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PSYCHOLOGICAL, EMOTIONAL AND RELATIONSHIP CHANGES OF MEN AND WOMEN UNDERGOING AN INFERTILITY INVESTIGATION

By

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ABSTRACT

This preliminary, longitudinal study was conducted for the purpose of determining a) if changes occurred on the dependent measures of symptomatic psychological distress, marital adjustment, relationship quality, and sexual satisfaction for men and women who were undergoing the medical investigation of their fertility problems, b) at which point(s) during the investigation such changes occurred, c) the nature of these changes, and d) whether the changes were different for men and for women. The study also attempted to assess the impact of diagnostic information and time spent trying to conceive on the above-mentioned dependent measures. Forty-three couples were administered the SCL-90-R, the Index of Sexual Satisfaction, the Relationship Change Scale, and the Locke-Wallace Marital Adjustment Test, independently of their spouse, immediately following the initial medical visit, four weeks later during medical testing, immediately following diagnosis, and at six weeks post-diagnosis. The Life Experiences Survey and an experimenter-generated questionnaire regarding the psychological needs of infertile couples, were also administered during the final testing session. Results of the hypothesis testing indicated significantly higher psychological distress scores for both the men and women in the study at the time of the initial medical interview, with the female participants also reporting substantially higher

levels of symptomatic psychological distress at the time of diagnosis than the male participants. Receipt of positive, negative, or neutral diagnostic information did not serve to differentiate between the participants in terms of their levels of psychological distress. Higher psychological distress scores were observed for those participants who were identified as having an organic fertility problem as opposed to the men and women who were not identified as having an organic problem, although not at a significant level. Time spent trying to conceive prior to attending the clinic was not observed to be a factor which differentiated between the psychological distress levels of the participants during the infertility investigation. The sexual satisfaction levels and the marital adjustment of the participants were not significantly differentiated throughout the investigation on the basis of sex, diagnostic information, identified etiological source or time spent trying to conceive prior to attending the clinic, although participants did report positive changes in the overall quality of their relationships as they progressed through the infertility investigation. Considerably higher mean sexual dissatisfaction scores were observed, however, for the participants for whom a reason could not be found for their inability to conceive. The limitations of the study were discussed and the clinical and research implications were elaborated on.

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CHAPTER ONE

INTRODUCTION

The importance of fertility and a belief in the basic right of human beings to bear and rear children has been widely emphasized in most cultures of the world, and has endured as a central lifetime goal for many individuals from generation to generation. The value placed on the parental role in contributing to and facilitating normal adult development, has long been supported by the cultural, religious and social norms and teachings of most societies throughout the world (Denber, 1978; McBride, 1976; Pohlman, 1969; Veevers, 1980). From earliest times fertility has been worshiped and valued among human beings, with rituals and objects symbolizing fecundity being idolized. The myths of ancient Greece and Rome are replete with references to fertility in deference to goddesses like Venus, Artemis and Diana for their generativity (Menning, 1977; Pohlman, 1970). In the cultures of India, Mexico, Japan, Greece and Egypt phallic symbols and representations of the penis have been revered and worshiped for their reproductive symbolism (Menning, 1977; Pohlman, 1970), further emphasizing the enormous and pervasive value placed upon the reproductive function in these diverse cultures. Prior to the advent of reliable birth control parenthood was an inevitable outcome of sexual activity, and during the more agricultural time periods when the mortality rate was high and people were needed to work in the mines and to work the land, children

were considered to be an especially necessary resource and correspondingly, parenthood was considered to be a 'vital' social role (Pohlman, 1969; Veevers, 1980). In the Western world parenthood has almost universally been lauded as an inevitable and intrinsically desirable role (Pohlman, 1969), one aspired to by a large majority of adult men and women (Veevers, 1980).

Many religious doctrines have reinforced the connection between fertility and worthiness, by espousing the belief that procreation is a necessary criterion for marital fulfillment (Menning, 1977; Pohlman, 1970; Rosenfeld & Mitchell, 1979). Originating from the Judaeo-Christian tradition, children are viewed as heavenly blessings, while barrenness is considered to be a punishment for spiritual and/or moral transgressions (Pohlman, 1970). In the Book of Genesis (1:27, 28), Adam and Eve were commanded by God to "Be fruitful and multiply and replenish the earth"; a moral imperative seen to reassert itself in the Catholic doctrine of marriage, which contends that an intentionally childless marriage is not recognized in the eyes of God (Pohlman, 1969). Other religions permit a man to have many wives so that he may realize his procreative potential, and encourage him to relegate his wife to the level of servant if she is unable to bear his children (Menning, 1977; Pohlman, 1969; Wiehe, 1976a). Such religious indoctrination serves to further reinforce the relationship between an individual's fertility status and his or her worth and value as a person.

Members of the psychological community have also provided strong support for the notion that the parenthood role is a necessary component for normal adult development, especially in the case of the adult woman (Deutsch, 1945; Freud, 1905). Psychoanalytic theorist, Helena Deutsch (1945), espoused the belief that a woman develops her charm and beauty only after she has given birth, and that a woman who is unable to fulfill her reproductive function is to be considered neurotic and infantile. Deutsch (1945) suggests that female psychological adjustment rests upon the fulfillment of the motherhood role, with childbirth being supported as a necessary developmental task if a woman is to attain psychological maturity. The assumption, therefore, is that a woman who is unable to give birth is less than a fully developed, psychologically mature human being. From this perspective, a woman who does not or cannot reproduce will experience serious conflicts regarding her femininity (Benedek, 1952; Deutsch, 1945; Wortis, 1971), with unexplained female infertility postulated to be a defensive reaction against pregnancy and ultimately against femininity (Benedek, 1952; Deutsch, 1945; Menning, 1977; Wortis, 1971).

Central even to Erickson's (1950) more recent theory of human development, is the contention that all individuals have a desire to create, procreate, and/or generate. Failure to reproduce or progress through the developmental stage of 'generativity' constitutes a failure to achieve an im-

portant developmental goal, and is hypothesized to deny the individual progression to the final and most adult stage of 'ego integrity'. Although some researchers have begun to question the notion of reproduction as being critical to the attainment of full adult status and emotional development (McBride, 1976; Veevers, 1980), the important phases of a woman's life continue to be marked by events related to her reproductive functioning, from puberty through pregnancy, childbirth, childrearing and the 'empty nest syndrome' (Mazor, 1979; Sheehey, 1977). Even our conception of what constitutes maleness and femaleness in a sexual sense has long been equated with a man's ability to impregnate and with a woman's ability to bear a child.

A parenthood mystique has been supported over the centuries, which reasserts the belief that the reproductive function is a necessary criterion for personal fulfillment, social acceptance, religious membership, sexual identity and psychological adjustment (Pohlman, 1969; Veevers, 1980). Inability to fulfill the reproductive function has correspondingly been associated with psychological neuroses, sexual and personal inadequacy, and with a failure to achieve full adult status (Akhtar, 1978; Benedek, 1952; Gupta, Srivastava, & Verma, 1982; Kipper, Zegler-Shani, Serr, & Insler, 1977; Mai, Munday, & Rump, 1972a, 1972b; Singh & Neki, 1982). With such pervasive value being placed upon the reproductive function and with the relationship between fertility and both worthiness and psychological

health being reinforced over time, it is not surprising that achievement of the parenthood role continues to be regarded as a major life goal for many men and women, with fertility correspondingly being assumed to be a basic human right (Burgwyn, 1981; Menning, 1977; Pohlman, 1969).

Of those who attempt to become biological parents however, approximately one out of every six couples, or 17% of all couples who attempt to reproduce experience problems with their fertility, in terms of conceiving and/or carrying a pregnancy to term (Corson, 1983; Griffin, 1983; Kraft, Palombo, Mitchell, Dean, Myers, & Schmidt, 1980; Leader, Taylor, & Daniluk, 1984). Although it has been estimated that approximately 50% to 60% of all infertility problems can be successfully treated if the couple has access to expert medical care (Menning, 1980), the infertility experience itself may have a profound impact on the members of the couple (Seastrunk, Kemery, Adelsberg, McCaskill, & Bellina, 1984; Seibel & Taymor, 1982). Loss of control over such a highly valued human function, and the corresponding threat to an important life goal may overtax the existing resources of the individuals involved and may give rise to a period of emotional disequilibrium (Frank, 1984; McCormick, 1980; Menning, 1979, 1982; Seibel & Taymor, 1982; West, 1983). The infertility experience deals with the very essence of male and female sexuality and identity, and as such, may threaten a man's or woman's basic concept of their masculinity or femininity (Kaufman, 1969; Slade, 1981). The

resultant frustration, anxiety and stress often experienced by the infertile couple has been reported to adversely impact on their self-image (Platt, Fisher, & Silver, 1973), their self-esteem (Honea-Fleming, & Honea, 1984; Menning, 1977; Need, 1982), their psychological well-being (Bell, 1981; McCormick, 1980; Menning, 1982; Seastrunk *et al.*, 1984; Shapiro, 1982; Wilson, 1979), and their sexual satisfaction and sexual functioning (Bell, 1981; Debrovner & Shubin-Stein, 1975; Drake & Grunert, 1979; Elstein, 1975; Seastrunk *et al.*, 1984).

Within the context of a strong pronatalistic socialization, the inability to achieve such a highly valued and highly reinforced life goal may therefore leave an individual or couple questioning their relationship, their physical and psychological health, their worthiness, their value and their sense of sexual identity. It is one thing to choose to be childless, but it is quite different if the element of choice is removed and a couple is denied achievement of a highly valued, major life goal (Burgwyn, 1981; Menning, 1982). For those couples for whom the choice to become biological parents is temporarily or permanently removed, an emotional state may develop in response to this situation commonly referred to as the "crisis of infertility" (Allison, 1977; Goodman & Goodman, 1984; McCormick, 1980; Need, 1982; Seibel & Taymor, 1982; West, 1983).

In the past several years medical research has devoted

a considerable amount of effort and energy to the study of the physiological aspects of fertility and infertility, resulting in significant advancements in our understanding and technology related to human reproduction, with embryo transfers, artificial insemination by donors, and in vitro fertilization programs offering new hope for the infertile couple (Aitken, 1982; Chico & Hartley, 1981; Wiehe, 1976b). The emotional and psychological aspects of infertility have largely been ignored however (Rosenfeld & Mitchell, 1979), with the scant available literature in the area being fraught with methodological flaws and hampered by a lack of rigorous, scientific research procedures (Bell, 1981; Noyes & Chapnik, 1964; Wiehe, 1976a).

Of the few studies conducted in the past in the area of infertility, most have been retrospective attempts to determine the relationship between psychopathology in the female and infertility (Karahasanoglu, Barglow & Growe, 1972; Mai *et al.*, 1972a; Platt *et al.*, 1973), and have failed to take into account both the male partner in the couple and the incredible stress and emotional strain that the experience and treatment of infertility may place on a couple (Bell, 1981; Seibel & Taymor, 1982). Researchers have not attempted to determine whether the psychological distress experienced by infertile individuals precedes or follows the diagnosis of their reproductive failure. Other flaws common to research in the area of infertility include a lack of information regarding the point(s) during the

infertility investigation at which psychological assessments are made, the use of unstandardized measures, and vaguely stated hypotheses and questionable materials and methods which have resulted in weak and often unjustifiable and indefensible conclusions regarding the mental health of the infertile individual (Bell, 1981; Noyes & Chapnik, 1964; Seibel & Taymor, 1982).

