2            | 5        | 7     | 47.75     | 6.0       |
| 50-54                 | 6            | 5        | 11    |           |           |
| 55-57                 | 1            | 0        | 1     |           |           |
| Race                  |              |          |       |           |           |
| Caucasian             | 10           | 8        | 18    |           |           |
| Japanese              | 1            | 2        | 3     |           |           |
| Filipino              | 1            | 0        | 1     |           |           |
| Chinese               | 0            | 1        | 1     |           |           |
| Korean                | 1            | 0        | 1     |           |           |
| Menarche              |              |          |       |           |           |
| 10 years              | 1            | 1        | 2     |           |           |
| 11 years              | 2            | 3        | 5     |           |           |
| 12 years              | 3            | 2        | 5     |           |           |
| 13 years              | 5            | 3        | 8     | 12.41     | 1.44      |
| 14 years              | 0            | 1        | 1     |           |           |
| 15 years              | 2            | 1        | 3     |           |           |
| Number of pregnancies |              |          |       |           |           |
| None                  | 0            | 1        | 1     |           |           |
| 1                     | 1            | 1        | 2     |           |           |
| 2                     | 3            | 1        | 4     |           |           |
| 3                     | 2            | 2        | 4     |           |           |
| 4                     | 0            | 3        | 3     | 3.87      | 2.07      |
| 5                     | 4            | 0        | 4     |           |           |
| 6                     | 2            | 2        | 4     |           |           |
| 7-8                   | 1            | 1        | 2     |           |           |



Table 1  
Continued

|                          | Mastectomees | Controls | Total | $\bar{X}$ | <u>SD</u> |
|--------------------------|--------------|----------|-------|-----------|-----------|
| Early loss of parent     | 2            | 5        | 7     |           |           |
| Early loss of sibling    | 1            | 1        | 2     |           |           |
| Coital frequency         |              |          |       |           |           |
| No partner               | 2            | 3        | 5     |           |           |
| Once a month             | 1            | 2        | 3     |           |           |
| Once a week              | 4            | 1        | 5     | 1.68      | 1.76      |
| Twice a week             | 2            | 1        | 3     |           |           |
| 3 times a week           | 4            | 3        | 7     |           |           |
| 4+ times a week          | 0            | 1        | 1     |           |           |
| Orgasm frequency         |              |          |       |           |           |
| Never with a man (0)     | 0            | 3        | 3     |           |           |
| 25% of the time (1)      | 4            | 2        | 6     |           |           |
| 50% of the time (2)      | 1            | 0        | 1     | 2.54      | 1.58      |
| 75% of the time (3)      | 2            | 1        | 3     |           |           |
| Almost always (4)        | 6            | 5        | 11    |           |           |
| Hysterectomy             | 4            | 5        | 9     |           |           |
| Breast reconstruction    | 5            | N/A      | 5     |           |           |
| No breast reconstruction | 8            | N/A      | 8     |           |           |

ranged from .91 ( $p < .0002$ ) to .999 ( $p < .0001$ ), with an overall inter-rater reliability coefficient of .967 ( $p < .0001$ ). Finally, for the erotic film the correlations ranged from .927 ( $p < .0001$ ) to .998 ( $p < .0001$ ). The overall inter-rater reliability correlation for all 30 data samples (ten from each stimulus presentation) was .976 ( $p < .0001$ ). Thus, for the physiological data, there was excellent inter-rater reliability.

### Hypothesis 1

This hypothesis measured the effects of stimulus eroticism on vaginal pressure pulse (VPP). It was hypothesized that there would be: (a) greater physiological reactivity as measured by increases in vaginal pressure to the erotic film than to the mildly seductive audiotope I, (b) greater VPP reactivity to the medium seductive audiotope II than to the mildly seductive audiotope, and (c) the VPP reactivity to the erotic film would differ from the reactivity to the seductive audiotapes. Analyses of variance were performed using: (1) mean VPP during each stimulus presentation and (2) maximal VPP during each stimulus presentation. Additionally, a treatment x order x eroticism analysis of variance was used to ascertain interaction effects.

When mean VPP was used as the dependent variable in a one-way ANOVA, there were no significant differences between the levels of stimuli ( $F = 0.72$ ,  $df = 2/57$ ,  $p < .49$ ), as seen in Table 2. However, when the two treatment groups were separated and a group x level of eroticism x order analysis of variance with repeated measures (Glass &

Table 2  
Analysis of Variance: Effects of Stimulus  
Eroticism on Vaginal Pressure Pulse

| Source  | <u>df</u> | <u>MS</u> | <u>F</u> |
|---------|-----------|-----------|----------|
| Stimuli | 2         | 8.498     | 0.72     |
| Error   | 57        | 11.787    |          |

**Note:** Significance level set at  $p < .05$ . Not significant.

| <u>Stimuli</u> | <u>N</u> | <u>Means</u> |
|----------------|----------|--------------|
| Tape I         | 20       | 6.052        |
| Tape II        | 20       | 5.847        |
| Film           | 20       | 7.065        |

Stanley, 1974), there were significant effects for eroticism and interaction between eroticism and order. No significant main effects were found for treatment group. The error variance was partialled out with the addition of the third variable of order, thus explaining the difference in the two statistical tests. On post-hoc analysis with both Scheffé's and Newman-Keuls tests (Keppel, 1970), the VPP mean for the erotic film was found to be significantly different at the  $p < .05$  level from the means of the audiotapes. See Table 3.

When (2) maximal VPP during each stimulus presentation was used in a three-way ANOVA (treatment group x level of eroticism x order) with repeated measures, there was a significant main effect for eroticism ( $F = 6.47$ ,  $df = 2/32$ ,  $p < .004$ ) but no significant effects for order or treatment group. No significant interaction effects were found. See Table 4.

There was statistical support for Hypothesis 1, Parts A and C, but not for Part B.

## Hypothesis 2

This hypothesis measured the effect of stimulus eroticism on subjective sexual arousal. The construct of subjective sexual arousal was defined as the combined ratings of sexual arousal, liked, and interested as reactions to the stimuli. It was hypothesized that there would be: (a) greater subjective sexual arousal to the erotic film than to the mildly seductive audiotape I, (b) greater subjective sexual arousal to the medium seductive audiotape II than to the mildly seductive audiotape I, and (c) the subjective sexual arousal to the erotic film would differ from that to the seductive audiotapes.



Table 3

Analysis of Variance: Effects of Treatment Group x  
Eroticism x Order on Vaginal Pressure Pulse

| Source          | <u>df</u> | <u>MS</u> | <u>F</u> |
|-----------------|-----------|-----------|----------|
| Treatment group | 1         | 12.97     | 0.38     |
| Order           | 1         | 0.48      | 0.01     |
| T x O           | 1         | 3.36      | 0.10     |
| Error           | 16        | 34.54     |          |
| Eroticism       | 2         | 8.49      | 3.92**   |
| E x T           | 2         | 5.60      | 2.58     |
| E x O           | 2         | 6.81      | 3.14*    |
| E x T x O       | 2         | 4.00      | 1.85     |
| Error           | 32        | 2.16      |          |

\*Significant at the  $p < .056$  level.

\*\*Significant at the  $p < .03$  level.

|                | <u>Order A</u>              |             |                             |             | <u>Order B</u>              |             |                             |             |
|----------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|-------------|-----------------------------|-------------|
|                | <u>Controls</u>             |             | <u>Mastectomees</u>         |             | <u>Controls</u>             |             | <u>Mastectomees</u>         |             |
|                | <u><math>\bar{X}</math></u> | <u>S.D.</u> | <u><math>\bar{X}</math></u> | <u>S.D.</u> | <u><math>\bar{X}</math></u> | <u>S.D.</u> | <u><math>\bar{X}</math></u> | <u>S.D.</u> |
| T <sub>1</sub> | 5.29                        | 4.95        | 5.71                        | 3.64        | 5.84                        | 3.02        | 7.37                        | 4.09        |
| T <sub>2</sub> | 5.58                        | 4.49        | 6.32                        | 3.27        | 6.27                        | 1.40        | 5.22                        | 2.86        |
| F              | 6.26                        | 4.91        | 5.98                        | 3.17        | 9.23                        | 2.72        | 6.79                        | 3.00        |

Table 4  
 Analysis of Variance: Effects of Treatment Group x Eroticism x  
 Order on Maximum Vaginal Pressure Pulse

| Source          | <u>df</u> | <u>MS</u> | <u>F</u> |
|-----------------|-----------|-----------|----------|
| Treatment group | 1         | 20.85     | 0.31     |
| Order           | 1         | 10.02     | 0.15     |
| T x O           | 1         | 3.03      | 0.04     |
| Error           | 16        | 67.69     |          |
| Eroticism       | 2         | 38.58     | 6.47*    |
| E x T           | 2         | 0.33      | 0.06     |
| E x O           | 2         | 15.39     | 2.58     |
| E x T x O       | 2         | 0.34      | 0.06     |
| Error           | 32        | 5.96      |          |

\*Significant at the  $p < .004$  level.

A three-way analysis of variance (treatment x order x eroticism) was used in Table 5. There were significant differences for eroticism, and the hypothesis was supported ( $F = 17.82$   $df = 2/36$ ,  $p < .00001$ ). There was greater subjective sexual arousal to the erotic film ( $\bar{X} = 1.90$ ) than to either of the audiotapes (Tape I  $\bar{X} = .62$ ; Tape II  $\bar{X} = 1.24$ ). Mastectomees rated themselves as less aroused than controls but not at a significant level. A Duncan's Multiple Range test (Keppel, 1970) was used for post-hoc analysis. There was greater subjective sexual arousal for the total sample to the erotic film than to either of the audiotapes. The means of the subjective arousal for the two audiotapes were not significantly different; thus Part B of this hypothesis was not supported. This supports the notion that the stimuli elicited differential subjective reports of sexual arousal. Thus, Hypothesis 2 was supported for Parts A and C.

### Hypothesis 3

It was hypothesized that heart rate would not be equal during the three stimulus presentations. As presented in Table 6, a one-way analysis of variance was performed using three levels of stimulus presentation and the total group of the 20 subjects who completed the physiological phase of the experiment. There were no significant differences in heart rates during the stimulus presentations ( $F = .03$ ;  $df = 2/57$ ;  $p < .96$ ). The means for the three stimuli were almost equal (Tape I = 19.6; Tape II = 19.825; Film = 19.825; standard deviation = 3.199). Thus, there was no support for this hypothesis.



Table 5  
 Analysis of Variance: Effects of Treatment x Eroticism  
 x Order on Subjective Sexual Arousal

| Source    | <u>df</u> | <u>MS</u> | <u>F</u> |
|-----------|-----------|-----------|----------|
| Treatment | 1         | 3.300     | 1.76     |
| Order     | 1         | .219      | .12      |
| T x O     | 1         | .012      | .01      |
| Error     | 18        | 1.880     |          |
| Eroticism | 2         | 9.622     | 17.82*   |
| E x T     | 2         | .328      | .61      |
| E x O     | 2         | 1.121     | 2.08     |
| E x T x O | 2         | .034      | .06      |
| Error     | 36        | .540      |          |

\*Significant at the  $p < .00001$  level.