Following a concise review of the literature published between the years 1935 to 1963 on the psychological aspects of infertility, Noyes and Chapnik (1964) emphasized the vagueness of the research in this area, and reported that most of these scanty, retrospective, poorly organized and poorly analyzed studies could "support almost any preconceived opinion" (p. 553). In concluding their analysis, these authors called for the development of new diagnostic and therapeutic methods, and for the undertaking of more extensive, objective and scientifically rigorous studies in the area of infertility. Although more recent studies have attempted to overcome some of these difficulties (Allison, 1977; Baker & Quinkert, 1983; Brand, 1982, Brand, Ross, & van der Merwe, 1982; Feuer, 1983; Slade, 1981; Shapiro, 1982; Weltzien, 1983; Wilson, 1979), this challenge remains to be met, if medical and psychological support services in the area of infertility are to be directed towards meeting the specific needs of the infertile individual and couple.

Many individuals and researchers have emphasized the

negative impact that infertility may have on the lives of the couples involved in this experiences, and have attempted to provide psychological support services for couples experiencing difficulty with their fertility (Abarbanel & Bach, 1959; Berger, 1977; Bresnick & Taymor, 1979; Farrer-Meschan, 1971; Frank, 1984; Goodman & Goodman, 1984; Menning, 1982; Rosenfeld & Mitchell, 1979; Rutledge, 1979; Shrednick, 1983; Walker, 1978; Wilchins & Park, 1974). However, systematic research to determine the specific psychological and emotional needs of the infertile individual and couple is still sorely lacking. As a result of this dearth in experimental research on the emotional impact of infertility, the prevalence, severity and duration of emotional distress experienced by the men and women undergoing a medical investigation for their infertility remains to be determined. Without such knowledge, the development and implementation of psychological intervention programs to meet the needs of those infertile men and women requiring assistance cannot be adequately accomplished. The present study has been designed for the precise purpose of obtaining this necessary preliminary information.

The study will attempt to determine a) if changes occur on the dependent measures of symptomatic psychological distress, marital adjustment, relationship change, and sexual satisfaction for couples who are undergoing medical investigation of their infertility, b) at which point(s) during investigation such changes occur, and c) whether

these changes are different for men and for women. The impact of positive diagnostic information (availability of treatment), negative diagnostic information (no treatment available), and more neutral diagnostic information (no treatment warranted), on the above-mentioned dependent measures for men and women who receive this information will also be assessed. The research will further attempt to explore the relationship between changes on the dependent measures and both the amount of time participants have been trying to conceive prior to attending the fertility clinic, and the diagnostic information received by the couples regarding the male, female, or combined etiology of their fertility problem.

Results of the study may serve to provide medical and mental health practitioners working in the area of reproduction with the information they require a) regarding the psychological and relationship changes of infertile men and women during the infertility investigation, b) the need for, focus and timing of psychological interventions with infertile individuals, and c) the impact of diagnostic information on the stress levels and relationships of couples experiencing difficulty with their fertility. Ultimately the information gained from the study may be later utilized as a basis for the development of intervention programs to assist infertile individuals in adequately coping with and resolving issues related to their fertility status. The results may also serve to provide support for

a more interdisciplinary approach to the investigation and treatment of infertile couples.

Definition of Terms

For the purpose of the present research the following definitions will be utilized:

Infertile Couple: defined by the American Fertility Society as one that has not achieved a successful pregnancy after a year of having regular intercourse (2 to 3 times each week), without the use of contraception.

Primary Infertile Couple: a couple in which the woman has never achieved a successful pregnancy.

Secondary Infertile Couple: a couple in which the woman has achieved a successful pregnancy and delivery in the past.

Artificial Insemination Donor (A.I.D.): medical insemination of the female member of a couple with the semen of a male donor.

In Vitro Fertilization: implantation of the fertilized ovum of a female and her male partner into the uterus of the woman, following conception in a laboratory setting.

CHAPTER TWO

REVIEW OF THE LITERATURE

The literature to be reviewed in this chapter will include the relevant research regarding the influence of psychological factors on fertility, and the literature related to the emotional, psychological and relationship impact of the infertility experience. The review will assist in providing the reader with an understanding of the problems commonly associated with the infertility experience, and will serve to substantiate the need for more well-focused, and empirically sound research within this increasingly complex and controversial area of human study.

Influence of Psychological Factors on Fertility

Over the past several years the majority of psychological research conducted in the area of infertility represents attempts to examine and/or support the contention that a causal relationship exists between psychopathology and infertility (Allison, 1977; Decker, 1972; Freeman, Garcia, & Rickels, 1983; Gupta *et al.*, 1982; Magner, 1981; O'Moore, Carruthers, Harrison, Murphy, & O'Moore, 1983; Richardson, 1972; Rutherford, 1965; Seward, Wagner, Heinrich, Bloch, & Myerhoff, 1965; Singh & Neki, 1982). Such a contention has been derived from the fact that "as recently as 18 years ago, 40% to 50% of infertility cases were thought to be caused by emotional factors" (Seibel & Taymor,

1982, p. 137), due to a lack of evidence linking infertility in these cases to any 'known' organic cause. Commonly referred to as 'normal infertility' (Menning, 1977), couples for whom no apparent physiological basis could be found for their inability to conceive and/or carry a pregnancy to term, were assumed, therefore, to have a psychological etiology to their problem (Christie, 1980; Decker, 1972; Denber, 1978; Rommer & Rommer, 1958). Predominant psychoanalytic views regarding the emotional origins of female infertility (Benedek, 1952; Deutsch, 1945) served to further support the 'psychogenic infertility' hypothesis, as did the commonly held but erroneous belief that adoption is often followed by a normal pregnancy for many previously infertile couples (Arronet, Bergquist, & Parekh, 1974; Rock, Tietze, & McLaughlin, 1965).

Primary emphasis in researching the impact of psychological factors on fertility has been placed on the female member of the couple, with the psychological health of the 'normal infertile' woman frequently being called into question (Allison, 1977; Eisner, 1963; Freeman *et al.*, 1983; Karahasanoglu *et al.*, 1972; Kipper *et al.*, 1977; Kistner, 1973; Magner, 1981; Richardson, 1972). Such a focus on the female has occurred despite the fact that 35% to 40% of all infertility problems can be attributed to the male partner in the couple (Leader *et al.*, 1984).

An example of the research conducted in the past in this area is a study by Eisner (1963) which attempted to

assess the presence of psychological disturbance in 28 infertile women having no diagnosed gynecological abnormalities and whose husband's sperm was considered adequate for impregnation or was supplemented by 'donor semen'. A "similar number of women who had demonstrated no difficulty in conceiving and bearing children served as controls" (p. 392). While acknowledging that infertility and its treatment invariably produces considerable pain, tension, anxiety and marital difficulties, Eisner provides no information regarding the duration of the subjects' infertility, the period of unsuccessful treatment undergone prior to testing, and/or the stage at which testing was conducted for the experimental subjects and the controls. On the basis of Rorschach protocols judged by 5 "blind" judges and 4 additional judges who "used their experience and intuition" (p. 392) to assess the presence and quality of emotional disturbance, the infertile women in the study were found to give significantly more abnormal Rorschach responses than did their multiparous counterparts. Eisner attributed the "schizophrenic-like maladjustment" (p. 294) of these infertile women to an inner conflict over their femininity while concurrently concluding that infertility is both an emotionally disturbing condition and that emotional disturbance may well be a causative factor in infertility. Methodological flaws, inadequate sample and control group composition, and instrument deficiencies may well have resulted in the drawing of unjustified and highly

questionable inferences regarding the mental health of the infertile female.

Another example of the type and quality of research conducted in the past in the area of infertility is an even more recent and often quoted study by Mai, Munday and Rump (1972a). In this study, 50 infertile wives and 35 of their husbands were compared with 50 fertile wives and 15 of their husbands on various dimensions of psychiatric pathology, psychosexual orientation disturbance, and personality disorders, through the use of a semi-structured psychiatric interview. The interviewer apparently made a conscious attempt to remain 'impartial and uninfluenced' by any desire to prove the hypotheses under investigation, despite having knowledge of who the experimental and control subjects were. In reporting their findings, the researchers claimed that, while there was no evidence of "any generally greater neuroticism or psychoticism in the infertile group" (p. 438), significantly more of the infertile women were diagnosed as having hysterical or aggressive personality disorders and the infertile females also appeared to show greater disturbances in their psychosexual orientation and behavior. Despite highly apparent methodological flaws and the admitted difficulty on the part of the researchers in stating whether these apparent changes preceded or followed the subjects' infertility, the psychological and psychosexual adjustment of the infertile female was again called into question.

Such findings as these have resulted in questions being posed regarding the emotional maturity of the infertile female (Sandler, 1968), the neurotic aspects of the infertile woman's personality which "cause her to reject her femininity" (Rommer & Rommer, 1958, p. 320), the psychologically unhealthy relationship of the infertile female with her mother (Ford, Forman, Wilson, Char, Nixon, & Scholz, 1953; Mozley, 1976; Rubenstein, 1951; Rutherford, 1965), the "maturity of the couple's marriage (and) motivation for pregnancy" (Rutherford, 1965), and the role played by unrealistic fears and anxieties in the etiology of a couple's infertility (Sturgis, Taymor, & Morris, 1957).

While little literature has been published regarding possible psychosomatic factors which influence the reproductive functioning in the male (de Watteville, 1957; Rutledge, 1979), psychosexual maladjustments in the form of impotence, incomplete erection, ejaculatory incompetence and oligospermia have primarily been emphasized as psychologically linked causal factors in cases of infertility (Debrovner & Shubin-Stein, 1975; Elstein, 1975; Menning, 1980; Seibel & Taymor, 1982; Walker, 1978). Debrovner and Shubin-Stein (1975) suggest psychogenic etiology in the case of the male who generally has experienced no sexual performance problems, but who becomes impotent during his wife's fertile period, or who manages to consistently avoid intercourse during this period for supposed reasons of

health, job or travel. Elstein (1975) refers to various male and female psychosexual problems which may masquerade as cases of infertility, and Seibel and Taymor (1982) suggest that up to 10% of the cases of infertility may be explained on the basis of male sexual dysfunction.

From a psychoanalytic perspective, it has been postulated that "anxiety and guilt become pathologic in a healthy man if he had prior unresolved conflicts with regard to his sexual role" (Denber, 1978, p. 26). Studies conducted and reported by Rutledge (1979) suggest that the personalities of infertile males show "compulsive and hysterical traits with emphasis on the oral and phallic aspects of sexual behavior" (p. 256). According to Rutledge (1979) there is an interdependent relationship between emotional life and the autonomic and hormonal functioning in humans, with "stress from unresolved intrapsychic and interpersonal conflicts" (p. 257) producing individual infertility. Statements such as these serve to again call into question the psychological well-being of the infertile individual, and in particular, the psychosexual functioning of the infertile male. Such a relationship between psychological and physiological processes continues to be inferred (Magner, 1981; O'Moore *et al.*, 1982; Richardson, 1972), in spite of the fact that the complexities of neuroendocrinology are only beginning to be understood and there is no evidence as yet to support such a causal relationship (Christie, 1980; Decker, 1972;

Karahasanoglu *et al.*, 1972; Leader *et al.*, 1984; Seibel & Taymor, 1982).

While some studies have claimed to find evidence of high levels of anxiety (Mai *et al.*, 1972a; O'Moore *et al.*, 1983; Platt *et al.*, 1973); neuroticism (Platt *et al.*, 1973; Rutherford, 1965; Sandler, 1968; Sturgis *et al.*, 1957); feminine role distortion (Kipper *et al.*, 1977); and emotional disturbance (Eisner, 1963; Mai *et al.*, 1972b; Platt *et al.*, 1973; Rutherford, 1965) in the infertile population, most of these retrospective studies are fraught with methodological flaws related to inadequate sample and control group size and composition, potential experimenter bias, and procedural deficiencies such as the use of questionable designs, measurement and instrumentation. Many studies have failed to take into account the stress that the infertility experience itself places on the couple and have concluded that causal relationships exist between psychopathology and infertility, solely on the basis of anecdotal reports and cross-sectional data.

Other studies have not been successful in showing any evidence of a causal link between psychogenic factors and the occurrence of infertility (Brand, 1982; Decker, 1972; Denber & Roland, 1969; Freeman *et al.*, 1983; Noyes & Chapnik, 1964; Seibel & Taymor, 1982; Seward *et al.*, 1965; Taymor & Bresnick, 1978). While efforts continue to be made to examine the relationship between psychopathology and infertility, to date, studies have been unsuccessful

in citing specific instances where a definite cause and effect relationship existed between psychological factors and a physiologic change that delayed or prevented pregnancy. Studies focusing on the psychological and emotional factors which may be causally associated with infertility have resulted in conflicting data and have provided no conclusive evidence to support the contention that specific psychological factors can alter fertility, or are operative in cases where a medical etiology cannot be found (Denber, 1978; Denber & Roland, 1969; Noyes & Chapnik, 1964; Rosenfeld & Mitchell, 1979). In "virtually all of this research . . . it is impossible to determine whether . . . personality factors are a cause or the result of the infertility as no prospective studies are reported" (McGuire, 1975, p. 175).

In fact, recent increases in our understanding of neuroendocrinology have reduced the potential relationship between psychological and emotional factors as a cause of infertility, and as the state of the diagnostic art has improved there has been a corresponding decrease in the number of couples who are diagnosed as being 'normal infertile' (Leader *et al.*, 1984; Menning, 1982; Seibel & Taymor, 1982). At the present time there remains an estimated 5% to 10% of all infertility cases, for which no organic cause can be found (Seibel & Taymor, 1982). The intricate influence of emotions and attitudes on endocrine functioning and the complex countereffects

of chemical secretions on mental and emotional states is just beginning to be understood (Rutledge, 1979; Seibel & Taymor, 1982). With further advancements in this area, the question of the relationship between psychological factors and infertility may soon be answered, and valuable information may be provided regarding the etiology and treatment of what is now referred to as 'normal infertility' (Denber, 1978; Seibel & Taymor, 1982).

In the meantime, however, the impact of such an emphasis on psychological abnormality for the couple who have no known organic cause for their infertility may be quite destructive (Decker, 1972; Denber & Roland, 1969; Menning, 1982). It "can be harmful to assume that the absence of a known organic cause means that psychological factors are dominant" (McGuire, 1975, p. 147). Such unsubstantiated speculation regarding the mental health of the infertile individual or couple may only serve to alienate these individuals from their medical and personal support systems at a time when such support and validation may be most critical. "It appears most likely that emotional problems . . . are more often a result of, rather than a cause of, infertility" (Seibel & Taymor, 1982, p. 138), and as such, that the mental health professions may better serve the needs of the infertile individual and couple by attending to the emotional and psychological sequelae of the infertility experience.

Impact of Infertility

Based upon the work of Lazarus and his colleagues (Lazarus, 1980; Coyne & Lazarus, 1980), stress has been conceptualized in terms of the resulting interaction between the person and his or her environmental demands, which exceeds or taxes the individual's resources (Coyne & Holroyd, 1982). Within this definitional framework, the experience of infertility and the invasive medical investigation of an individual's reproductive capacity may well constitute an environmental demand which transcends the level and degree of resources available to many men and women. Such stress may be manifested in the intrapersonal and interpersonal lives of the infertile individual and couple.

In the past several years, there has been a growing recognition of the emotional and psychological impact which may be evoked by the experience of infertility (Aitken, 1982; Bresnick, 1981; Bresnick & Taymor, 1979; Frank, 1984; Menning, 1982; Wilson, 1979). Most of the literature in this area, however, is based upon static observational data and anecdotal case reports. Few research studies have attempted to experimentally assess and verify the extent, severity and duration of couples' reactions to the infertility experience, thereby resulting in literature largely based on speculation and conjecture. Despite these deficiencies, an examination of this literature will assist in identifying the range of problems which may be associated with the infertility experience, and will provide a basis

for the selection of the specific dependent variables being examined in the present study.

Infertility poses a serious threat to the attainment of what is for many individuals a major life goal. As such, the infertility experience may place considerable stress on a couple's physical, social and psychological well-being, in presenting what appears to be a problem insoluble in the immediate future. Attempting to cope with their fertility status may overtax a couple's existing resources (Frank, 1984; Need, 1982; Seibel & Taymor, 1982), and may well present a situation which is impervious to a couple's normal coping abilities and strategies. For those who find themselves unable to deal effectively with the repercussions of their infertility, a period of emotional disequilibrium may ensue, commonly referred to as the "crisis of infertility" (Bresnick, 1981; Menning, 1982; Rosenfeld & Mitchell, 1979; Seibel & Taymor, 1982; West, 1983; Wilson, 1979).

An important aspect of the 'crisis of infertility' is the overwhelming sense of helplessness and desperation which may be experienced by a couple in response to their loss of control over such a highly valued life event (Armstrong, 1982; Frank, 1984; Mazor, 1979; McCormick, 1980; Need, 1982). For couples who have delayed parenthood through the lengthy and often cumbersome use of contraceptives, facing the reality of their reproductive status can leave them feeling deceived and betrayed (Bresnick, 1981; Menning, 1982). For individuals who questioned their desire

to become parents, or who postponed pregnancy until their careers, relationships and homes were secured, the prospect of not being able to have their family when they had planned and hoped for may be particularly distressing. Most men and women approach adulthood believing in their basic right to bear and rear children. The realization that fertility is not under the individual's control may be a devastating reality and may leave a man or woman questioning his/her efficacy in other important areas of life.

Common reactions to the infertility experience reportedly parallel the 'stages of dying' postulated by Kubler-Ross (1969), ranging from the initial feelings of surprise and denial and progressing through various stages of isolation, anger, guilt, unworthiness, depression and grief (Daniels, Gunby, Legge, Williams, & Wynn-Williams, 1984; Hertz, 1982; Menning, 1977, 1979; Shapiro, 1982; Taymor & Bresnick, 1978). In effect, the infertile couple experience potential and/or actual loss on several levels: the loss of a life goal, the loss of the pregnancy experience, the loss of their fertility and the loss of their potential biological children (Menning, 1982; Need, 1982). The infertile couple may grieve over the loss of control over their life plans and future fulfillments, their perceived loss of integrity, the loss of their ideal self-image, the loss of their image of being competent sexual beings, and the loss of their sense of positive self-esteem (Bresnick, 1981; Griffin, 1983; Kraft *et al.*, 1980; Shapiro, 1982; Wilson,

1979). Regardless of the cause of their infertility, infertile men and women are reported to feel 'damaged' and 'defective', and to experience a marked sense of personal failure over their inability to produce a child (Sawatzky, 1981; Seibel & Taymor, 1982).

The outward signs of the infertility crisis have been reported to involve dramatic increases in tension and anxiety, which may be manifested in depressive symptomatology, hostility, agitation and interpersonal sensitivity (Berger, 1977; Feuer, 1983; Griffin, 1983; Kraft *et al.*, 1980; Rosenfeld & Mitchell, 1979; Seibel & Taymor, 1982; Taymor & Bresnick, 1978; Wilson, 1979). Physical and somatic manifestations of this reproductive depression have been reported to include tension headaches, upset stomaches, disruption in sleeping and eating patterns, exhaustion, and choking or tightness in the throat (Menning, 1982; Shapiro, 1982), as well as various stress-related reproductive disorders such as impotence, dysmenorrhea and amenorrhea (Seibel & Taymor, 1982; Shapiro, 1982).

According to a recent study of the psychological factors associated with infertility, infertile females scored significantly higher than infertile males on the Beck Depression Inventory, with the degree of depression being positively related to the amount of time an individual had spent in treatment (Weltzien, 1983). Depression was also reportedly experienced by 83% of the 53 infertile couples evaluated in a recent study by Seastrunk and his associates

(Seastrunk *et al.*, 1984). Feuer (1983) found that infertile males scored high on the Beck Depression Inventory, both at the time of diagnosis and at the post-diagnosis time period, when they and their partners had either ceased trying to conceive or were continuing with their attempts at conception. Unfortunately, in each of these cross-sectional studies, it is impossible to determine whether the reportedly high levels of depression experienced by infertile men and women were maintained throughout the course of the investigation and treatment, or whether the subjects experienced transitory bouts of depression corresponding to particular phases of the infertility investigation and treatment.

On an intrapersonal level, the infertility experience may leave an individual at least temporarily ravaged in terms of his/her self-image, self-esteem and sexual identity (Feuer, 1984; Kraft *et al.*, 1980; Shapiro, 1982; Taymor & Bresnick, 1978). The "reality of infertility encompasses feelings of self-worth and body image. Feelings of bodily defectiveness, loss of sexual attractiveness, and social unworthiness often accompany diagnosis" (Rosenfeld & Mitchell, 1979, p. 178). For the infertile male, the experience of infertility may be perceived as a blow to the man's virility, masculinity and male self-image (Debrovner & Shubin-Stein, 1975; Feuer, 1984; Kraft *et al.*, 1980). For the infertile female, the inability to produce a child may be perceived as an inability to fulfill her biological role (Bresnick, 1981; Menning, 1982).

The infertility experience is often accompanied by a strong tendency towards self-blame, with intense guilt and shame over past perceived transgressions being experienced by one or both members of the infertile couple (Honea-Fleming & Honea, 1984; Griffin, 1983; Menning, 1982; Shapiro, 1982; Wilson, 1979). Such guilt-ladened past events often include premarital sexual experiences, previous abortions, the use of birth control, a previous pregnancy where a child was surrendered for adoption, venereal disease, extramarital sex or interest, masturbation, homosexual thoughts or acts and sexual pleasure itself (Griffin, 1983; Menning, 1982). Individuals with an already poor self-image or with strong religious convictions may well feel that they have in effect caused their infertility, due to their unworthiness, and may put themselves through even greater stress in attempting to atone for their supposed misdeeds (Aitken, 1982; Griffin, 1983; Menning, 1977, 1982).

The infertility experience challenges our basic assumptions regarding male and female sexuality, and may leave an individual questioning and having to redefine his or her conception of sexuality and sexual identity (Barnes, 1979; Kipper *et al.*. 1977; Kraft *et al.*, 1980; Platt *et al.*, 1973; Wiehe, 1976a). For those who strongly believe in the inevitability of children in a marriage, failure to conceive or carry a pregnancy to term may be associated with a failure to validate one's marital relationship (Seibel & Taymor, 1982). The prospect of being unable to reproduce and the

realization of one's loss of control over such an important area of life fulfillment may also reawaken unresolved conflicts and past problems, thereby compounding the depth of the 'infertility crisis' and the degree of difficulty experienced by an individual in coming to terms with his or her fertility status (Menning, 1980; Rosenfeld & Mitchell, 1979; Wiehe, 1976b). Whatever the emotional state of a couple may be prior to dealing with this crisis, the physical and psychological stress which is concomitant with the infertility experience may exacerbate or re-activate any existing biological, emotional or social conflicts, thereby adding to the trauma of the couple's present difficulty (Bresnick, 1981; Taymor & Bresnick, 1978).