Table 6  
Analysis of Variance: Effects of Stimulus  
Eroticism on Heart Rate

| Source             | <u>df</u> | <u>MS</u> | <u>F</u> |
|--------------------|-----------|-----------|----------|
| Stimuli            | 2         | 0.337     | 0.03     |
| Error              | 57        | 10.238    |          |
| Standard deviation | 3.19      |           |          |

Not significant at the  $p < .05$  level.

| <u>Stimuli</u> | <u>N</u> | <u>Means</u> |
|----------------|----------|--------------|
| Tape I         | 20       | 19.600       |
| Tape II        | 20       | 19.825       |
| Film           | 20       | 19.825       |

#### Hypothesis 4

It was hypothesized that women who had experienced a mastectomy would have a poorer body image than women who had not had a mastectomy. Body image was measured by the Body-Cathexis Questionnaire (Jourard & Secord, 1955), which was modified by the experimenter to include face, stomach, and total body appearance. A t-test was performed on the mean scores for each group. Both groups were nearly equal, with group means of .636 for the control group and .23 for the experimental group. There was a considerable range with scores from -21 to 25 and large standard deviations (13.139 for the control group and 12.656 for the experimental). Variances were equal. The t-tests revealed no significant differences between groups; therefore, Hypothesis 4 was not supported (t = .0766, p < .939).

#### Hypothesis 5

This hypothesis predicted the relationship between subjective sexual arousal and physiological sexual arousal to the erotic film in mastectomized women and the control group. It was hypothesized that women who have not had a mastectomy would have a stronger positive correlation between their vaginal pressure pulse (VPP) changes and subjective sexual arousal to the erotic film than would women who had a mastectomy. Two measures of assessing vaginal pressure pulse were used: (a) mean VPP and (b) maximal arousal VPP. A composite measure of subjective sexual arousal (total score of sexually aroused, interested, and liked) was used.

Pearson product-moment correlations (Glass & Stanley, 1974) were used to assess the relationships between perceived sexual arousal and mean VPP in response to the erotic film for each group (see Table 7). A significant positive correlation was found for the control group ( $r = .74$ ;  $p < .01$ ) but not for the mastectomy group ( $r = .15$ ;  $p < .66$ ). Given the small sample size (10 per group), this was quite a significant correlation. Thus, Hypothesis 5, Part A, was supported.

The same was true for maximal VPP arousal and subjectively perceived sexual arousal as indicated in Table 7 (control group:  $r = .69$ ;  $p < .02$ ; experimental group:  $r = -.13$ ;  $p < .70$ ). A test for difference between these correlations resulted in significance at the  $p < .042$  level for subjective sexual arousal and maximum vaginal pressure pulse (Hays, 1973). Control women defined their physiological reactions as sexual arousal more so than did women who had mastectomies. Therefore, Part B of Hypothesis 5 was also supported.

Pearson product-moment correlations were also used to determine the relationship between (a) vaginal pressure pulse changes and the composite "sexually turned-off" variable (composite of tense, embarrassed, and offended subjective responses) and (b) maximum arousal VPP and "sexually turned-off" for all three stimulus conditions. There was no statistical significance when groups were combined. For all stimulus conditions there were negative correlations between physiological arousal and subjective reports of sexual turn-off. That is, as physiological arousal decreased, there were increases in the reporting of sexual turn-off for both vaginal pressure pulse and maximum arousal measures.

Table 7  
By-Group Correlations of Subjective and Physiological  
Measures in Response to Erotic Film

|                                | Experimental | Control |
|--------------------------------|--------------|---------|
| Subjective Sexual Arousal      |              |         |
| Vaginal pressure pulse mean    | 0.155        | 0.749** |
| Maximum vaginal pressure pulse | -0.138       | 0.696*  |
| Subjective Sexual Turn-Off     |              |         |
| Vaginal pressure pulse mean    | -0.841**     | -0.14   |
| Maximum vaginal pressure pulse | -0.687*      | 0.024   |

\*Significant at the  $p < .025$  level.

\*\*Significant at the  $p < .012$  level.

\*Significant at the  $p < .059$  level.

\*\*Significant at the  $p < .008$  level.

However, when the groups were analyzed separately, statistical differences appeared. The mastectomy group had high negative correlations between VPP and subjectively perceived sexual turn-off ( $r = -0.84$ ;  $p < .008$ ), which was significantly different ( $p < .029$ ) from the control group correlation, as well as between maximum arousal and sexual turn-off ( $r = -0.68$ ;  $p < .059$ ). This difference in between-group correlations was not significant ( $p < .093$ ). The control group did not show such strong negative correlations ( $r = -0.14$ ;  $p < .69$  for VPP and  $r = .02$ ;  $p < .94$  for maximum arousal). Thus, for mastectomized women, as there was greater physiological reactivity, there was less sexual turn-off. However, there was no greater sexual arousal as VPP and maximum arousal increased ( $r = .15$ ;  $p < .66$  for VPP;  $r = -0.13$ ;  $p < .70$ ). As mastectomized women became more physiologically aroused, they did not define this state as "sexually aroused" or "sexually turned-off." The control group, on the other hand, reported more congruence between subjective sexual arousal and physiological arousal.

#### Hypothesis 6

It was hypothesized that women who have not experienced a mastectomy would show greater sexual responsivity, as measured by the Sexual Arousal Inventory, than those who had a mastectomy. A one-tailed  $t$ -test was used. It revealed no significant differences between the groups (mastectomees:  $\bar{X} = 74.46$ ,  $SD = 27.75$ ; controls:  $\bar{X} = 79.18$ ,  $SD = 32.46$ ;  $t = 0.37$ ,  $p < .70$ ). Thus, this hypothesis

was not supported. It appears that the mastectomy experience does not affect a woman's self-perceived sexual arousability.

#### Hypothesis 7

This hypothesis stated that women who had mastectomies would differ from women who had not in their awareness of physical changes that occur during sexual arousal. This was measured by comparison of mean scores on the Awareness of Physiological Changes inventory. A one-tailed  $t$ -test was used ( $p < .92$ ). Both groups were extraordinarily similar in their mean scores on this inventory (mastectomy group mean = 23.84,  $SD = 5.11$ ; control group mean = 23.63,  $SD = 5.12$ ). This hypothesis was not supported.

#### Hypothesis 8

The hypothesis that increase in time post-mastectomy increased the positive correlation between vaginal pressure pulse changes and subjective reports of sexual arousal to the erotic film was tested. This hypothesis stated that there is increasing emotional adjustment as time passes after mastectomy and that such adjustment is reflected in more congruence between physiological sexual arousal and perception and cognitive labeling of that sexual arousal. This was tested with a Pearson product-moment correlation and was not supported ( $r = .977$ ,  $p < .13$  for recent mastectomees;  $r = .262$ ,  $p < .571$  for distant).

As time increased post-mastectomy, there also were no statistically significant correlations between increasing time since mastectomy and sexual arousability ( $r = -0.13$ ;  $p < .66$ ), subjective sexual arousal to the erotic film ( $r = -0.04$ ;  $p < .89$ ), vaginal

pressure pulse increase to the erotic film ( $r = .14$ ;  $p < .68$ ), satisfaction with current sex responsiveness ( $r = .14$ ;  $p < .62$ ), coital frequency ( $r = .15$ ;  $p < .62$ ), orgasm frequency ( $r = -0.03$ ;  $p < .90$ ), general attractiveness ( $r = .36$ ;  $p < .21$ ), sexual attractiveness compared to other same-age women ( $r = .25$ ;  $p < .41$ ), and sexual responsiveness when compared with same-age women ( $r = -0.34$ ;  $p < .24$ ). Hypothesis 8 was not supported.

### Other Statistical Data

#### Sexual Reactivity

Self-reported sexual adjustment measures were correlated to ascertain the nature of the relationship between such measures. Pearson product-moment correlations were used. As indicated in Tables and degree of self-reported satisfaction with current sex life was significantly positively correlated with satisfaction with current sexual responsiveness ( $r = .50$ ;  $p < .03$ ), coital frequency ( $r = .50$ ;  $p < .01$ ), general attractiveness compared to other same-age women ( $r = .44$ ;  $p < .02$ ), and sexual attractiveness ( $r = .46$ ;  $p < .02$ ). Satisfaction with current sex life was negatively correlated with perceived negative change in sex life in the past five years ( $r = -0.41$ ;  $p < .04$ ). The more satisfied women felt with their sex lives, the more they had intercourse and the more attractive they felt compared to other women.

On self-reports, satisfaction with one's own current sexual responsiveness was positively correlated with frequency of orgasm ( $r = .48$ ;  $p < .01$ ), general attractiveness ( $r = .39$ ;  $p < .05$ ), sexual



Table 8  
Correlations Among Sexual Adjustment Measures--Combined Groups

|  | Sexual Arousability<br>Inventory | Satisfaction<br>With Sex Life |
|--|----------------------------------|-------------------------------|
| Sexual responsiveness<br>Significance level                                | 0.746<br>0.0001                  | 0.434<br>0.03                 |
| Coital frequency<br>Significance level                                     | 0.123<br>0.57                    | 0.509<br>0.01                 |
| Orgasm frequency<br>Significance level                                     | 0.42<br>0.04                     | 0.39<br>0.058                 |
| Orgasm with penile<br>penetration<br>Significance level                    | 0.418<br>0.04                    | 0.193<br>0.36                 |
| General attractiveness<br>Significance level                               | 0.313<br>0.135                   | 0.447<br>0.02                 |
| Sexual attractiveness<br>Significance level                                | 0.391<br>0.06                    | 0.467<br>0.02                 |
| Sexual responsiveness:<br>comparative<br>Significance level                | 0.643<br>0.0007                  | 0.335<br>0.10                 |
| Satisfaction with partner's<br>sexual responsiveness<br>Significance level | -0.018<br>0.93                   | 0.392<br>0.078                |

Table 9

## Correlations Among Sexual Adjustment Measures--Combined Groups

|  | Coital Frequency | Orgasm Frequency |
|--|------------------|------------------|
| Satisfaction with sex life                           | 0.509            | 0.391            |
| Significance level                                   | 0.01             | 0.058            |
| Current sexual responsiveness                        | 0.14             | 0.489            |
| Significance level                                   | 0.52             | 0.01             |
| Coital frequency                                     |                  | 0.184            |
| Significance level                                   |                  | 0.40             |
| Orgasm with penile penetration                       | 0.225            | 0.348            |
| Significance level                                   | 0.30             | 0.09             |
| General attractiveness                               | 0.22             | 0.464            |
| Significance level                                   | 0.31             | 0.02             |
| Sexual attractiveness                                | 0.385            | 0.57             |
| Significance level                                   | 0.07             | 0.004            |
| Sexual responsiveness:<br>comparative                | -0.089           | 0.673            |
| Significance level                                   | 0.68             | 0.0003           |
| Satisfaction with partner's<br>sexual responsiveness | 0.43             | 0.379            |
| Significance level                                   | 0.057            | 0.09             |

attractiveness compared to other women ( $r = .47$ ;  $p < .02$ ), and sexual responsiveness as compared with other women ( $r = .71$ ;  $p < .0001$ ). Frequency of orgasm was positively correlated with general attractiveness as compared to other women ( $r = .46$ ;  $p < .02$ ), sexual attractiveness compared to other women ( $r = .57$ ;  $p < .004$ ), and sexual responsiveness compared to other women ( $r = .67$ ;  $p < .0003$ ).