On an interpersonal level, the emotionally charged infertility experience may be seen to impact on many aspects of a couple's marriage and quality of life together (Kaufman, 1969; Seastrunk *et al.*, 1984; Shapiro, 1982; Taymor & Bresnick, 1978), with common areas of difficulty reportedly arising in terms of communication breakdown, sexual dissatisfaction, and both psychological and physical withdrawal and isolation (Berger, 1980; Bresnick, 1981; Bresnick & Taymor, 1979; Debrovner & Shubin-Stein, 1975; Kaufman, 1969; Walker, 1978). Infertility may place great stress on the couple, with the stability and future of their marriage itself being brought into question (Aitken, 1982; Farrer-Meschan, 1971). In a recent study, 45% of couples undergoing extensive physical treatment for their infertility

reported experiencing increased difficulty in living harmoniously with their spouse (Seastrunk *et al.*, 1984). In another study, the marital interaction scores of 46 infertile females whose husbands refused to participate in the research study, compared with the divorced norms of the Dyadic Adjustment Scale, while the scores obtained by the 85 women whose husbands voluntarily agreed to participate in the study in question compared favorably with the married norms, again calling into question the state of some infertile marriages prior to and following the infertility diagnosis (Weltzien, 1983). While some literature suggests that the couple may draw closer together as a result of their experience with infertility (Armstrong, 1982; Mazor, 1979; Menning, 1977; Shapiro, 1982), based on her experience in providing psychological services to infertile individuals and couples, Bresnick (1981) acknowledges the negative impact which the experience of infertility may have on the marital relationships of infertile couples, and denotes specific difficulties arising in the areas of communication, sexual activity and future planning. Whether the infertility investigation and treatment exacerbates already existent marital difficulties or whether marital distress is a result of the infertility investigation and treatment remains to be determined. The general prevalence of marital difficulties among infertile couples also remains uncertain.

If the etiology of the infertility problem is identified

as being a female factor, the woman in the relationship may feel that she is incomplete, without a sexual identity and/or is a failure as a woman (Farrer-Meschan, 1971; Menning, 1982). If the etiology is diagnosed as being a male factor, the male member of the couple may find his sexual self-image and sense of masculinity and virility coming into question (Debrovner & Shubin-Stein, 1975; Farrer-Meschan, 1971; Menning, 1982). The partner whose reproductive capacity is not in question may also find himself or herself questioning the sexuality, desirability and worthiness of his or her spouse (Menning, 1977). Both members of the couple may find themselves unable to communicate and provide support to one another at a time when such interaction is critical, and the marital balance as such may be seriously upset at this time of personal crisis (Farrer-Meschan, 1971; Feuer, 1983; Klemer *et al.*, 1966; Rutledge, 1979; Shapiro, 1982; Weltzien, 1983). The inability to have children within a relationship may threaten the concept of what constitutes a marriage for some individuals, and may leave a couple questioning the very purpose of their union (Kraft *et al.*, 1980).

The couple may feel extremely isolated and alone with their infertility problem; feelings which are often intensified by social contacts that frequently involve friends and family members who themselves are in various stages of the parenting role (Feuer, 1983; Griffin, 1983; Rosenfeld & Mitchell, 1979; Taymor & Bresnick, 1978). Such well-intentioned social contacts often attempt to placate the

infertile individual by proffering advice regarding the appropriate techniques to ensure procreation, and/or by reiterating stories regarding the occurrence of pregnancy following either adoption or a relaxing holiday. Unfortunately, such misdirected support often leaves the infertile individual feeling even less competent, and again calls into question the impact of the couple's mental health status on their fertility. With a heightened sense of inadequacy and failure, the couple may withdraw from family-oriented encounters as a defense against the recognition of their personal inability to produce a child (Aitken, 1982), thereby cutting themselves off from any outside support at a time when such support and understanding may be most advantageous (Bresnick, 1981; Feuer, 1983; Griffin, 1983; Klemer, *et al.*, 1966; Menning, 1977; Taymor & Bresnick, 1978).

One of the other areas reported to be most predominantly affected by the infertility experience and the corresponding medical work-up is the sexual life of the couple (Berger, 1980; Debrovner & Shubin-Stein, 1975, 1976; Drake & Grunert, 1979; Seastrunk *et al.*, 1984). The inability to produce a child may challenge the way in which an infertile individual perceives himself or herself as a sexual being, and may result in the loss of sexual self-esteem and the occurrence of sexual dissatisfaction and sexual difficulties (Debrovner & Shubin-Stein, 1975; Need, 1982; Seibel & Taymor, 1982). The infertility investigation itself places a great deal of emphasis on a couple's sexual relationship, in an attempt to

determine if common psychosexual problems such as vaginismus, impotence or ejaculatory incompetence are related to the couple's inability to conceive (Debrovner & Shubin-Stein, 1975; Drake & Grunert, 1979; Elstein, 1975; Leader *et al.*, 1984; Seibel & Taymor, 1982; Walker, 1978). "As well as causing infertility, sexual dysfunction may result from the work-up and treatment procedures" (Walker, 1978, p. 484), during which time the sexual act is often reduced to a planned and rigid schedule guided by a thermometer. Continual monitoring of the woman's basal body temperature serves to maintain a constant focus on the couple's infertility, and may result in a pattern of mid-cycle intercourse, after which sex is abandoned until the following month during the designated fertile period (Menning, 1977; Need, 1982; Seibel & Taymor, 1982; Walker, 1978). This goal-directed emphasis on 'making babies' as opposed to 'making love', has been reported to lead to performance anxiety, stress, and conflicts over sex, resulting in decreased spontaneity and frequency of coitus and in an increased incidence of mid-cycle male impotence (Berger, 1980; Drake & Grunert, 1979; Rosenfeld & Mitchell, 1979; Seibel & Taymor, 1982; Walker, 1978).

The menstrual cycle may become a vicious cycle, resulting in loss of sexual interest, vaginismus, a decreased capacity for orgasm, transitory bouts of impotence and/or ejaculatory failure, and various other forms of sexual difficulties (Debrovner & Shubin-Stein, 1975; Elstein,

1975; Seibel & Taymor, 1982; Walker, 1978). Couples undergoing an infertility investigation are frequently required to carry out procedures such as masturbation and post-coital testing, during which time they must perform sexually so that a third party can medically inspect and evaluate the results of their efforts (Menning, 1977; Walker, 1978). The privacy which is usually accorded to the sexual relationship and functioning of a couple must be relinquished during the infertility investigation, thereby leaving the members of many infertile couples feeling dehumanized, victimized and exposed (Bresnick, 1981; Debrovner & Shubin-Stein, 1975; Seibel & Taymor, 1982; Taymor & Bresnick, 1978).

Combined with the anxiety and frustration already experienced by an infertile couple, it should come as no surprise that medical interference of such a nature may well result in the occurrence of sexual dissatisfaction (Bell, 1981; Seibel & Taymor, 1982). In a recent study of 53 infertility cases, 42% of the couples who were undergoing extensive treatment reported experiencing difficulty in the sexual realm (Seastrunk *et al.*, 1984). In a study of 51 infertile couples, Drake and Grunert (1979) identified the shift in purpose from pleasure to conception, and the fear of failure on the part of the male of being unable to perform on the 'right night', as the primary reasons for the common occurrence of mid-cycle sexual problems in infertile marriages. Bouts of impotence

following the discovery of azoospermia have also been reported to occur in 63% of the 16 infertile males studied by Berger (1980). Loss of sexual desire and/or problems of sexual dysfunction appear to occur with some frequency among infertile couples, with such difficulties only serving to contribute to the stress which is already being placed on the relationship of the couple and posing a further threat to the sexual self-esteem of the individuals involved in this experience. Such stress in the sexual realm may compound the sense of undesirability and ineffectiveness already being experienced by many infertile men and women (Bresnick, 1981; Mazor, 1979; Menning, 1977, 1982).

The stress of infertility may be further accentuated by the intrusive nature of the infertility investigation and medical treatment procedures, which are often humiliating, embarrassing, time consuming, painful and sometimes expensive (Berger, 1977; Bresnick, 1981; Rosenfeld & Mitchell, 1979; Seibel & Taymor, 1982; Walker, 1978). Certain procedures required for the evaluation and treatment of infertility, such as genital examinations, laparoscopy, hysteroscopy, masturbation, artificial insemination, basal body temperature readings and reconstructive tubal surgery, may be both physically and emotionally exhausting and threatening, and may add considerably to the couple's already elevated level of stress (Bresnick, 1981; Menning, 1982; Walker, 1978). Infertility treatment is fraught with unavoidable stresses and by the time a couple seeks medical

attention for their infertility they may have spent months or even years attempting to conceive and they may, therefore, already be in a state of crisis (Aitken, 1982; Mazor, 1979). As such, the frustration and anxiety already experienced by the infertile couple may be enhanced through the intrusive nature of the fertility work-up, thereby compounding the couple's sense of helplessness and loss of personal control (Mazor, 1979; McCormick, 1980).

The infertile couple is in a kind of 'suspended animation' when undergoing the investigation and treatment of their infertility (McGuire, 1975; Rosenfeld & Mitchell, 1979). According to McGuire (1975), extensive investigations and/or treatment tends to exclusively focus the couple's attention on their fertility problem. During this time the couple often put aside the resolution of their fertility crisis by postponing a confrontation with their childlessness and by avoiding dealing with important life decisions. According to Debrovner and Shubin-Stein (1975b) "the longer the couple remains infertile the more likely they are to develop secondary psychological problems" (p. 161). Weltzien (1983) also found a trend toward a higher incidence of depression as time-in-treatment continues.

Further compounding the stress of the infertility work-up is the fear which often accompanies the infertility investigation. None of the treatments presently available guarantee a successful pregnancy, and although the infertile couple wants to find answers to explain their inability

to produce a child, they also fear the discovery of an etiology which is not treatable or which has little hope of a successful outcome (Rosenfeld & Mitchell, 1979; Steigrad, 1982). Such a discovery may result in the placement of guilt or blame on the partner who is infertile, and/or may create feelings of finality and hopelessness with which the couple is unable to deal (Menning, 1980; Rosenfeld & Mitchell, 1979). With the delivery of a diagnosis, couples may be required to make decisions regarding lengthy treatment or alternative courses of action such as A.I.D. or in-vitro fertilization; decisions which place new strains on the couple's relationship at a time when their emotional strength and energy may be at its lowest ebb (Farrer-Meschan, 1971; Menning, 1977).

While the intensity of an individual's reaction to the experience of infertility may depend on the person's personality structure, discrete vulnerabilities (Kraft *et al.*, 1980), and characteristic means of dealing with loss and disappointment (Frank, 1984; Mazor, 1979; McGuire, 1975), the literature would appear to support the contention that the infertility experience may be a particularly unexpected and stressful event in the lives of a man and woman. The loss of control over such a highly valued human function and the corresponding threat to the attainment of what is for many individuals an important life goal, reportedly impacts on all aspects of the infertile individual's intrapersonal and interpersonal life, with

particular areas of difficulty reported to include symptomatic psychological distress (Bell, 1981; Bresnick, 1981; Bresnick & Taymor, 1979; Seastrunk *et al.*, 1984; Seibel & Taymor, 1982), marital turbulation (Farrer-Meschan, 1971; Klemer *et al.*, 1966; Seastrunk *et al.*, 1984; Shapiro, 1982; Weltzien, 1983), and sexual dissatisfaction and/or dysfunction (Bell, 1981; Debrovner & Shubin-Stein, 1975; Drake & Grunert, 1979; Elstein, 1975; Seastrunk *et al.*, 1984). Moreover, the often lengthy diagnostic investigation and treatment of infertility may further exacerbate the stress experienced by the infertile couple, and may facilitate the development of even greater psychological and relationship difficulties (Bresnick, 1981; Seibel & Taymor, 1982; Walker, 1978). The nature, extent, severity and duration of such distress, however, remains to be determined, with rigorous longitudinal research being necessary to identify and assess the relationship between psychological, emotional and relationship distress and the experience of infertility.

Conclusion

Upon critical examination, the research which has been conducted in an attempt to examine and assess the relationship between psychopathology and infertility is seen to be replete with methodological and procedural flaws. Even the assumptions upon which the research has been based appear to be open to question with the knowledge gained by new advancements in medical technology. However, while the

efforts to support a causal relationship between psychopathology and infertility may have been inadequate and perhaps misdirected, the information gained from this research serves to reinforce the fact that the infertile individual and couple may well be differentiated from their multiparous counterparts, on various dimensions of stress-related symptomatology. In almost all cases, the research in this area has been conducted with couples who have undergone or are presently involved in the medical investigation and/or treatment of their infertility. One might infer, therefore, that the infertility experience itself, and the medical investigation and treatment of infertility, represents a stress-inducing life event; an event which may impact negatively on the psychological and emotional lives of the infertile man and woman.

Indeed, the available literature on the psychological, emotional and relationship impact of infertility suggests that the infertile "population suffers an enormous toll in the quality of their life" (Menning, 1982, p. 163), and that infertile couples may require the assistance of a mental health professional in coming to terms with and resolving what in effect constitutes a developmental crisis (Bresnick, 1981; Frank, 1984; Menning, 1979, 1982; Seibel & Taymor, 1982; Wiehe, 1976b). However, a large majority of these static research studies have been based on anecdotal reports and speculation, with generalizations regarding the psychological, emotional and relationship

changes experienced by infertile couples being proffered as evidence of the need for the development of a more interdisciplinary approach to the treatment of infertility (Berger, 1977; Bresnick, 1981; Bresnick & Taymor, 1979; Menning, 1982; Shapiro, 1982). Few studies have been conducted which have attempted to determine the impact of infertility on the lives and relationships of men and women. Of these studies (Bell, 1981; Feuer, 1983; Weltzien, 1983; Wiehe, 1976a; Wilson, 1979), none have been longitudinal assessments utilizing standardized measurements and including relatively large sample sizes, aimed at the experimental identification and validation of the problems of the infertile, and at substantiating the need for the provision of psychological services in this area.

In fact, more questions have been raised than have been answered by this literature, in terms of determining the nature, prevalence, severity and duration of psychological, emotional and relationship difficulties experienced by infertile individuals and couples. For example, while some researchers report that the impact of infertility is greater for women (Bresnick & Taymor, 1979; Weltzien, 1983; Wiehe, 1976b), a recent study by Feuer (1983) of the psychological impact of infertility on the lives of men suggests that the male may also be adversely affected by the infertility experience. Research by Bell (1981) would appear to indicate that an individual's response to infertility is not affected by the identification of the partner with

the organic problem, however other literature tends to support the occurrence of intense guilt, depression and/or periods of sexual dissatisfaction and dysfunction among persons identified as being the partner with the 'problem' (Berger, 1980; Griffin, 1983; Menning, 1982). While researchers suggest that the amount of time a couple remains infertile may be a factor related to the development and maintenance of secondary psychological difficulties (Debrovner & Shubin-Stein, 1975; Weltzien, 1983; Wiehe, 1976a), the significance of this time factor on the intrapersonal and interpersonal lives of the infertile couple remains to be tested. Although some researchers indicate that the couple approach the infertility diagnosis with both the hope and the fear of finding answers to explain their inability to produce a child (Menning, 1977; Rosenfeld & Mitchell, 1979; Steigrad, 1982), the specific impact of diagnostic information regarding the etiology of the problem and the availability and potential success of treatment, has yet to be experimentally examined. As such, while the literature provides valuable information regarding factors that may contribute to the stress of infertility and serves to identify the areas of a couple's life that may be most affected by the infertility experience, several important questions remain unanswered.

Many researchers have called for rigorous longitudinal studies to determine the impact of the infertility experience on the lives and relationships of men and women

(Bell, 1981; Bresnick, 1981; Feuer, 1984; Frank, 1984; Menning, 1977; Seibel & Taymor, 1982; Wilson, 1979). The logistical problems inherent in this task are obvious. However, without such research to identify the needs of the infertile individual and couple, the development of psychological intervention programs to meet these needs cannot be adequately accomplished. At the very least, if we are to provide a more interdisciplinary approach to dealing with the difficulties experienced by infertile men and women we must determine "the impact on the couple of the concurrent medical and physical events involved in the infertility work-up" (Bresnick, 1981, p. 187). In focusing on the psychological, emotional and relationship changes which occur for couples during the course of the medical investigation of their infertility, the present study will begin to provide this necessary information.

Statement of the Null Hypotheses

In attempting to provide medical and mental health practitioners working in the area of reproduction, with the information they require regarding 1. the psychological and relationship changes which occur for men and women during the infertility investigation, 2. the need for, focus and timing of psychological interventions with infertile couples, and 3. the impact of diagnostic information on the stress levels and relationships of couples experiencing difficulty with their fertility, the following

null hypotheses have been generated.

Hypothesis I

The scores obtained by participants will not differ significantly over the four testing periods (initial visit, six weeks later during medical testing, within one week of diagnosis, six weeks post-diagnosis), on the following measures:

(a) the general sensitivity index of the SCL-90-R (GSI)

(b) the Marital Adjustment Test (MAT)

(c) the Relationship Change Scale (RCS)

(d) the Index of Sexual Satisfaction (ISS)

Hypothesis II

The scores obtained by the male and female participants over the four test periods, will not differ significantly, on the following measures:

(a) through (d) as indicated in Hypothesis I

Hypothesis III

The scores obtained by participants over the four testing periods will not differ significantly, on the following subscales of the SCL-90-R:

(a) Somatization

(b) Obsessive-compulsive

(c) Interpersonal sensitivity

(d) Depression

(e) Anxiety

(f) Hostility

(g) Phobic anxiety

(h) Paranoid ideation

(i) Psychoticism

Hypothesis IV

The scores obtained by the male and female participants over the four testing periods will not differ significantly, on the following subscales of the SCL-90-R:

(a) through (i) as indicated in Hypothesis III

Hypothesis V

There will be no significant difference across the four testing sessions, between the scores obtained by participants receiving a negative diagnosis (no treatment available), a positive diagnosis (treatment available), or a neutral diagnosis (no treatment warranted), on the following measures:

(a) through (d) as indicated in Hypothesis I

Hypothesis VI

There will be no significant difference across the four testing periods, between the scores obtained by the male and the female participants receiving a negative diagnosis, a positive diagnosis, or a neutral diagnosis, on the following measures:

(a) through (d) as indicated in Hypothesis I

Hypothesis VII

There will be no significant difference across

the four testing sessions, between the scores obtained by participants receiving a negative diagnosis, a positive diagnosis, or a neutral diagnosis, on the following subscales of the SCL-90-R:

(a) through (i) as indicated in Hypothesis III

Hypothesis VIII

There will be no significant difference across the four testing periods, between the scores obtained by the male and the female participants receiving a negative diagnosis, a positive diagnosis, or a neutral diagnosis, on the following subscales of the SCL-90-R:

(a) through (i) as indicated in Hypothesis III

Hypothesis IX

There will be no significant differences across the four testing sessions, between the scores obtained by the participants who were identified as having an organic fertility problem and the participants who were not identified as having an organic fertility problem, on the following measures:

(a) through (d) as indicated in Hypothesis I

Hypothesis X

There will be no significant differences across the four testing periods, between the scores obtained by the participants who were identified as having an organic fertility problem and the participants who were

not identified as having an organic fertility problem, on the following subscales of the SCL-90-R:

(a) through (i) as indicated in Hypothesis III

Hypothesis XI

The scores obtained by participants over the four testing periods will not differ significantly on the following measures, on the basis of the amount of time each individual had been trying to conceive prior to being recruited for the study:

(a) through (d) as indicated in Hypothesis I

Hypothesis XII

The scores obtained by the participants will not differ significantly over the four testing sessions on the following subscales of the SCL-90-R, on the basis of the amount of time each individual had been trying to conceive prior to being recruited for the study:

(a) through (i) as indicated in Hypothesis III

CHAPTER THREE

METHODOLOGY

Subjects

Sixty-three couples attending the Foothills Hospital Fertility Clinic for the medical investigation of their fertility-related concerns were voluntarily recruited for participation in the study. To be considered eligible for inclusion in the study the couples were required to meet the following subject selection criteria:

1. Both members of each couple were required to initially attend the clinic together, to afford both partners the opportunity to discuss the nature of the study with the researcher, prior to giving their consent to participate in the research and preceding the administration of the first test battery.

2. Both members of the couple were required to consent to participate in the research, to ensure that comparative data were available for each partner and to ethically protect the rights of those individuals who were uncomfortable with, or opposed to sharing or having their spouse share such personal information.

3. Couples participating in the study could not have been previously diagnosed and/or could not be attending the clinic for a second opinion on a previous diagnosis, to ensure that all members of the sample would be progressing through the stages of initial testing and diagnosis. This criterion also assisted in controlling

for past experience with an intensive medical infertility investigation as a factor which may have influenced the research results.

4. Participation was restricted to those couples in which both partners had not parented in the past, to alleviate the possibility of this intervening variable affecting the results of the study, and to allow for the inclusion of individuals who had achieved a pregnancy in the past but whose pregnancy had been terminated (therapeutically or spontaneously) or who had given up a child for adoption at birth.

5. Couples in the study were required to be involuntarily infertile as opposed to those requesting reversal of a voluntary sterilization, thereby eliminating personal choice as a possible variable which may influence an individual's response to his/her infertility and to the medical investigation of his/her infertility.

6. The couples participating in the study were required to have been considered acceptable candidates for an infertility investigation by the clinic staff, following their initial appointment, to ensure that all participants would be proceeding through the four stages of the medical investigation during which psychological testing was to be conducted.

7. Participants in the study could not have had a history of psychiatric disorder and treatment and/or could not be taking mood-altering drugs while involved in

the research, to ensure a homogeneous sample and to alleviate the potential distortion of data by the medication.

Sixty-three couples initially agreed to participate in the research and completed one or more of the four test sessions. Of the initial 63 couples, 12 couples voluntarily withdrew from the study, and 7 couples were dropped from the study by the experimenter due to prolonged problems in reaching a medical diagnosis. One other couple was dropped from the study by the experimenter after the female member of the couple was admitted for recurrent psychiatric care. Eleven couples completed only the initial test session, 8 couples completed only 2 test sessions, and 1 couple withdrew from the study prior to completing the final test session. Reasons given for voluntary withdrawal from the study included a) the male partner's discomfort with the content of the questionnaires and/or with participation in the research (3 couples), b) the occurrence of a pregnancy during the study (2 couples), or c) disruption of the couple's relationship and subsequent separation (1 couple). Of those who voluntarily withdrew from the study, 6 couples provided no reason for their withdrawal.

Medical and demographic information on the characteristics of the research participants was obtained through the clinic files and through the use of a 'Personal Information Sheet' (Appendix A). The demographic characteristics of the subjects who voluntarily withdrew from the study are compared with the characteristics of those who remained

in the study, in Table 1.