Thus, the more attractive in a general and sexual way a woman in this study thought she was, the more satisfied she reported her current sexual responsiveness to be and the more frequently she experienced orgasm. Orgasm frequency, however, was not significantly related to coital frequency ( $r = .18$ ;  $p < .40$ ) or satisfaction with her partner's sexual responsiveness ( $r = .37$ ;  $p < .09$ ).

The higher a woman scored on the Sexual Arousalability Inventory (SAI), the more sexually responsive she believed herself to be currently ( $r = .74$ ;  $p < .0001$ ) and compared to other women ( $r = .64$ ;  $p < .0007$ ), the more she experienced orgasm during penile penetration without concurrent clitoral stimulation ( $r = .41$ ;  $p < .04$ ). Orgasm during penetration alone was experienced by half of the total sample, thus supporting Helen Kaplan's (1974) notion that 50% of women need additional direct clitoral stimulation for orgasm.

### Breast Reconstruction

Within the mastectomy group, there were significant differences between women who received breast reconstruction plastic surgery and those who did not. Of the 13 mastectomized women, five had breast reconstruction. All five spontaneously mentioned this surgery and

stated that it had made a very positive impact on their feelings of attractiveness. As seen in Table 10, on a one-tailed  $t$ -test with unequal  $n$ 's, there were significant differences between the groups ( $t = -3.01$ ;  $p < .01$ ) on the Sexual Arousability Inventory; thus, women who did receive mammoplasty rated themselves as more highly aroused by various sexual stimuli than did those who had not had reconstruction. On Table 11 it may be seen that this difference was significant for neither coital frequency ( $t = -1.68$ ;  $p < .13$ ) nor frequency of orgasm ( $t = -0.91$ ;  $p < .38$ ). On measures of general and sexual attractiveness when compared with other same-age women, there was a nonsignificant but interesting difference. Women with breast reconstruction tended to rate themselves as more sexually attractive than did those who had not had reconstruction. On a scale of 1 to 10, with 10 representing the maximal degree of sexual attractiveness, the reconstruction group had a mean of 6.9 while the nonreconstruction groups had a mean of 4.7.

Additionally, women who had reconstruction rated themselves as more satisfied with their current sexual responsiveness ( $t = -2.7$ ;  $p < .02$ ) and their sexual responsiveness in comparison with other same-age women ( $t = -2.17$ ;  $p < .05$ ) than did those women who did not choose to have reconstructive surgery.

There were no significant differences in scores on the Awareness of Physiological Changes Inventory ( $t = .74$ ;  $p < .48$ ), Self-Concept Scale ( $t = .14$ ;  $p < .88$ ), or the Body Cathexis Scale ( $t = -0.45$ ;  $p < .66$ ). Women who had reconstruction, however, tended to have positive feelings about their bodies (mean score of 2.2 on a scale with a

Table 10

T-test Comparisons on Items From the Sexual Arousability Inventory  
for Women With Breast Reconstruction and Those Without Reconstruction

| Variables                  | Breast<br>Reconstruction |           | No<br>Reconstruction |           | <u>T</u> |
|----------------------------|--------------------------|-----------|----------------------|-----------|----------|
|                            | Mean                     | <u>SD</u> | Mean                 | <u>SD</u> |          |
| Reading pornographic books | 2.80                     | 0.44      | 1.375                | 1.92      | -2.01    |
| Significance level         | <u>0.07</u>              |           |                      |           |          |
| Seeing porno pictures      | 2.80                     | 1.64      | 1.125                | 1.64      | -1.78    |
| Significance level         | <u>0.10</u>              |           |                      |           |          |
| Hearing sounds of pleasure | 4.40                     | 0.54      | 1.875                | 0.99      | -5.90    |
| Significance level         | <u>0.0001</u>            |           |                      |           |          |
| Reading porno poetry       | 2.20                     | 1.30      | 1.375                | 1.68      | -0.98    |
| Significance level         | <u>0.34</u>              |           |                      |           |          |
| Dancing                    | 2.40                     | 1.14      | 1.375                | 1.06      | -1.61    |
| Significance level         | <u>0.14</u>              |           |                      |           |          |
| Seeing a strip show        | 1.80                     | 1.78      | -0.875               | 3.39      | -1.85    |
| Significance level         | <u>0.09</u>              |           |                      |           |          |
| Seeing a porno movie       | 2.20                     | 2.16      | 0.50                 | 1.85      | -1.45    |
| Significance level         | <u>0.18</u>              |           |                      |           |          |
| Masturbation               | 1.60                     | 2.50      | 1.750                | 2.18      | 0.11     |
| Significance level         | <u>0.91</u>              |           |                      |           |          |

Table 10

Continued

| Variables              | <u>Breast<br/>Reconstruction</u> |           | <u>No<br/>Reconstruction</u> |           | <u>T</u> |
|------------------------|----------------------------------|-----------|------------------------------|-----------|----------|
|                        | Mean                             | <u>SD</u> | Mean                         | <u>SD</u> |          |
| Breast fondling        | 3.00                             | 1.22      | 3.25                         | 2.12      | 0.26     |
| Significance level     | <u>0.79</u>                      |           |                              |           |          |
| Having nipples touched | 3.80                             | 1.30      | 2.87                         | 1.80      | -1.06    |
| Significance level     | <u>0.30</u>                      |           |                              |           |          |
| Fellatio               | 4.20                             | 0.83      | 1.62                         | 2.13      | -3.05    |
| Significance level     | <u>0.01</u>                      |           |                              |           |          |
| Cunnilingus            | 4.40                             | 0.54      | 3.37                         | 1.99      | -1.37    |
| Significance level     | <u>0.20</u>                      |           |                              |           |          |

Table 11  
T-test Comparisons Between Women With Breast Reconstruction  
and Those Without Reconstruction on Subjective Variables

| Variables                               | Breast Reconstruction |           | No Reconstruction |           | <u>T</u>  |
|---|-----------------------|-----------|-------------------|-----------|-----------|
|   | Mean                  | <u>SD</u> | Mean              | <u>SD</u> |           |
| Sexual Arousalability Inventory         | 96.40                 | 18.56     | 60.75             | 23.75     | -3.01**** |
| Orgasm frequency                        | 3.20                  | 1.30      | 2.50              | 1.41      | -0.91     |
| Coital frequency                        | 2.12                  | 0.85      | 1.21              | 0.92      | -1.68     |
| General attractiveness                  | 6.30                  | 3.11      | 5.87              | 2.60      | -0.25     |
| Sexual attractiveness                   | 6.90                  | 2.19      | 4.71              | 2.48      | -1.61     |
| Current sexual responsiveness           | 9.30                  | 0.83      | 5.75              | 3.50      | -2.74***  |
| Sexual responsiveness: comparative      | 8.80                  | 1.78      | 6.50              | 1.94      | -2.17*    |
| Awareness of physiological changes      | 22.40                 | 6.06      | 24.75             | 4.62      | 0.74      |
| Self-Concept Scale                      | 7.80                  | 9.90      | 8.50              | 4.59      | 0.14      |
| Body Cathexis Scale                     | 2.20                  | 11.23     | -1.0              | 14.07     | -0.45     |
| Subjective sexual turn-off: all stimuli | 0.03                  | 0.06      | 0.55              | 0.52      | 2.55**    |

\*Significant at  $p < .056$  level.

\*\*Significant at  $p < .04$  level.

\*\*\*Significant at  $p < .02$  level.

\*\*\*\*Significant at  $p < .01$  level.

range of -3 to +3) compared to those who had not had mammoplasty (mean score of -1).

When a composite measure for sexually turned-off (tense, embarrassed, and offended) was used, the results indicated that the non-reconstruction group was more sexually turned-off to the erotic film than the reconstruction group ( $t = 2.40$ ;  $p < .04$ ). This was also true for overall reactions to all of the stimuli ( $t = 2.55$ ;  $p < .04$ ).

Table 12 summarizes the comparisons in scores on the Sexual Arousability Inventory for women who have not had breast reconstruction with those women in the control group. Significance was found on three variables: seeing pornographic pictures ( $t = 2.37$ ;  $p < .03$ ), hearing sounds of pleasure during love-making ( $t = 2.17$ ;  $p < .04$ ), and seeing a pornographic movie ( $t = 2.65$ ;  $p < .01$ ). These were all in the expected direction, with control subjects indicating greater arousal than mastectomees without mammoplasty.

### Race

There were no significant differences when Caucasians were compared with non-Caucasians (Korean, Japanese, Filipino, and Chinese). Physiological and phenomenological reactions to the seductive and erotic stimuli were very similar between racial groups except on subjective sexual arousal (composite measure combining sexually aroused, liked, and interested) to the mildly seductive audiotape I ( $t = -2.05$ ;  $p < .05$ ). That is, Caucasians were significantly more sexually aroused on self-report to this seductive stimulus than were non-Caucasians. As the stimuli became more blatantly erotic, there were no significant differences between the racial groups.



Table 12  
T-test Comparisons on Items From the Sexual Arousability  
Inventory for Women With No Breast Reconstruction  
and Control Group

| Variables                       | No<br>Reconstruction |           | Control |           | <u>T</u> |
|---------------------------------|----------------------|-----------|---------|-----------|----------|
|                                 | Mean                 | <u>SD</u> | Mean    | <u>SD</u> |          |
| Reading porno books             | 1.37                 | 1.92      | 2.72    | 1.84      | 1.53     |
| Significance level              | <u>0.14</u>          |           |         |           |          |
| Seeing porno pictures           | 1.12                 | 1.64      | 2.90    | 1.57      | 2.37     |
| Significance level              | <u>0.03</u>          |           |         |           |          |
| Hearing sounds of pleasure      | 1.87                 | 0.99      | 3.09    | 1.44      | 2.17     |
| Significance level              | <u>0.04</u>          |           |         |           |          |
| Reading porno poetry            | 1.37                 | 1.68      | 2.45    | 2.01      | 1.26     |
| Significance level              | <u>0.22</u>          |           |         |           |          |
| Dancing                         | 1.37                 | 1.06      | 2.27    | 1.42      | 1.57     |
| Significance level              | <u>0.13</u>          |           |         |           |          |
| Seeing a strip show             | -0.87                | 3.39      | 1.72    | 1.19      | 2.07     |
| Significance level <sup>a</sup> | <u>0.07</u>          |           |         |           |          |
| Seeing a porno movie            | 0.50                 | 1.85      | 2.72    | 1.73      | 2.65     |
| Significance level              | <u>0.01</u>          |           |         |           |          |
| Masturbation                    | 1.75                 | 2.18      | 2.81    | 2.50      | 0.98     |
| Significance level              | <u>0.33</u>          |           |         |           |          |

Table 12

Continued

| Variables              | No<br>Reconstruction |           | Control |           | <u>T</u> |
|------------------------|----------------------|-----------|---------|-----------|----------|
|                        | Mean                 | <u>SD</u> | Mean    | <u>SD</u> |          |
| Breast fondling        | 3.25                 | 2.12      | 2.72    | 1.27      | -0.62    |
| Significance level     | <u>0.54</u>          |           |         |           |          |
| Having nipples touched | 2.87                 | 1.80      | 2.90    | 1.51      | 0.04     |
| Significance level     | <u>0.96</u>          |           |         |           |          |
| Fellatio               | 1.62                 | 2.13      | 2.27    | 1.73      | 0.70     |
| Significance level     | <u>0.49</u>          |           |         |           |          |
| Cunnilingus            | 3.37                 | 1.99      | 3.36    | 2.01      | -0.01    |
| Significance level     | <u>0.99</u>          |           |         |           |          |

<sup>a</sup>Assumption of equal variance was violated.