Of the 43 couples who remained in the study, the males ranged in age from 23 to 35 years, with a mean age of 29.47 years, while the females ranged from 21 to 34 years old, with a mean age of 28.3 years. Couples in the study had been involved in their present relationship from a period of 2 to 13 years, with a mean of 7 years characterizing the duration of the subjects' relationships. The majority of the men and women in the study (55.8%), had been trying to conceive for a period of 2 to 4 years prior to attending the fertility clinic, with the remainder of the couples having attempted conception for less than 2 years (20.9%), for 4 to 6 years (9.3%), or for more than 6 years (13.9%) respectively.

Of the male participants, 4.6% reported grade school as their highest level of completed education, 48.8% reported having completed high school, 18.6% indicated that they had completed college, and 27.9% reported having completed university. Of the female participants, 4.6% indicated that grade school was their highest level of completed education, 55.8% indicated that they had completed high school, 18.6% reported college as their highest level of completed education, and 20.9% of the women reported having completed university. Of the participating couples 4.6% earned less than $15,000 per year, with 11.6% reporting a combined income of from $15,000 to $25,000, 34.9% reporting a yearly income of from $26,000 to $40,000,

Table 1

Demographic Characteristics of Participants Who Voluntarily Withdrew and Participants Who Completed the Study

		Withdrew		Remained	
		Male	Female	Male	Female
Age:		29.97	29.17	29.47	28.30
Occupation:	Blue Collar	33.3%	0 %	27.9%	0 %
	White Collar	66.7%	83.3%	72.1%	72.1%
	Homemaker	0 %	16.7%	0 %	27.9%
Education:	Grade School	8.3%	0 %	4.6%	4.6%
	High School	25.0%	66.7%	48.8%	55.8%
	College	33.3%	16.6%	18.6%	18.6%
	University	33.3%	16.6%	27.9%	20.9%
		Couples		Couples	
Relationship Duration:		6.58 years		7.00 years	
Years Trying to Conceive Prior to Clinic:	< 2 yrs.	25.0%		20.9%	
	⩾ 2 < 4 yrs.	41.7%		55.8%	
	⩾ 4 < 6 yrs.	16.6%		9.3%	
	⩾ 6 yrs.	16.6%		13.9%	
No. of Past Pregnancies:	0	66.7%		81.3%	
	1 or 2	33.0%		14.0%	
	3 or 4	0 %		4.7%	
Socio-Economic Status:	< $15,000/yr.	0 %		4.6%	
	$15-25,000	16.7%		11.6%	
	$26-40,000	33.3%		34.9%	
	> $40,000	50.0%		48.8%	

Withdrew N=24

Remained N=86

and 48.8% reporting a combined income of over $40,000 per year.

The present occupations of the female participants included 72.1% white collar employment (eg. librarian, secretary, systems analyst), and 27.9% homemaking. The present occupations of the male participants included 27.9% blue collar employment (eg. driller, carpenter, mechanic), and 72.1% white collar employment (eg. accounts executive, retail salesperson, draftsman).

Of the 43 couples who completed the study, 67.4% received a positive diagnosis which indicated a treatable condition such as anovulation, tubal occlusions or endometriosis, 13.9% received a neutral diagnosis indicating that no treatment was warranted (normal infertility), and 18.6% received a negative diagnosis indicating that treatment was not available and the likelihood of pregnancy without intervention was remote. Of the 37 couples identified as having an organic etiology to their fertility problem following the medical investigation, 10.8% (4 couples) were identified as having a male factor problem, 81.1% (30 couples) were identified as having a female factor problem, and 8.1% (3 couples) were identified as having a combined male and female factor etiology to their problem.

Instrumentation

Data were gathered for the research through the use of

six questionnaires which were administered at various times during the medical investigation. The SCL-90-R, developed by Derogatis (1975), provided a measure of the symptomatic psychological distress levels of the participants in the study, the Marital Adjustment Test (MAT) designed by Locke and Wallace (1959) served as a measure of the couples' accommodation to their partner at the time of each of the four testing sessions. Schlein and Guerney's (1977) Relationship Change Scale (RCS) was utilized to provide a measure of the improvement or deterioration in the general quality of the couple's relationship between testing sessions. Changes in the participants' perceived levels of satisfaction with their sexual relationships were measured through the use of Hudson's (1982) Index of Sexual Satisfaction (ISS). The Life Experiences Survey (LES) developed by Sarason, Johnson and Seigel (1978) served as an indication of life changes and the perceived impact of these changes which occurred for participants over the time during which they were included in the study. Finally, the experimenter-generated 'Personal Impressions Questionnaire' (PIQ), provided subjective information on the subjects' impressions of the need for, nature, and timing of psychological intervention in the area of infertility. A detailed description of each of the instruments utilized in the study is presented below.

SCL-90-R

The SCL-90-R is a relatively brief, easy to administer,

90-item, self-report inventory designed to measure various dimensions of symptomatic psychological distress. Conceptually similar to the Hopkins Symptom Checklist (Derogatis, Lipman, Rickels, Uhlenhuth & Covi, 1974a, 1974b), the SCL-90-R measures psychological distress in terms of 9 primary symptom dimensions (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism), and 3 global summary indexes of psychological distress (general sensitivity index, positive symptom total, positive symptom distress index).

A 'time window' provides for flexibility in altering the time referent for administration of the SCL-90-R, thereby allowing the researcher to adjust and individualize the time frame for research purposes. The vocabulary of the SCL-90-R was designed to be as basic as possible, making the instrument appropriate for administration to individuals from 13 to approximately 75 years of age. The SCL-90-R manual contains normative data on psychiatric outpatients, psychiatric inpatients, adolescents, industrial executives and nonpatient normal adults, with separate norms in each case available for men and women.

Coefficient alphas of between .77 and .90 have been reported for the 9 primary symptom dimensions of the SCL-90-R (Derogatis, 1983), attesting to the internal consistency of this measure. SCL-90-R test-retest coefficients for different time periods reportedly range from .78 to .94

(Derogatis, 1983; Edwards, Yarvis, Mueller, Zingale, & Wagman, 1978). Factorial invariance across sex for the 9 primary symptom dimensions of the SCL-90-R has been demonstrated (Derogatis & Cleary, 1977a), and a factor analytic study with a large sample size has served to confirm the clinical-rational dimensional structure of the instrument (Derogatis & Cleary, 1977b). High convergent and discriminant validity have been demonstrated between the SCL-90-R and the MMPI (Derogatis, Rickels, & Rock, 1976), and between the SCL-90-R and the Middlesex Hospital Questionnaire (Boleoucky & Horvath, 1974), thereby providing further support for the validity of this measure.

Derogatis (1982) reports that the SCL-90-R has proven to be very sensitive to change in a wide variety of clinical and medical contexts, ranging from usage with cancer patients (Abeloff & Derogatis, 1977; Craig & Abeloff, 1974; Derogatis, 1980; Derogatis, Abeloff, & Melisaratos, 1979; Rogentine, Van Kammen, Fox, Docherty, & Rosenblatt, 1979), rape victims (Kilpatrick, Veronen, & Resick, 1979), alcohol and substance abusers (Pottenger, McKernon, Patrie, Weissman, Ruben, & Newberry, 1978; Steer & Henry, 1979; Wise & Fernandez, 1977), grief stricken men and women (Horowitz, Krupnick, Kaltreider, Wilner, Leong, & Marmer, 1981), and individuals with sexual dysfunctions (Derogatis, Meyer, & Gallant, 1977). The SCL-90-R has also been utilized in over 100 studies related to stress and the mediation of stress (Derogatis, 1983).

In light of the reported validity and reliability of the SCL-90-R, and taking into consideration the instrument's brevity, available norms for nonpatient normal men and women, and its apparent sensitivity to differences in symptomatic psychological distress levels following intervention (Carrington, Collins, Benson, Robinson, Wood, Lehrer, Wolfolk, & Cole, 1980), as well as the flexibility of the time referent window which allows for the appropriate time between test sessions to be inserted for each participant in the study, the SCL-90-R was determined to be a viable instrument for measuring changes in the symptomatic psychological distress levels of individuals undergoing the medical investigation of their infertility. Also, several of the symptom dimensions measured by the SCL-90-R are similar to the stress-related manifestations reported for infertile individuals (Menning, 1982; Shapiro, 1982), making this instrument an appropriate choice for the present study.

Locke-Wallace Marital Adjustment Test (MAT)

The MAT is a relatively short, 15-item, self-report scale, designed to measure the accommodation of a husband and wife to each other at a given time (Hunt, 1974; Locke & Wallace, 1959). High reliability is claimed for the test as determined by the split-half technique, corrected for by the Spearman Brown Formula, which produced a reliability coefficient of .90 (Locke & Wallace, 1959). Factor analysis of the instrument supports the internal consistency of the MAT, with scores for each factor found to be stable

over a two-year, test-retest interval (Kimmel & Van der Veen, 1974). In testing the MAT, a group of subjects considered maladjusted in marriage on the basis of extensive case data, had a mean adjustment score of 71.7, while a matched group of subjects considered to be exceptionally well-adjusted in marriage had a mean score on the MAT of 135.9 (Locke & Wallace, 1959). On the basis of observations made in the study that 96% of the known well-adjusted group scored 100 or more on the scale, while only 17% of the maladjusted group achieved this score, a cut-off score of 100 points was identified as the dividing line between adjustment and maladjustment in marriage. Scores on the MAT range from 2 points, indicating very low marital adjustment, to 158 points, indicating extremely high marital adjustment.

On the basis of the brevity of the MAT, the available data supporting the scale, and the clearly delineated cut-off score between adjusted and maladjusted relationships, the MAT was determined to be an appropriate instrument for measuring changes in the adjustment of the men and women in the study to their partners, over the course of the medical investigation of their fertility concerns.

Relationship Change Scale (RCS)

The RCS is a brief, 27-item, self-report scale, designed to measure improvement and deterioration in the general quality of a couple's relationship over weekly and/or monthly time periods (Schlein & Guerney, 1977). The time interval

used in the administration of the RCS may be altered to suit the needs of the investigator; a factor that strongly supported the use of this instrument in the present study. Scores on the RCS range from 27 (serious deterioration) to 135 (considerable improvement), with a cumulative score of 81 indicating no change in the individual's overall perception of the quality of his/her relationship.

Areas of investigation included in the scale consist of questions regarding relationship satisfaction, communication, trust, intimacy, sensitivity, openness and understanding, although only one overall change score is calculated on the basis of these dimensions (Guerney, 1977). These areas would appear to be particularly sensitive to the changes which reportedly occur in the relationships of couples experiencing infertility (Bresnick, 1981; Menning, 1977, 1982; Seibel & Taymor, 1982), thereby providing further support for the inclusion of the RCS in the present investigation.

While there have been very few studies conducted to date on the validity and reliability of the RCS, some evidence for the reliability of the instrument as a repeated measure to assess treatment outcomes, as well as for the construct validity of this instrument, may be gleaned from the work of Schlein (1971) and Rappaport (1976). Initial support for the concurrent validity of the RCS is found in the work of Ridley, Jorgensen, Morgan and Avery (in press) and in the work of Schlein (1971). The RCS has also been

used as a measure of treatment outcome and treatment evaluation, to determine change in a couple's relationship quality (Guerney, 1977).

Taking into consideration the dimensions which are measured by the RCS and the time interval flexibility, this instrument was considered to be a viable measure for inclusion in the present study.

Index of Sexual Satisfaction (ISS)

The ISS is a brief, 25-item, self-report measure of the level of satisfaction which an individual perceives in his or her present sexual relationship (Hudson, 1982). This Likert-type scale takes approximately 10 minutes to complete, and is the only brief instrument presently available with sufficient reliability and validity data, which attempts to measure an individual's perception of his or her sexual 'satisfaction', as opposed to sexual functioning.

The ISS has been utilized as an assessment measure of the severity of a couple's sexual dissatisfaction, and for the evaluation of treatment programs (Hudson, 1982). Scores on the ISS range from 0 to 100 with a clinical cut-off score of 30 reportedly reflecting the level of clinical significance to indicate disorder in the sexual area of an individual's relationship. High scores are indicative of more serious problems, while low scores indicate the relative absence of problems.

Hudson (1982) reports discriminant validity of .76 for the ISS, and construct validity of .68. The ISS items

are also reported to have high factorial validity (Hudson, 1982). While more research on this instrument is necessary, the ISS was considered to be an appropriate measure of change in the level of the participants' perceived sexual satisfaction during the course of their medical infertility investigation, given the limited number of viable measurement alternatives in this area of study.

Life Experiences Survey (LES)

The LES is a relatively brief, 57-item, self-report questionnaire, which provides respondents with the opportunity to indicate specific events that they have experienced in their lives during the past year. Based upon many related items of the Holmes and Rahe (1967) Social Readjustment Rating Scale, the LES items are representative of life changes that are frequently experienced by individuals in the general population; changes which may potentially impact significantly on the lives of the persons experiencing them (Sarason *et al.*, 1978).

The format of the LES allows individuals to indicate whether the events in question occurred within the past 6 months or from 7 to 12 months previously, and to identify on a 7-point, Likert-type scale their subjective assessments of the desirability and personal impact of the events they have experienced. A positive change score, a negative change score and a total change score may be obtained by summing the impact ratings of the events experienced by

each respondent. The negative change index of the LES has been reported to have a stronger relationship to stress-related outcome measures than the total change score and/or the positive change score (Sarason *et al.*, 1978).

Test-retest reliability studies conducted on the LES for a 5- to 6-week time interval report reliability coefficients of .19 and .53 for the positive change score, .56 and .88 for the negative change score, and .63 and .64 for the total change score. The change scores of the LES have also been found to correlate well with other stress-related dependent measures of anxiety, locus of control and depression (Sarason *et al.*, 1978).

Based upon the relative brevity, the available data and the subjective desirability and impact rating scales of the LES, this instrument was determined to be appropriate for assessing other changes which occurred in the lives of the infertile couples during the study, which may have been related to their scores on the dependent measures being utilized in the research.

Personal Impressions Questionnaire (PIQ)

A brief, subjective, summative questionnaire to assess participants' impressions of the need for, nature and timing of psychological assistance in the area of infertility was administered at the conclusion of the study. A copy of this experimenter-generated questionnaire may be found in Appendix B.

Procedure

Having secured the support and cooperation of the Director and medical staff of the Foothills Hospital Fertility Clinic, a proposal for the present research was submitted for ethical approval to the Joint Ethics Committee of the University of Calgary and the Foothills Hospital. Ethical approval was granted (Appendix C), with the understanding that participation in the study was to be informed and voluntary at all stages of the research, as indicated in the consent form appended to each initial test package (Appendix D).

Subjects were recruited for the study during their initial visit to the clinic, if they met the criteria for subject selection previously discussed in this chapter. Each of the three clinic physicians were advised of the nature and requirements of the research, and proceeded to discuss the study with those couples meeting the selection criteria, at the conclusion of each couples' initial medical visit.

Couples who were interested in participating in the study and who were available to complete the first assessment while at the clinic, were referred to the experimenter. The purpose, nature and requirements of individual participation in the study were carefully and clearly delineated to each couple by the experimenter, and an opportunity was provided for any questions and queries regarding the research to be addressed.

If one or both members of the couple were hesitant about participating in the study, they were provided with ten minutes of privacy, during which time they could independently discuss the study and peruse the consent form and the questionnaires. Couples in which one or both partners were not interested in, or comfortable with participating in the research were thanked for their time and consideration and were assured that their refusal to participate in the study would in no way influence their medical treatment at the clinic. Couples in which both partners were interested in being involved in the research, were asked to thoroughly read and to sign the consent form appended to the outside of their questionnaire package.

Each couple was then asked to complete the first battery of test instruments, including the 'Personal Information Sheet', while remaining at the clinic. Couples were placed in separate offices, and were given specific instructions regarding the completion of the questionnaires (Appendix E). Partners were separated during the test sessions, to maintain confidentiality, and to ensure that they could not influence the responses of their spouse to the various questionnaires, thereby maintaining the validity of the study.

All couples who participated in the research were required to complete the first battery of test instruments while at the clinic, where the experimenter was available to answer any questions regarding the questionnaires. This

also provided the experimenter with an opportunity to gauge how each couple felt about continuing their participation in the research following the completion of the first test battery.

If both members of the couple were willing to continue to be involved in the study, they were placed on the research mailing list and given a code number to ensure confidentiality for the remainder of the study. The research instruments were then forwarded by mail to each member of the couple independently of the other, at the following times:

1. One month following their initial visit to the clinic, when medical testing was being conducted (eg. semen samples, progesterone readings, blood work, laparoscopy, etc.).

2. At the point of diagnosis, when the couples were informed of all of the test results. The time frame between testing and the receipt of a diagnosis differed for each couple, with some couples receiving a diagnosis within four weeks of testing and other couples who required more extensive testing receiving their diagnosis up to 24 weeks following the completion of the second set of test instruments.

3. Six weeks after the couple received their diagnosis.

Questionnaires for the second, third and fourth test sessions were forwarded by mail three days prior to the day they were to be completed, to ensure that all subjects

received their test packages at the appropriate times.

Specific instructions for the completion of the questionnaires were enclosed in each participant's questionnaire package, for each of the remaining three test sessions (Appendix F). Subjects were requested to complete the test instruments as soon as possible and to return the questionnaires to the experimenter by mail in the addressed, stamped envelopes provided. The importance of completing the questionnaires independent of their spouse was stressed to each couple, and all subjects were asked during each test session to withhold discussion of their responses on these measures until all of the test instruments had been completed and returned for that test session.

If the questionnaires were not returned within 21 days of being mailed, the experimenter contacted the respective individuals involved by mail, to determine whether they were still interested in being participants in the study, and to encourage them to return the isntruments. An example of the letter forwarded to these individuals may be found in Appendix G. Couples who did not respond by mail or phone following receipt of this letter were dropped from the study at that time and no further information was exchanged. If one member of the couple chose to discontinue his or her participation in the study at this time, both members of the couple were informed that they would have to be dropped from the research, to ethically ensure the

privacy of the non-participating member of the couple, and to ensure that an equal sample of men and women were maintained throughout the study. Couples in which both partners were interested in continuing in the study, were encouraged to complete the questionnaire within 48 hours, and to return them to the experimenter as soon as possible. If the questionnaires were not returned within the next 14 days the couple in question was dropped from the study. Couples who had not received a diagnosis after several months of investigation were also dropped from the study at the conclusion of the research. A copy of the letter which was forwarded to these individuals may be found in Appendix H.

All participants were asked to complete the SCL-90-R, the RCS, the MAT and the ISS during each of the four test sessions. The LES was administered during the final testing session. The instruments were counterbalanced in terms of their presentation, utilizing a randomized Latin square design, with each participant receiving the questionnaires in a different order, on each of the four test occasions, thereby assisting in alleviating the possibility of carry over and order effects. The PIQ was distributed in the final testing sessions, following completion of the other test instruments. A form for requesting a condensed copy of the research results was also included in the final test package (Appendix I).

Treatment of the Data

Primary analysis of the data was conducted utilizing the BMDP computer program 4V statistical software package for univariate and multivariate analysis of variance. The BMDP4V package was selected because of the flexibility and comprehensiveness of the MANOVA program, for the ability of the package to handle more than one dependent measure in the multivariate repeated measurements analysis, and because of the program's unique usage of "a cell-weighting system to specify hypotheses to be tested, particularly with respect to adjustment for unequal n" (Tabachnick & Fidell, 1983, p. 263-264). The BMDP4V package was also utilized to test the simple main effects when significant interactions were found between the variables being tested. Post-hoc testing for significant main effects was carried out utilizing the Newman-Keuls method of testing the difference between all possible pairs of means, as recommended by Winer (1971).

CHAPTER FOUR

RESULTS

Introduction

The results obtained from the statistical and supplementary analysis of the data are presented in the present chapter. Only the data obtained from the 86 participants who completed the four testing sessions have been included in the analysis. Raw scores were utilized in the analysis for all dependent measures in the study, with the exception of the General Symptom Index and the nine subscales of the SCL-90-R. In the case of the SCL-90-R, participants' raw scores were converted to area t-scores for the purpose of analysis, as recommended by Derogatis (1983).

Due to the complexity of the statistical procedures utilized in the data analysis, and the magnitude of data generated by these statistical procedures, only the main effects and interactions which reached a significance level of $p \leqslant .10$ are reported in the summary tables for each hypothesis. Of the three multivariate test criteria provided by the BMDP4V analysis, Wilk's Lambda (L Ratio) is reported when available, as the desired choice of significance test for the multivariate F (Tabachnick & Fidell, 1983; Winer, 1971). In all cases where Wilk's Lambda multivariate F is not available, Hotelling's T-squared (TSQ) is reported as the multivariate F test of significance. Rejection of the hypothesis is based on a significance level of $p \leqslant .05$.

In cases where the multivariate F was not found to be significant and the univariate F did reach significance, the nonsignificant multivariate F is reported and the univariate F, being sometimes more powerful, is interpreted with caution (Tabachnick & Fidell, 1983).

Tests of the Hypotheses

Hypothesis I

A multivariate analysis of variance with repeated measurements was conducted to determine whether the scores obtained by the research participants on the ISS, the MAT, the RCS, or the GSI, differed significantly across the four testing periods. A summary of the mean scores, the standard deviations, the univariate within contrast mean squares, the F ratios and the probability levels for each instrument over the four testing sessions is presented in Table 2.

The scores obtained by the 86 participants were not found to differ significantly across the four test sessions on (a) the ISS, (b) the MAT, or on (c) the RCS, at a $p \leqslant .05$ level of significance. Therefore, components (a), (b), and (c) of the null Hypothesis I were not rejected. Significant differences were found, however, between the scores obtained by the participants across the four testing periods, on (d) the GSI of the SCL-90-R, at a significance level of $p \leqslant .05$. Therefore, component (d) of the null Hypothesis I was rejected.

Table 2

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by Participants on the ISS, MAT, RCS and GSI Over the Four Test Sessions

	Mean	S.D.	MS	F	p
Multivariate L Ratio				4.51	.0000**
Index of Sexual Satisfaction					
Session 1	18.73	13.70	13.9797	.36	.7801
Session 2	18.36	16.77			
Session 3	18.94	17.01			
Session 4	19.33	17.66			
Marital Adjustment Test					
Session 1	117.6	17.93	175.359	2.10	.1008
Session 2	115.2	20.68			
Session 3	114.5	22.64			
Session 4	114.6	21.25			
Relationship Change Scale					
Session 1	89.49	11.73	146.817	1.69	.1688
Session 2	87.27	12.20			
Session 3	87.64	12.58			
Session 4	86.38	11.69			
General Symptom Index					
Session 1	57.12	10.64	556.817	13.56	.0000**
Session 2	51.85	10.61			
Session 3	52.56	12.46			
Session 4	51.81	13.42			

n=86
**p $\leq$ .01
univariate df 3,255
multivariate df 12,667

In conducting the post-hoc testing on the means of the GSI scores obtained by the participants, using the Newman-Keuls procedure, significant differences were apparent at a $p \leq .05$ level, between session 1 and session 2 GSI scores, session 1 and session 3 GSI scores, and session 1 and session 4 GSI scores (see Table 3). However, significant differences were not found between the mean GSI scores for any of the remaining sessional comparisons.