When comparing interview data in which subjects rated themselves on general and sexual attractiveness and responsiveness, there were no significant racial differences. Both groups rated themselves as more than averagely satisfied with their current sexual responsiveness (mean of 6.16 for non-Caucasians and mean of 7.38 for Caucasians on a scale of 1 to 10), their sexual responsiveness compared with other same-age women (mean of 6.91 for non-Caucasians and a mean of 6.83 for Caucasians), sexual attractiveness (mean of 6.16 for non-Caucasians and a mean of 6.11 for Caucasians), and general attractiveness (mean of 5.5 for non-Caucasians and 6.4 for Caucasians).

#### Order Effects

Order of stimulus presentation was counterbalanced to diminish spurious order effects on physiological reactivity to the stimuli. A repeated measures analysis of variance (treatment group x order x level of eroticism) was used on VPP data to determine the effects of order of presentation of stimuli on changes in vaginal pressure pulse (see Table 3). There was a significant eroticism effect ( $F = 3.92$ ;  $df = 2/32$ ;  $p < .03$ ), but no significant eroticism-treatment interaction. This was significant at the  $p < .05$  level with both Scheffe's and Newman-Keuls post-hoc analyses. The eroticism-order interaction was statistically significant at the .056 level ( $F = 3.14$ ;  $df = 2/32$ ;  $p < .056$ ). Thus, order and eroticism interaction did have some impact on VPP, though not at the  $\alpha = .05$  level. Order alone did not have a significant main effect. When the stimuli were presented in gradually increasing levels of eroticism, the VPP reactivity was similar for both

controls and experimental subjects. When the erotic film was presented first and then followed by the mild and medium audiotapes, the controls reacted differently from the mastectomy group; they had an initial high response followed by a sharp decrease and then slight increase when the audiotapes were presented (Film VPP  $\bar{X}$  = 9.23; Tape I VPP  $\bar{X}$  = 5.84; Tape II VPP  $\bar{X}$  = 6.27). The mastectomy group responded with a medium reactivity level for the film, increased for the mildly seductive audiotape, and then decreased for the medium seductive audiotape (Film VPP  $\bar{X}$  = 6.79; Tape I VPP  $\bar{X}$  = 7.37; Tape II VPP  $\bar{X}$  = 5.22).

To summarize, the following hypotheses were supported:

Hypothesis 1: Effects of stimulus eroticism on vaginal pressure pulse. Support was found for Parts A and C but not for Part B for both mean vaginal pressure pulse and maximum pressure pulse. Subjects responded with greater VPP reactivity to the erotic film than to the audiotapes. Significant differences were not found between groups.

Hypothesis 2: Effects of stimulus eroticism on subjective sexual arousal. Support was found for Parts A and C but not for Part B. Subjects reported greater sexual arousal to the erotic film than to the audiotapes.

Hypothesis 5: Relationship between physiological arousal (VPP changes) and subjective sexual arousal was predicted to be more positive in controls than in mastectomees. Support was found for both mean and maximum measures of VPP and the composite variable of subjective sexual arousal. Controls had a more positive correlation

between bodily changes (VPP) and subjective reports of sexual arousal in response to the erotic film than did mastectomees. Second, mastectomees had significantly higher negative correlations between VPP changes and subjective sexual turn-off than did controls.

The following hypotheses were not supported:

Hypothesis 3: Effects of stimulus eroticism on heart rate.

There were no significant differences in heart rate reactivity to either of the audiotapes or the erotic film.

Hypothesis 4: Effects of mastectomy on body image. There were no significant differences between mastectomees and controls on mean scores on the modified Body-Cathexis Questionnaire.

Hypothesis 6: Effects of mastectomy on sexual responsivity as measured by the Sexual Arousability Inventory. There were no significant differences between controls and mastectomees on the mean scores on the SAI.

Hypothesis 7: Effects of mastectomy on awareness of physical changes during sexual arousal. No significant differences in mean scores on the Awareness of Physiological Changes inventory were found between controls and mastectomees.

Hypothesis 8: Effects of time on sexual adjustment of mastectomees as measured by correlations between VPP changes and subjective sexual arousal. No support was found.

Other statistical data were as follows:

Sexual reactivity: The more satisfied women felt with their sex lives, the more they had intercourse and the more attractive they

felt in general and sexually in comparison with other same-aged women.

Breast reconstruction: Mastectomees who had breast reconstruction rated themselves as more highly aroused by a variety of sexual stimuli and situations, as measured by the Sexual Arousability Inventory (SAI), than did those who had not had this surgery. Those without reconstruction rated themselves as significantly more sexually turned-off by the erotic film and audiotapes in this experiment than did those with reconstruction. Mastectomees without reconstruction reported less arousal (SAI data) than controls for seeing pornographic movies and pictures and in hearing sounds of pleasure during love-making. Significant differences between the reconstruction and no-reconstruction groups of mastectomees were not found for most SAI categories or for self-ratings of attractiveness, self-concept, and coital and orgasm frequencies.

Race: No significant differences between races were found.

Order: No significant main effects for order or treatment group were found. There was a significant main effect for eroticism and eroticism-order interaction.

## CHAPTER V

### SUMMARY, DISCUSSION, AND IMPLICATIONS

#### Summary

In this study of 13 mastectomized women and 11 controls of approximately the same age, race, and years married, the reactions to seductive and erotic stimuli were measured physiologically with a recording of vaginal pressure pulse (VPP) and phenomenologically by self-report. Also interview data and paper-and-pencil measures were collected to measure self-concept, body cathexis, sexual arousability, awareness of physiological changes during sexual arousal, family history, marital and sexual satisfaction, mastectomy and reproductive history, and demographics. The research aimed to expand the information about female sexuality to older women, different racial groups, and mastectomized women, thus broadening understanding about the range of female sexual functioning. It further attempted to ascertain the relationship between physiological and subjective sexual arousal and to study in vivo sexual responsivity to erotic materials. Focus on physical measures of arousal continued the trend away from total reliance on self-report and retrospective data on sexuality, which, to date, have provided norms about sexual functioning in the United States (Fisher, 1973; Hite, 1976; Hunt, 1974; Kinsey et al., 1953; Terman, 1938). Mastectomy was chosen because of the belief that it creates significant trauma in a woman's life, her body image,

self-esteem, and sexuality (Bacon et al., 1952; Goins & Goins, 1981; Goldsmith & Alday, 1971; Greer & Morris, 1975; Klein, 1971; Kushner, 1975; Ray, 1977; Renneker & Cutler, 1952; Renneker et al., 1963; Reznikoff, 1955; Roberts et al., 1972; Tarlau & Smalheiser, 1951; Wheeler & Caldwell, 1955; Witkin, 1978; and others).

Subjects were shown seductive and erotic stimuli while vaginal pressure pulse was recorded by a vaginal photoplethysmograph and self-reports were made about their subjective reactions. The following results were found:

1. There was significantly more vaginal pressure pulse reactivity to the erotic film than to the two seductive audiotapes.
2. Mastectomees and controls did not significantly differ in their vaginal pressure pulse reactivity to the erotic film.
3. Significant differences in subjective perceptions of arousal were found for the erotic film versus the seductive tapes, thus supporting Heiman's (1977) conclusion that increasing explicitness of erotic stimuli increases sexual arousal in women.
4. Control women did not respond with greater subjective sexual arousal than did mastectomees.
5. Heart rate did not differ significantly in response to the erotic film and the audiotapes.
6. Self-esteem, body cathexis, awareness of physiological changes during sexual arousal, coital and orgasm frequency, satisfaction with sexual responsiveness, and attractiveness compared to other same-age women were essentially similar for the total sample.



7. Control-group women had a higher positive correlation between measures of physiological sexual arousal (VPP) and subjective reports of arousal in response to the erotic film than did mastectomees.

8. No differences between controls and mastectomees were found on overall sexual responsivity as measured by the Sexual Arousability Inventory.

9. Increases in time post-mastectomy did not result in higher positive correlations between physiological sexual arousal and self-report of arousal.

10. Women with breast reconstruction rated themselves as more satisfied with their current sexual responsivity, sexual attractiveness, and sexual responsivity compared to other same-age women than mastectomees without reconstruction.

11. Women who had breast reconstruction reported greater arousal to a greater variety of erotic stimuli (Sexual Arousability Inventory) compared with mastectomees who did not have reconstruction.

12. No significant differences between Caucasians and non-Caucasians (Japanese, Korean, Filipino, and Chinese) were found on any measures.

### Discussion

The results of this discussion indicate that the experience of mastectomy for women in middle adulthood was emotionally traumatic, but was, more importantly, on self-report, a short-lived trauma: an experience which women passed through, grieved, and then accepted, a trauma without apparent long-term scars on self-concept, sexual

functioning, feelings of physical attractiveness and femininity, or relationship with husbands. This was especially true for women who had breast reconstruction plastic surgery. Mastectomized women were quite comparable to nonmastectomized women on most of the variables studied. They reported similar degrees of sexual arousal and satisfaction, coital frequency, orgasm frequency, and enjoyment of various sexual practices in their relationships with husbands or sexual partners. They felt adequate degrees of self-confidence, yet tended to view their bodies in a nonpositive manner. They reported greater satisfaction with their husbands than did control women.

However, in the laboratory setting, there were differences in sexual arousal. Control-group women were more subjectively sexually aroused when viewing seductive and erotic stimuli than were mastectomized women. Also, there was positive correlation between physiological arousal and phenomenological labeling of that state as sexual arousal in control-group women; this was not true for mastectomized women. They, instead, were able to label that physiological state as "not sexually turned-off" but not as "sexually aroused." How is this to be explained?

In this chapter, the results are explained and discussed using the following topic areas: self-concept, feelings of attractiveness, sexual functioning, and relationship with husband. Additionally, limitations of the research are elucidated and future research issues suggested.

### Self-Concept

Both the control group and the experimental group tended to rate themselves as self-confident (assertive, confident, sure of themselves, likable, intelligent); there were no statistically significant differences. What was noticeable was a stronger sense of personal fortitude or inner strength among the experimental subjects. This was not ascertained directly via questions, but tended to be brought up spontaneously by subjects as they described their experiences in identifying their breast lumps, having surgery, and recovering. They expressed pride at their survival, their battles with cancer. Most had passed at least two years since cancer was diagnosed and were outwardly confident that the cancer had been detected and treated early enough and thus was not as much of a threat to their lives. Yet, they were not immune to fears of early death. Several made statements of how they silently sighed relief as anniversary dates came and went without cancer recurrence.

Further, there was clearly more expressed appreciation for life, and concentration on enjoying life rather than taking it for granted. Days were precious; time was spent in what they defined as meaningful ways. All of this points to an underlying awareness of life's finiteness and the danger to life which they felt. Yet only one subject stated that she was depressed. This may be explained as evidence of psychological denial of sadness of depression or as due to the non-representativeness of the sample. Clearly, the women who volunteered to participate did so because they felt they were in good shape physically and emotionally. Almost all expressed a desire to "help

other women" as their primary motivation for participation (two women stated that they would donate the money received for participation to the American Cancer Society). And several stated that they wanted research to challenge the idea that mastectomy is highly traumatic and "wrecks" a woman's life.

Another explanation is that the women in the sample had completed most of their grieving about their cancer, their loss of a breast, and now were valuing life with renewed interests because of their brushes with death. The shock-anger-depression-acceptance cycles (Kubler-Ross, 1969) were coming to a close, or at least an apparent close. More than one woman stated that "you can feel sorry for yourself for only so long, then you have to decide to keep living." It was this attitude that was representative of this sample. Self-reports implied that the "positiveness" resulted from the survival experience and subsequent evaluation of what was important in life.

Early researchers in the field of psychological reactions to mastectomy (Bacon et al., 1952; Renneker & Cutler, 1952; Renneker et al., 1963) commented on the tendency of mastectomized women to camouflage anger with pleasantness. The absence of anger and bitterness was noted in this sample; however, subjects mentioned frequently that they had passed through feelings of depression and anger at the threat to their lives and that those feelings tended to occur immediately after the diagnosis and surgery. It is impossible with this research to determine whether the positive attitude toward self and life which was noted in the experimental group was present prior to the discovery of cancer or subsequent to it. Several drew strength

from religion; all evaluated their lives in light of the danger. All chose to reprioritize what was important, with many focusing on their marriages and relationships with children.

The control group perceived themselves as loving and family-oriented, but there was more emphasis placed on personal fulfillment such as in a career or hobby than on marital satisfaction. Perhaps self-concept in control women was supported by feelings of success in endeavors in their world, whereas mastectomized women gained increased confidence in their internal battle with cancer and the survival and relied then on husbands for emotional need satisfaction.

#### Attractiveness

Body image, feelings of femininity, and sexual attractiveness all contribute to a general belief that one is an attractive woman. In this sample, women in both groups perceived themselves as attractive despite neutral or negative reactions to various body parts. Fourteen of 24 women (58%) scored in a negative direction when all body parts were evaluated. In response to a question about total body appearance, 38% of the mastectomy group and 45% of the controls rated themselves as having negative feelings. Most of this was explained as due to excess weight. In fact, only 20% of the sample was pleased with their current weight. Other areas rated most negatively were hips, stomachs, and thighs. This is of interest in that they rated themselves as more than averagely attractive in general, and more sexually attractive than the average woman their age. Perhaps this is due to the recognition that as a woman in middle adulthood one does not

physically look like the women who are defined as most attractive in the United States culture (i.e., Playboy models; fashion models; young, thin, beautiful women), but when comparing oneself to cohorts, one compares with those who are less attractive. There is more emphasis on the total person, not just the external appearance, when determining one's own attractiveness.

This factor was true for sexual attractiveness and responsiveness, too, which raises questions as to the relationship between body image and sexual responsivity. In this sample, many women, as stated, had negative feelings toward parts of their bodies; yet, they tended to rate themselves as more sexually attractive than average and even more satisfied with their sexual responsiveness (7 on a 1 to 10 scale). The quality of the relationship with the sexual partner was more important than body image for full sexual responsiveness. From interview data it appeared that there was comfort with their sexual expression for most of the women; sexual arousal and satisfaction existed independently without conscious reference to the shape the body was in at the particular time.

When the groups were looked at separately, a few differences emerged. During the interview, two women mentioned that they felt less feminine than other women; both had had mastectomies. One of these also experienced a hysterectomy within nine months of the mastectomy. And for both, the "lack of femininity" feeling was described as in the past, part of the adjustment. Women who chose to have breast reconstruction rated themselves as more sexually attractive (though not more attractive in general) than mastectomized women who

did not have mammoplasty. Those women tended to play down the importance of the missing breast, to make comments that it was "ridiculous" or narcissistic to have such surgery. Those who had reconstruction sang the highest praises for it. In fact, several described in detail how simple the surgery was (despite the fact that there were usually a couple of surgeries involved), and one woman spontaneously showed her reconstructed breast!

Those with reconstructed breasts also rated themselves as more sexually aroused (SAI) to various erotic experiences and more satisfied with their sexual responsivity than those without reconstruction. It may be posited that those women who chose reconstruction valued breasts more and viewed breasts as more central to sexual response and attraction than did other women. However, this did not seem to be entirely true. Two women stated that their breasts were not that important to them prior to surgery but that doctors suggested reconstruction and they followed through in order to make their clothes fit better.

The reconstructed breast may speed the woman's acceptance of her mastectomy by facilitating defensive denial. She sees a breast instead of a scar; others see two symmetrical breasts even when she is undressed. It would be easier to deny the loss when it is less physically obvious. And it is her sense of sexual attractiveness rather than general attractiveness which tends to be improved with reconstruction. She knows she has two breasts, so when fantasizing about sex, she may feel more attractive (and may feel more sexually attractive when engaged in a sexual encounter) than the woman with no reconstruction. This theory

was supported in part in this research in that all the women who were either not currently married or who had more than one sexual partner had reconstruction except one. This woman believed that breast fondling was essential to satisfying sex yet would not allow a man to fondle her remaining breast. When asked if she considered reconstruction, she replied that she was too old (56 years) and that her surgery had been done in such a way as to make mammoplasty difficult. She had resigned herself to a life of lack of sexual satisfaction.

Those women who were married had already faced their husbands' reactions to their surgery. In all cases, the husband was reassuring; he made it clear that his love was not dependent on the existence of two breasts but that he instead loved his wife. After passing that hurdle, it was easier for women to accept their mastectomies. However, those women who have different sexual partners must go through the anticipation of his reaction with every new partner. It is no wonder that reconstruction was sought by women with more than one sexual partner more often than by married women. There would be less explaining and less risk of rejection when the lost breast is replaced.

### Sexual Functioning

The area of sexual functioning displayed interesting differences between the two groups studied. In terms of sexual experience including arousal, orgasm, coital frequency, and satisfaction, there were no differences. That is, both groups reported similar levels of sexual activity and degrees of satisfaction with their partners outside of the laboratory setting. However, within the experimental setting, the



control group indicated more sexual arousal phenomenologically and displayed a stronger positive relationship between physiological sexual arousal (measured by both vaginal pressure pulse in general and during maximal arousal) and subjective perception and labeling of that arousal as "sexual" in response to the erotic film than did the mastectomy group.

As physiological arousal increased, the mastectomized women rated themselves as less sexually turned-off ( $p < .008$ ) but not as more sexually turned-on ( $p < .66$ ). For the control group, there was significant reporting of sexual turn-on as physiological arousal increased ( $p < .01$ ), but no relationship between that arousal and a lesser degree of sexual turn-off ( $p < .69$ ). This strongly suggests that the two composite variables (sexual turn-on and sexual turn-off) do not represent mirror images of one another; they are at least partially independent. For mastectomized women, there was physiological arousal and lack of perception (due to low levels of arousal) or a refusal to label that as sexual arousal, whereas control women labeled their physical reactions as sexual arousal. When the mastectomy group was subdivided into those who had had breast reconstruction and those who had not, it became clear that there was more sexual "turn-off" to both the erotic film and to the stimuli in general for the nonreconstruction group. There were no significant differences between these subgroups on their levels of subjective sexual arousal (turn-on).

Because there were no significant differences between the control and experimental groups in the degree of physiological arousal to the erotic film or to the seductive audiotapes, the perceptual differences

between the groups cannot be explained by low levels of physiological arousal, and therefore difficulties in identifying the physiological change. Rather, explanation must be at the phenomenological level. These 20 women responded body-wise in similar ways to the stimuli, but they labeled their subjective experience of this physiological change in different ways. And there were different ways of labeling the physiological changes between women who had breast reconstruction and those who had not.

The mastectomy experience may have left these women with less ability to state openly that they were sexually aroused in an atypical setting (the laboratory) than the control women, who labeled these changes more often, and to a higher degree, as sexual arousal. The mastectomy group apparently had some hesitation in acknowledging their arousal to themselves and/or to the experimenter. To generate plausible explanations, one must isolate a few of the variables.

Could refusal to acknowledge sexual arousal in the laboratory setting be due to negative attitudes about pornography? On the Sexual Arousal Inventory, the control group scored a higher mean in response to their degree of sexual arousal when viewing pornographic movies ( $\bar{X} = 2.72$  for controls;  $1.15$  for experimentals; ( $p < .055$ ). Differences were evident, but not statistically significant, when the mastectomy group was subdivided into those who had had breast reconstruction and those who had not ( $\bar{X} = 2.2$  for reconstruction;  $.5$  for those without). Thus, there was more self-reported arousal for women who had mastectomies with subsequent mammoplasty. Since anxiety typically is the block to sexual arousal in females

(Kaplan, 1974, 1979), it may be especially present in mastectomized women without breast reconstruction; this could be ground for further research since anxiety was not measured in this study. Dislike of pornography with subsequent lack of sexual arousal was more pronounced in the nonreconstruction group than in either the controls or the reconstruction group: arousal when reading pornographic stories ( $\bar{X}$  = 2.7 for controls; 2.8 for reconstruction; 1.3 for nonreconstruction), arousal when viewing pornographic pictures or slides ( $\bar{X}$  = 2.9 for controls; 2.8 for reconstruction; 1.12 for nonreconstruction); and arousal when reading suggestive or pornographic poetry ( $\bar{X}$  = 2.9 for controls; 2.2 for reconstruction; .87 for nonreconstruction). See Tables 10 and 12. These approached significance, and with larger sample sizes, might reach statistical difference.

Does mammoplasty with its restoration of the body to almost its pre-mastectomy appearance reduce anxiety about sexual arousal in mastectomized women? It appears that this was the case. Those women with reconstruction were more aroused overall on the Sexual Arousal Inventory, were more sexually aroused to pornography, rated themselves as more satisfied with their current sexual responsiveness, rated themselves as more sexually responsive than other same-age women (this was significant at  $p < .056$ ), and were less sexually turned-off to the stimuli in this research and to the erotic film in particular. Possible confounding factors were the women's pre-mastectomy attitudes and arousal to pornography and sexual activities. It could be that she was more aroused, had more "liberal" attitudes, and thus chose mammoplasty to increase her positive feelings about her appearance

and to reduce her anxiety about her sexual functioning. There was, however, little support for this explanation in this research. Both groups of mastectomized women had comparable attitudes toward their bodies, their sexual attractiveness (a trend was noticed here in favor of the reconstructive group), their general attractiveness as women, and their self-concepts. It became clearer, then, that breast reconstruction affected sexual arousal rather than more global feelings and attitudes about oneself.

Could it be that lack of phenomenological sexual arousal in the laboratory in mastectomized women was due to their limited degree of sexual experience? This would be a context explanation; i.e., sexual arousal can be defined as such only within specific parameters: certain partners, situations, types of activities. The mastectomy group was more monogamous than the control group; the reconstruction subgroup had experienced more marital disruption (divorce) than the nonreconstruction group (40% divorced in reconstruction group; 12.5% widowed in nonreconstruction group). This difference in the subgroups was exaggerated because of small sample size. Marital status, of course, does not necessarily imply monogamy or lack of it. However, on self-report, the control group spontaneously reported more sexual partners than the mastectomy group; this was also true of two of the reconstruction group (the two who were divorced). All the women in the study had been married for many years (dependent on age); thus it may be assumed that they all had extensive sexual experience with a single partner. It was the control group who had greater experience with sexuality outside of the marital relationship. They

had more sexual partners, they tended to enjoy pornography and masturbation more, they expressed more positive views about having multiple sexual partners, and several (including the two divorced women in the reconstruction group) mentioned their attraction to and experience with younger sexual partners. This "liberalism" about sex may have been related to their increased ease at reporting sexual arousal within the laboratory setting. Greater "liberalism" about sex may be explained by the selection process: those women who would volunteer to participate in research on "marriage and sexuality" would likely be different (more liberal, more experienced) than those who would not volunteer (Kaats & Davis, 1971).

A dilemma remains. Despite the tendency in the breast reconstruction group to report greater sexual arousal to a variety of erotic stimuli outside the laboratory setting, they did not report themselves as more sexually aroused to the erotic film than the women who had not had breast reconstruction. Thus, compared to the controls, they reported less sexual arousal. They did, however, report significantly less sexual turn-off than did those women without reconstruction. So they were less turned-off but not more turned-on. This paradox was explained when the composite variable of sexual arousal was broken down into its three parts: sexually aroused, liked, and interested. The reconstruction subjects scored higher means on "sexually aroused" in response to the erotic film than did those without reconstruction ( $\bar{X} = 2.2$  for reconstruction group;  $\bar{X} = .85$  for nonreconstruction). This difference, plus the fact that both

scored almost identical means for the "liked" response, reduced the overall differences when the data were collapsed.

How, then, does the experience of breast reconstruction reduce anxiety about acknowledging and reporting sexual arousal in atypical settings? Since the women who had reconstruction responded in a very similar manner to the control group, it appeared as if mammoplasty reduced feelings of loss, grief and depression over loss, and anxiety about sexual functioning. All women, except one, who had had mastectomies reported that they were doing well, their adjustment was accomplished, they felt good about themselves, their marriages, and their sexuality. Perhaps they denied the impact of the loss. With retrospective data and self-report, there are many opportunities for bias. This is less true for in vivo data such as that gathered in this study. It is entirely plausible that the women who did not elect to have breast reconstruction experienced a level of depression or anxiety which, though psychologically denied, effectively blunted their perceptions of low levels of sexual arousal. Avoidance of sexuality was true for one mastectomee. She reported that she had gained 50 pounds since the mastectomy, and that she maintained the extra weight in order to keep men from making sexual advances to her.

Denial as a psychological defense has been found to be the most commonly used coping mechanism after a mastectomy (Goin & Goin, 1981; Polivy, 1977). "The breast reconstruction relieved . . . the added burden that the sense of mutilation, loss, and fears of dependence had imposed on the midlife anxieties with which all must cope" (Goin & Goin, 1981, p. 227). Future research must focus on anxiety about

sexual functioning in women who have mastectomies before and after breast reconstruction.

#### Relationship With Husband

During the interview, married women who had mastectomies provided glowing descriptions of their husbands. They stated that their marriages were wonderful, their husbands were totally supportive and loving, and that these reactions by husbands were somewhat unexpected. Each woman who made a glowing report also stated that she felt very fortunate that her husband had not abandoned her after the surgery as other men had done to their wives (as they feared would happen?). From the interview data, impressions emerged regarding the tendency to overvalue the husband. Perhaps she feared some defectiveness as a woman. For example, "I am not attractive sexually; I have this ugly scar and yet he stays with me. He must be a very good man." Perhaps the experience of trauma pulled the couple together and strengthened their bond.

This overvaluing of the husband was more highly representative of the experimental group than the controls, and it accompanied the generally positive attitudes toward life which the mastectomized women had. Was this a Pollyanna-ish denial of troubles, emotional pain, depression, and loss? Or was it indicative of an acceptance of a possible early death and subsequent appreciation of present life? Or was it perhaps a pseudo-acceptance of the cancer and mastectomy, a covering-over of the depression in order to avoid feelings of grief, dependency, and vulnerability? Or was it a reflection of acceptance of the dependency felt toward the husband?

Clinical impressions gathered from the interview data support the concept of pseudo-acceptance (a term used by Goin & Goin, 1981). Eleven of 13 mastectomees presented themselves as strong, unfearful, nondepressed, positive, in-charge women. They strongly believed that their husbands were the most positive influences on their current functioning and recoveries. And they glossed over their losses. Many stated that they had "in the past" felt depressed or angry about the cancer and surgery, but that those feelings were behind them. Only those in the reconstruction group stated that sexual anxiety had accompanied breast loss. Again they presented themselves as intact and anxiety-free now, but not so much in the past. Many stated that they wanted to tell other women by their participation in this research that mastectomy was not that traumatic. Yet, there was a lingering sense that they overemphasized their full recoveries, their invulnerability, and lack of sadness or fear.

Perhaps the private experience of depression with its subsequent vulnerability and increased dependency was expressed within the marital relationship. They could feel dependent on their husbands, could feel that husbands were there emotionally for them, and then could translate their gratefulness and appreciation into a high valuing of the spouse. For example, "I am invulnerable, strong and whole because of my husband. He will protect me and care for me, so I may feel safe." The husband could, in turn, become more protective of his wife and re-evaluate the importance of her in his life. This would strengthen the marital bond.



This strong bond to the husband was not as true for the control-group women who not only had more marital disruption (separation, divorce, remarriage) but also tended to value their current husband or partner less. Statements such as "I'm married now for security, not love," "Sex is very good with my lover, but nothing with my husband," "My current partner doesn't appeal to me sexually," and present intercourse frequency as "not any more than I have to" support this notion. The control-group women tended to view marriage as less central to their sense of well-being and happiness than mastectomized women. One, in fact, reported: "I would love to prove myself, but I can't unless I'm on my own." This press for independence and self-esteem based on personal accomplishment versus marital satisfaction was true too for the two divorced mastectomees who had had breast reconstruction. Perhaps traditional role orientation has more to do with the degree of valuing of husbands and marriage versus self than the experience of cancer and mastectomy. This is ground for further research.

Additionally, within the control group, there was more interest in, or tolerance for, shorter-term relationships with men. There were more remarriages (15% for mastectomees; 45% for controls) and more non-marital sexual relationships for control-group women. Thus, although independent living without men was not of much interest, there was less expressed dependence on one man and one "forever" relationship for controls. They were more willing to take the risk of getting out of unsatisfactory marriages and relationships and beginning new ones. Based on clinical impressions, it appeared that mastectomees who had

breast reconstruction also felt more willingness to take the risk of a relationship with a new partner. Feeling and believing that one is at least somewhat self-sufficient and "whole" in terms of body appearance may be necessary factors for middle-aged women to risk being "in the market" for new male partners.

#### Limitations of This Research

The major limitations of this research were small sample size and a nonrandom sample. Despite the fact that all subjects were recruited from similar populations (University of Hawaii employees and readers of a well-circulated weekly newspaper), they did not necessarily represent the population of mastectomees at large nor the population of women in middle-adulthood because of volunteer bias and limited sample size. As stated above, people who volunteer for sex research tend to differ from those who would not volunteer (Kaats & Davis, 1971). Because of these limitations, the data should be perceived as indicative of trends in mastectomees and their comparably aged counterparts rather than as facts about these populations.

Steps were taken to eliminate any possible coercion of subjects. The experimental procedure was explained to each subject in the initial phone contact. Interested potential participants phoned the experimenter after learning about the research study from the weekly newspaper (editions of the Hawaii Sun-Press from seven different locations on Oahu), from the local Reach to Recovery volunteer meeting (a volunteer branch of the American Cancer Society which works specifically with mastectomized women), or from a friend. Several women declined

to participate after learning about the experimental procedure. During the first phase of the interview, the procedure was again explained, the informed consent was read, questions were answered, and the consent form was signed. One subject (mastectomee) declined participation in the physiological monitoring component of the experiment. One subject (mastectomee) returned for a second session for the physiological monitoring only to have the machine fail to function again. She refused to return a third time. Data from two other participants (one control and one mastectomee) were lost also because of malfunctioning of the vaginal photoplethysmograph.

Demand characteristics, that is, the tendency to respond in the desired direction when participating in an experiment, often are cited as confounding factors in sexuality research. They are viewed as either creating more sexual interest or responses than are actually present in order for the subject to please the experimenter or, especially with women, to elicit fewer sexual responses so she can maintain a "good image" (i.e., nonsexual) for the researcher. These demands were downplayed in this experiment by using a female experimenter who created an informal atmosphere (Abramson et al., 1975), designing minimal expectations for performance into the experiment, avoiding coercion by letting the subject withdraw at any time, and providing three levels of informed consent (phone description of the research, verbal description of the research at the start of the interview, and written consent). These procedures were stressed by Hoon (1979), Amoroso and Brown (1973), and Geer and Quartararo (1976). Debriefing was conducted post-experiment as suggested by Amoroso

(1977). These procedures controlled somewhat volunteer bias and demand characteristics; however, caution must be used in generalizing these results to the population at large.

One woman (a mastectomee) had negative reactions to participating after the experiment. She informed her husband of her participation after the fact; he became irate because she had shared "intimate details" of their sex life to a stranger. This problem was worked through by the couple, but did present stress to the subject.

Overall, participants were fully informed and they mostly experienced the experiment as interesting and as a good opportunity to discuss their feelings and opinions about sexuality and mastectomy with an interested woman. They were frank, and thus may have expressed views that are representative of women in their age group. This supports the notion that the results generated from this research are valuable indicators of trends in these populations of women.

Mechanical difficulties with the stimuli and the vaginal photoplethysmograph affected the research. Some of the vaginal pressure pulse recordings had to be discarded in total, and some portions had to be overlooked because of variations in the functioning of the machine. The stimuli at the outset were presented all in audiovisual format on a Beta-max videotape (the two seductive stimuli) and on a film cassette. However, the videotape self-destructed after the first subject and had to be recorded on an audiotape for use by other subjects. This had a serendipitous effect in that subjects could imagine in their own minds who the speaker was and what he looked like, thus

eliminating possible turn-off to the specific man presented on the videotape.

An additional limitation was the low level of arousal which was elicited by the stimuli. This accounted for the rather limited variability on the vaginal pressure pulse measure of sexual arousal. Had the stimuli been more erotic--such as if more explicit films were used--there would likely have been more physiological indicators of sexual arousal and statistical significance of differential VPP reactivity between types of stimuli.

#### Implications for Future Research

Several areas for continued research in sexuality and mastectomy have been raised above: degree of "positiveness" of life before and after cancer and mastectomy; level of anxiety regarding sexual functioning in mastectomees before and after breast reconstruction; degree of "traditional" role orientation in women pre- and post-mastectomy and in comparably aged women in general; amount of dependency on and valuing of husbands before and after experience with breast cancer; and use of a variety of erotic films to ascertain the effects on vaginal pressure pulse reactivity and phenomenological reporting of sexual arousal in middle-aged women. Most importantly, a larger group of women needs to be researched. This study did sample one of the largest numbers of subjects reported to date in research measuring vaginal and phenomenological reactivity to erotic stimuli (Geer et al., 1974; Heiman, 1975a; Hoon et al., 1976, 1977a, 1977b; Morokoff & Heiman, 1980; Wincze et al., 1976, 1978), but still the

numbers are too small for adequate generalization of research results. This will prove to be difficult especially when recruiting middle-aged women and mastectomees who tend to be less inclined to divulge information about their sexuality because of cultural proscriptions. This would be particularly true for certain racial and ethnic groups as well. Mastectomized women, at least in this research, tended to keep the fact of their mastectomy very private. Few told friends or acquaintances about their surgeries except for those people who were very close (immediate family and best friends). Thus, they are unlikely to come "out of the closet" to volunteer for sex research.

Within the group of mastectomees, more must be done to determine the effect of breast reconstruction. If this surgery does in fact, as this research indicates, promote more positive attitudes about self, sexuality, and quality of life, then it needs to be offered more widely to women who undergo mastectomy. And mastectomy surgery should consequently be performed with this in mind (i.e., surgical incisions made in areas of least visibility and breast reconstruction performed as soon as medically advisable). Longitudinal studies which involve data collection pre-mastectomy (perhaps while women await biopsy), immediately post-mastectomy, pre-reconstruction, and after reconstruction would identify factors which make a woman choose or not choose mammoplasty and point out how this surgery affects emotional recovery and life adjustment.

Because there is an implication that mastectomees use denial as a predominant defense mechanism (Bard, 1972; Goin & Goin, 1981; Jamison et al., 1978; Polivy, 1977), it would be useful to measure

this quantitatively rather than relying on clinical impressions. The treatment of the mastectomized woman typically supports her use of denial as a coping mechanism. Physicians frequently are unavailable for or do not initiate discussions about feelings associated with mastectomy with their patients; hospital staff focus on the physical recovery; Reach to Recovery volunteers discuss bras, exercise, and present a model of a well-adjusted mastectomee to newly mastectomized women; friends and family in most cultural groups are socialized to avoid initiating discussion about highly emotional and personal topics such as mastectomy. All of this encourages women to get on with their lives, to put the past behind them, to develop an attitude or a façade of invulnerability and acceptance. Yet, just maybe, this is not the most psychologically beneficial strategy for effecting emotional and physical recovery. This needs to be determined.

The relationship between sexual responsivity in a laboratory setting and in a "natural" setting needs clarification. No research to date has answered this question. Does physiological sexual arousal have much to do with sexual satisfaction and pleasure? Is it a more or less valid measure of arousal than phenomenological reports? Do women who have mastectomies have more difficulty in responding and attending to sexual stimuli in the laboratory (and, more importantly, in their lives) than women who have not had this body trauma? This research suggests that they do and that breast reconstruction reduces it. Is it anxiety that prevents awareness of sexual arousal in mastectomees? Direct measures of this, both state and trait, would be useful.

### Implications for Treatment

Despite similar physiological responsivity to erotic stimuli presented in a laboratory setting between controls and mastectomees, there was less subjectively perceived sexual arousal in women who had mastectomies but did not have breast reconstruction. This suggests that there is anxiety about sexuality which interferes with attention to sexual-arousal cues and/or reporting such arousal. Since the women in the study were frank and open in all areas of questioning, they likely were at least somewhat comfortable with the experimenter and thus could report sexual arousal if they felt it. Therefore, there is greater support for the hypothesis that their anxiety interfered with attention to bodily cues of arousal and cognitive labeling of those feelings as sexual. This anxiety was less for women whose bodies had been restored to almost pre-mastectomy appearance by breast reconstruction.

Although not insurmountable, mastectomy did seem to take a toll. In addition to the reported initial feelings of anger, grief, and fears of mutilation and early death, there was a lingering effect, though mild, on sexuality: a blunting of sexual arousal at the perceptual level. The body responds but the mind lags a bit. Women who have had mastectomies must learn to cope by denying, publicly and perhaps privately, their depression, grief, and increased feelings of vulnerability. One way in which this was accomplished for these research participants was to feel ever-more attached to their husbands and to feel very positive about and lucky to have such men. Marital complaints were almost nonexistent compared to the control group.



The reliance on husbands enabled them to express their dependency and vulnerability while presenting to the world a picture of a well-functioning, fully recovered, strong woman. One wonders what strategies a woman uses when she feels she must present an independent and invulnerable persona to the world and when she has no one with whom to let down, from whom to receive emotional support. For these women and for others, the experience of breast reconstruction helped. It enabled them to feel unmutilated, to feel "whole," to have something to show off.

Health-care providers must be aware of the mastectomee's emotional support system and her need to present a face to her doctor and to the world of invulnerability and casualness about her surgery. It is too easy to take her at face value, to assume that she has adequate support from family and friends. We must, as psychologists, physicians, and health-care providers, present her both with opportunities to let down her façade, to express grief over her loss no matter what her age or how long it has been since her mastectomy, and to provide her with information about and availability of breast reconstruction. Health insurance companies must provide reimbursement for this surgery; it is not simply cosmetic but rather may be a very central factor in her early and total emotional recovery from breast cancer and mastectomy.

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## APPENDICES

APPENDIX A

INFORMED CONSENT

## APPENDIX A

### INFORMED CONSENT

1. I understand that I am being asked to participate in a research study to learn more about women's emotions and sexuality. If I agree to participate, I will be asked questions about my feelings and attitudes about myself and my sexual life. I will be asked to fill out some questionnaires that ask about these same areas. Also I will be asked to allow the recording of the blood flow to my vagina. To measure this blood flow, I will place a small tampon-sized device into my vagina in private. I will remain fully clothed. I will then watch several short films and record my reactions to them. I understand that some of the films will be sexually explicit.
2. The recording of vaginal blood flow records only body functioning. No electrical current passes through my body in any way. The equipment is battery-operated and is electrically safe. The vaginal blood flow instrument could carry infection, but this is very unlikely because germicides are used to sterilize it and no one is allowed to participate if they have any genitourinary complaints, are pregnant, or are having their menstrual period, fever, or infectious medical disease.
3. I understand that in the unlikely event of physical injury resulting from research procedures, Michigan State University, its agents, and employees will assume that responsibility as required by law. Emergency medical treatment for injuries or illness is available where the injury or illness is incurred in the course of an experiment. I have been advised that I should look toward my own health insurance program for payment of said medical expenses. If I develop any emotional problems related to my participation in this research, I am expected to call the researcher for assistance.
4. I understand that I am free to discontinue my participation in the study at any time without penalty. I will be paid \$20.00 for my participation.
5. I understand that the information and results of the study will be treated in strict confidence and that I will remain anonymous. Within these restrictions, results of the study will be made available to me at my request at the completion of the study.
6. The value to be gained by my participation will be to provide information that will assist health care professionals in their understanding of women's feelings and attitudes about sexuality.

7. If I have questions about the study, I have discussed them to my satisfaction with the researcher.

I am freely consenting to take part in a scientific study being conducted by: DIANNE GERARD under the supervision of: NORMAN KAGAN, Ph.D. of MICHIGAN STATE UNIVERSITY, East Lansing, Michigan.

Date: \_\_\_\_\_

Signed: \_\_\_\_\_

Researcher: \_\_\_\_\_



APPENDIX B

PERSONAL INTERVIEW QUESTIONNAIRE

APPENDIX B  
PERSONAL INTERVIEW QUESTIONNAIRE

Pre-Stimulus

Age:

Marital Status: S M W D Sep.      Time Married:      Yrs. Married:

Education:

Occupation:

Race:

Number of Children & Ages:

Current Health:      Poor      Average      Excellent

Chemotherapy:

Radiation Therapy:

Menarche:      LMP:

Regular Menses:      Yes      No

Contraception:

No. of Pregnancies:      Number Live Births:

Vaginal Infection:

Date of Mastectomy:      Age at Mastectomy:

During childhood, whom did you live with?

Did your parents divorce?      Separate?      How old were you?

Did either parent die before you were 18?

Which parent?      How old were you?

Describe your relationship with your mother during your childhood:

During adolescence:

Describe your relationship with your father during your childhood:

Adolescence:

How many brothers and sisters did you have?

Did any die before you were 18?                      Who?

How old were you?

## PERSONAL INTERVIEW QUESTIONNAIRE

Post-Stimulus

How satisfied are you with your current sex life? 1.....10

How satisfied are you with your own sexual responsiveness? \_\_\_\_\_

Your partner's response to you?

Present frequency of intercourse:

How has your sex life changed in the last five years?

How often do you experience orgasm during sexual activity with your partner?

Never      25% of time      50% of time      75% of time      Always

How does orgasm usually occur?

- ☐ Hand stimulation of genitals/breasts
- ☐ Fantasy/dreams
- ☐ Oral stimulation of genitals/breasts
- ☐ During penetration
- ☐ During penetration with clitoral stim.
- ☐ During masturbation
- ☐ While using a vibrator

Compared with other women your age, how attractive would you rate yourself? 1.....10

How sexually attractive would you rate yourself? 1.....10

How sexually responsive would you rate yourself? 1.....10

List three words which best describe you:

APPENDIX C

BODY-CATHEXIS QUESTIONNAIRE

APPENDIX C

BODY-CATHEXIS QUESTIONNAIRE

Please rate the following parts of your body using this scale.

| -3                             | -2                   | -1                             | 0   | 1                              | 2                    | 3                              |
|--------------------------------|----------------------|--------------------------------|---|--------------------------------|----------------------|--------------------------------|
| strong<br>negative<br>feelings | negative<br>feelings | slight<br>negative<br>feelings | no<br>feeling<br>one way<br>or the<br>other | slight<br>positive<br>feelings | positive<br>feelings | strong<br>positive<br>feelings |

1. I have \_\_\_\_ feelings about my height.
2. I have \_\_\_\_ feelings about my weight.
3. I have \_\_\_\_ feelings about my face.
4. I have \_\_\_\_ feelings about my breasts.
5. I have \_\_\_\_ feelings about my waist.
6. I have \_\_\_\_ feelings about my hips.
7. I have \_\_\_\_ feelings about my stomach.
8. I have \_\_\_\_ feelings about my thighs.
9. I have \_\_\_\_ feelings about my calves.
10. I have \_\_\_\_ feelings about my ankles.
11. I have \_\_\_\_ feelings about my feet.
12. I have \_\_\_\_ feelings about my total body appearance.

APPENDIX D

SELF-CONCEPT SCALE

APPENDIX D  
SELF-CONCEPT SCALE

Compared to the average person my age, I generally consider myself:

- |  |                        |
|--|------------------------|
| 1. More intelligent:                                 | 2. More likeable:      |
| A. Strongly agree                                    | A. Strongly agree      |
| B. Moderately agree                                  | B. Moderately agree    |
| C. Slightly agree                                    | C. Slightly agree      |
| D. Slightly disagree                                 | D. Slightly disagree   |
| E. Moderately disagree                               | E. Moderately disagree |
| F. Strongly disagree                                 | F. Strongly disagree   |
| 3. More assertive:                                   | 4. More emotional:     |
| A. Strongly agree                                    | A. Strongly agree      |
| B. Moderately agree                                  | B. Moderately agree    |
| C. Slightly agree                                    | C. Slightly agree      |
| D. Slightly disagree                                 | D. Slightly disagree   |
| E. Moderately disagree                               | E. Moderately disagree |
| F. Strongly disagree                                 | F. Strongly disagree   |
| 5. More conscientious:                               | 6. More confident:     |
| A. Strongly agree                                    | A. Strongly agree      |
| B. Moderately agree                                  | B. Moderately agree    |
| C. Slightly agree                                    | C. Slightly agree      |
| D. Slightly disagree                                 | D. Slightly disagree   |
| E. Moderately disagree                               | E. Moderately disagree |
| F. Strongly disagree                                 | F. Strongly disagree   |
| 7. How often do you feel self-conscious?             |                        |
| A. Very often  |                        |
| B. Fairly often                                      |                        |
| C. Sometimes   |                        |
| D. Rarely  |                        |
| E. Practically never                                 |                        |
| 8. How sure of yourself do you feel among strangers? |                        |
| A. Very sure of myself                               |                        |
| B. Considerably sure of myself                       |                        |
| C. Somewhat sure of myself                           |                        |
| D. Not very sure of myself                           |                        |
| E. Not at all sure of myself                         |                        |



9. How often do you dislike yourself?
- A. Very often
  - B. Fairly often
  - C. Sometimes
  - D. Rarely
  - E. Never

\*Items selected from Berscheid, Walster, and Bohrnstedt Body Image Scale cited in Polivy (1977).

## APPENDIX E

### AWARENESS OF PHYSIOLOGICAL CHANGES QUESTIONNAIRE

APPENDIX E

AWARENESS OF PHYSIOLOGICAL CHANGES QUESTIONNAIRE

Please respond to the following statements using this scale.

| 0  | 1      | 2                      | 3                   | 4      |
|--|--------|------------------------|---------------------|--------|
| never  | rarely | about half<br>the time | most of<br>the time | always |
| 1. During sexual activity, I notice <u>vaginal lubrication</u> .   |        |                        |                     | _____  |
| 2. During sexual activity, I notice <u>nipple erection</u> .   |        |                        |                     | _____  |
| 3. During sexual activity, I notice <u>flushing on my chest</u> .  |        |                        |                     | _____  |
| 4. During sexual activity, I notice <u>my heart beating faster</u> .                                     |        |                        |                     | _____  |
| 5. During sexual activity, I notice <u>my breasts enlarging<br/>or swelling</u> .                        |        |                        |                     | _____  |
| 6. During sexual activity, I notice <u>muscle tension in my body</u> .                                   |        |                        |                     | _____  |
| 7. During sexual activity, I notice <u>warmth in my pelvic area</u> .                                    |        |                        |                     | _____  |
| 8. During sexual activity, I notice that I <u>breathe faster</u> .                                       |        |                        |                     | _____  |
| 9. During sexual activity, I notice that I have <u>less awareness<br/>of the environment around me</u> . |        |                        |                     | _____  |

APPENDIX F

SEXUAL AROUSABILITY INVENTORY

## APPENDIX F

### SEXUAL AROUSABILITY INVENTORY

#### INSTRUCTIONS

The experiences in this inventory may or may not be sexually arousing to you. There are no right or wrong answers. Read each item carefully, and then circle the number which indicates how sexually aroused you feel when you have the described experience, or how sexually aroused you think you would feel if you actually experienced it. Be sure to answer every item. If you aren't certain about an item, circle the number that seems about right. The meaning of the numbers is given below:

- 1 adversely affects arousal; unthinkable, repulsive, distracting
- 0 doesn't affect sexual arousal
- 1 possibly causes sexual arousal
- 2 sometimes causes sexual arousal; slightly arousing
- 3 usually causes sexual arousal; moderately arousing
- 4 almost always sexually arousing; very arousing
- 5 always causes sexual arousal; extremely arousing

#### ANSWER EVERY ITEM

How you feel or think  
you would feel if you were  
actually involved in this  
experience

- |  |                |
|--|----------------|
| 1. When a loved one stimulates your genitals with mouth and tongue   | -1 0 1 2 3 4 5 |
| 2. When a loved one fondles your breasts with his/her hand           | -1 0 1 2 3 4 5 |
| 3. When you see a loved one nude                                     | -1 0 1 2 3 4 5 |
| 4. When a loved one caresses you with his/her eyes                   | -1 0 1 2 3 4 5 |
| 5. When a loved one stimulates your genitals with his/her finger     | -1 0 1 2 3 4 5 |
| 6. When you are touched or kissed on the inner thighs by a loved one | -1 0 1 2 3 4 5 |
| 7. When you caress a loved one's genitals with your fingers          | -1 0 1 2 3 4 5 |
| 8. When you read a pornographic or "dirty" story                     | -1 0 1 2 3 4 5 |

|     |   |    |   |   |   |   |   |   |
|-----|---|----|---|---|---|---|---|---|
| 9.  | When a loved one undresses you  | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. | When you dance with a loved one                                       | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. | When you have intercourse with a loved one                            | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. | When a loved one touches or kisses your nipples                       | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. | When you caress a loved one (other than genitals)                     | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. | When you see pornographic pictures or slides                          | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 15. | When you lie in bed with a loved one                                  | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 16. | When a loved one kisses you passionately                              | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 17. | When you hear sounds of pleasure during sex                           | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 18. | When a loved one kisses you with an exploring tongue                  | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 19. | When you read suggestive or pornographic poetry                       | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 20. | When you see a strip show   | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 21. | When you stimulate your partner's genitals with your mouth and tongue | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 22. | When a loved one caresses you (other than genitals)                   | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 23. | When you see a pornographic movie (stag film)                         | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 24. | When you undress a loved one  | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 25. | When a loved one fondles your breasts with mouth and tongue           | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 26. | When you make love in a new or unusual place                          | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 27. | When you masturbate   | -1 | 0 | 1 | 2 | 3 | 4 | 5 |
| 28. | When your partner has an orgasm                                       | -1 | 0 | 1 | 2 | 3 | 4 | 5 |

APPENDIX G

TRANSCRIPT OF AUDIOTAPES

APPENDIX G  
TRANSCRIPT OF AUDIOTAPES

Transcript of Audiotape I (mildly seductive)

"You are so neat...

Ya, that's the way I feel.

In a day and age like this, there just aren't many people like you.

...At least I'm glad I found one of them.

I'd like to, I'd like to just forget about everyone else and stay here with you."

Transcript of Audiotape II (medium seductive)

"Have you got any idea of the way that you get to me?

You know I can't be near you for five minutes. I go right out of my mind.

I want to touch you all the time.

I just want to be near you, to feel you sitting next to me, to smell you sitting next to me.

On the street...just everywhere...

That's the way you, that's the way you hit me, that's the way you get to me.

Nobody else does it like that...not that way...not that strongly.

It's like animals, you know.

Doesn't that really make you feel the same way?

At least you, you act like it does.

Whether you feel it or not, I don't know, but if I can take your feelings from your actions, I know by the way you seem."



## APPENDIX H

### SUBJECTIVE RESPONSE FORMS

APPENDIX H  
SUBJECTIVE RESPONSE FORMS

I liked this film. \_\_\_\_\_

|                  |             |                         |          |           |
|------------------|-------------|-------------------------|----------|-----------|
| 0                | 1           | 2                       | 3        | 4         |
| Not<br>at<br>all | A<br>little | A<br>moderate<br>amount | A<br>lot | Extremely |

I felt tense during this film. \_\_\_\_\_

|                  |             |                         |          |           |
|------------------|-------------|-------------------------|----------|-----------|
| 0                | 1           | 2                       | 3        | 4         |
| Not<br>at<br>all | A<br>little | A<br>moderate<br>amount | A<br>lot | Extremely |

I felt sexually aroused during this film. \_\_\_\_\_

|                  |             |                         |          |           |
|------------------|-------------|-------------------------|----------|-----------|
| 0                | 1           | 2                       | 3        | 4         |
| Not<br>at<br>all | A<br>little | A<br>moderate<br>amount | A<br>lot | Extremely |

I felt offended during this film. \_\_\_\_\_

|                  |             |                         |          |           |
|------------------|-------------|-------------------------|----------|-----------|
| 0                | 1           | 2                       | 3        | 4         |
| Not<br>at<br>all | A<br>little | A<br>moderate<br>amount | A<br>lot | Extremely |

I felt embarrassed during this film. \_\_\_\_\_

|                  |             |                         |          |           |
|------------------|-------------|-------------------------|----------|-----------|
| 0                | 1           | 2                       | 3        | 4         |
| Not<br>at<br>all | A<br>little | A<br>moderate<br>amount | A<br>lot | Extremely |

I felt interested during this film. \_\_\_\_\_

|     |        |          |     |           |
|-----|--------|----------|-----|-----------|
| 0   | 1      | 2        | 3   | 4         |
| Not | A      | A        | A   | Extremely |
| at  | little | moderate | lot |           |
| all |        | amount   |     |           |

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