Hypothesis II

To determine if there was a significant difference between the scores obtained by the male participants and the scores obtained by the female participants on the ISS, the MAT, the RCS, and the GSI across the four time periods during which testing was conducted, a multivariate analysis of variance with repeated measurements was carried out. Table 4 presents a summary of the mean scores and standard deviations obtained by the 43 males and the 43 females in the study, on each of the four dependent measures, as well as the univariate within contrast mean squares, the F ratios and the probability levels for the interaction between the sex variable and the time period variable. Mean squares, degrees of freedom, F ratios and probability levels are presented in Table 5, for the main effects and interactions which reached a significance level of $p \leq .10$.

A significant difference between the scores obtained

Table 3

Tests on the Means of the GSI Using the Newman-Keuls Procedure:

Hypothesis I

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.92	0.04	0.00		
Session 3	2.30	0.75	0.71	0.00	
Session 1	2.52	5.31*	5.27*	4.56*	0.00

*$p \leq .05$

Table 4

Means, Standard Deviations, F Ratios and Probability Levels for the Scores Obtained by the Male and the Female Participants on the ISS, MAT, RCS and GSI Over the Four Test Sessions

	MALES		FEMALES		MS	F	P
	Mean	S.D.	Mean	S.D.			
Index of Sexual Satisfaction					72.2432	1.89	.1312
Session 1	20.58	13.41	16.88	13.90			
Session 2	18.91	16.02	17.81	17.66			
Session 3	19.91	15.41	18.07	18.62			
Session 4	18.95	16.14	19.70	19.24			
Marital Adjustment					137.608	1.66	.1762
Session 1	112.10	18.79	123.00	15.42			
Session 2	110.10	22.28	120.40	17.74			
Session 3	110.00	24.44	119.10	19.93			
Session 4	111.90	22.63	117.20	19.68			
Relationship Change					106.158	1.23	.3000
Session 1	88.72	12.30	90.26	11.22			
Session 2	85.93	12.65	88.60	11.72			
Session 3	86.21	12.25	89.07	12.89			
Session 4	87.35	11.25	85.42	12.16			
General Sensitivity Index					109.662	2.72	.0448*
Session 1	57.02	11.88	57.12	9.39			
Session 2	51.84	11.15	51.86	10.18			
Session 3	50.14	13.10	54.98	11.44			
Session 4	50.63	15.03	53.00	11.65			

n=86
df 3,252
*$p \leq .05$

Table 5

Mean Squares, F Ratios and Probability Levels for the Main Effects and Interactions of Hypothesis II

	MS	F	df	p
Between Contrasts				
SEX: multivariate TSQ		3.64	4,810	.0089**
MAT	6813.840	4.87	1,840	.0301*
Within Contrasts				
PERIOD: multivariate L Ratio		4.56	12,659	.0000**
MAT	175.359	2.12	3,252	.0988
GSI	556.817	13.83	3,252	.0000**
PERIOD x SEX: multivariate L Ratio		1.44	12,659	.1413
GSI	109.662	2.72	3,252	.0448*

*$p \leq .05$
**$p \leq .01$

by the male participants and the scores obtained by the female participants, across the four testing sessions, was not observed on (a) the ISS, (b) the MAT, or on (c) the RCS, at a significance level of $p \leqslant .05$. Therefore, components (a), (b), and (c) of the null Hypothesis II were not rejected. However, a significant difference was found at a $p \leqslant .05$ level, between the scores obtained by the male participants and the scores obtained by the female participants, across the four testing sessions, on (d) the GSI. Therefore, component (d) of the null Hypothesis II was rejected. Significant main effects were observed on both the sex variable and the time period variable, suggesting that significant differences existed between the scores obtained by the male participants and the scores obtained by the female participants on the MAT ($p \leqslant .05$), and that significant differences existed between the scores obtained by all participants on the GSI, across the four testing periods ($p \leqslant .01$).

Results of the tests on the simple main effects of sex and period for the GSI suggest that the scores obtained by the females differed significantly across the four testing sessions ($p \leqslant .01$), and that the scores obtained by the male participants also differed significantly across the four testing sessions ($p \leqslant .01$), with the most substantial differences occurring between the GSI scores obtained by the men and women on the third session ($p \leqslant .07$) (see Table 6). Post-hoc testing of the main effect on the GSI for

Table 6

Results of Tests on the Simple Main Effects of Sex and Period for the GSI

	MS	F	df	p
Between Contrasts				
Period x Female	237.324	5.89	3,252	.0007**
Period x Male	429.155	10.66	3,252	.0000**
Within Contrasts				
Period 1 x Sex	0.744186	.01	1,840	.9360
Period 2 x Sex	0.116279	.00	1,840	.9920
Period 3 x Sex	503.070000	3.33	1,840	.0717
Period 4 x Sex	120.977000	.67	1,840	.4156

**$p \leq .01$

the period variable was not conducted, due to the confounding of this factor with the significant period by sex interaction on the GSI.

Hypothesis III

A multivariate analysis of variance with repeated measurements was conducted to determine the significance of the differences between the scores obtained by the research participants, on the nine subscales of the SCL-90-R, across the four testing periods. A summary of the mean scores, the standard deviations, the univariate within contrast mean squares, the F ratios and the probability levels for each of the nine SCL-90-R subscales, across the four testing periods, is presented in Table 7.

A significant difference between the scores obtained by the 86 participants, across the four testing sessions, was not observed on (g) the Phobic Anxiety scale of the SCL-90-R, at a significance level of $p \leqslant .05$. Therefore, the null Hypothesis III was not rejected for component (g). Significant differences at a $p \leqslant .01$ level were found, however, between the scores obtained by the participants, across the four testing sessions, on (a) the Somatization scale, (b) the Obsessive-Compulsive scale, (c) the Interpersonal Sensitivity scale, (d) the Depression scale, (e) the Anxiety scale, (f) the Hostility scale, (h) the Paranoid Ideation scale, and on (i) the Psychoticism scale of the SCL-90-R. Therefore, components (a), (b), (c), (d),

Table 7

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by Participants on the 9 Subscales of the SCL-90-R, Over the 4 Test Sessions

			Mean	S.D.	MS	F	P
Multivariate L Ratio						2.69	.0000**
SOMATIZATION:	Session	1	50.17	11.57	316.531	5.86	.0007**
		2	47.01	11.80			
		3	47.12	12.78			
		4	45.63	11.68			
OBSESSIVE-COMPULSIVE:	Session	1	57.17	12.05	1048.360	16.20	.0000**
		2	50.92	11.92			
		3	50.69	13.70			
		4	49.37	14.69			
INTERPERSONAL SENSITIVITY:	Session	1	57.65	11.45	565.352	9.13	.0000**
		2	51.85	11.34			
		3	53.52	11.86			
		4	52.76	12.58			
DEPRESSION:	Session	1	56.87	9.99	232.942	4.16	.0067**
		2	53.45	11.73			
		3	54.48	13.17			
		4	53.31	15.23			
ANXIETY:	Session	1	54.05	12.88	431.039	6.27	.0004**
		2	48.93	11.35			
		3	50.12	14.18			
		4	50.07	12.87			
HOSTILITY:	Session	1	55.00	12.97	308.825	4.30	.0055**
		2	50.70	12.37			
		3	51.92	12.73			
		4	51.42	11.75			
PHOBIC ANXIETY:	Session	1	46.28	9.21	21.9176	.42	.7381
		2	45.43	9.75			
		3	45.41	9.97			
		4	45.10	9.08			
PARANOID IDEATION:	Session	1	52.09	12.71	375.871	6.20	.0004**
		2	49.15	13.14			
		3	47.78	12.45			
		4	47.55	12.42			
PSYCHOTICISM:	Session	1	56.85	11.63	396.863	7.93	.0000**
		2	52.15	11.51			
		3	52.63	11.97			
		4	53.08	12.55			

n=86
*p ⩽ .05
**p ⩽ .01
univariate df 3,255
multivariate df 27,722

(e), (f), (h), and (i) of the null Hypothesis III were rejected.

Post-hoc testing was conducted on the means of each of the above-mentioned significant measures, using the Newman-Keuls procedure to determine between which testing sessions the scores differed significantly. Tables 8 through 15 present the results of the post-hoc tests, suggesting that in the case of each of the dependent measures in question, significant differences existed at a $p \leq .05$ level, between the session 1 and session 2 scores, the session 1 and session 3 scores, and the session 1 and session 4 scores. Significant differences were not found, however, between the mean scores on each of these dependent measures for any of the remaining sessional comparisons.

Hypothesis IV

A multivariate analysis of variance with repeated measurements was conducted to determine if there were significant differences between the scores obtained by the male participants and the scores obtained by the female participants on the nine subscales of the SCL-90-R, across the four test periods. Table 16 presents a summary of the mean scores and standard deviations obtained by the 43 male and the 43 female participants, on the nine subscales of the SCL-90-R across the four test sessions, as well as the univariate within contrast mean squares, the

Table 8

Tests on the Means of the Somatization Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	2.20	1.38	0.00		
Session 3	2.64	1.49	0.11	0.00	
Session 1	2.89	4.54*	3.16*	3.05*	0.00

*p ≤ .05

Table 9

Tests on the Means of the Obsessive-Compulsive Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	2.41	1.32	0.00		
Session 2	2.89	1.55	0.23	0.00	
Session 1	3.17	7.80*	6.48*	6.25*	0.00

*p ≤ .05

Table 10

Tests on the Means of the Interpersonal Sensitivity Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	2.36	0.91	0.00		
Session 3	2.83	1.67	0.76	0.00	
Session 1	3.10	5.80*	4.89*	4.13*	0.00

*p ⩽ .05

Table 11

Tests on the Means of the Depression Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	2.24	0.14	0.00		
Session 3	2.69	1.17	1.03	0.00	
Session 1	2.95	3.56*	3.42*	2.39*	0.00

*p ⩽ .05

Table 12

Tests on the Means of the Anxiety Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	2.49	1.14	0.00		
Session 3	2.98	1.19	0.05	0.00	
Session 1	3.26	5.12*	3.98*	3.93*	0.00

*p ⩽ .05

Table 13

Tests on the Means of the Hostility Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	2.54	0.72	0.00		
Session 3	3.04	1.22	0.50	0.00	
Session 1	3.33	4.30*	3.58*	3.08*	0.00

*p ⩽ .05

Table 14

Tests on the Means of the Paranoid Ideation Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	2.33	0.23	0.00		
Session 2	2.80	1.60	1.37	0.00	
Session 1	3.06	4.54*	4.31*	2.94*	0.00

*p ⩽ .05

Table 15

Tests on the Means of the Psychoticism Scale Using the Newman-Keuls Procedure: Hypothesis III

	Critical Values	Session 2	Session 3	Session 4	Session 1
Session 2	0.00	0.00			
Session 3	2.12	0.48	0.00		
Session 4	2.54	0.93	0.45	0.00	
Session 1	2.79	4.70*	4.22*	3.77*	0.00

*p ⩽ .05

Table 16

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Male Participants and the Female Participants, on the 9 SCL-90-R Subscales, Across the 4 Testing Sessions

			MALES		FEMALES		MS	F	P
			Mean	S.D.	Mean	S.D.			
SOMATIZATION:	Session	1	49.14	13.51	51.21	9.28	84.2054	1.57	.1973
		2	46.93	13.12	47.09	10.47			
		3	44.67	13.33	49.56	11.86			
		4	44.05	13.35	47.21	9.62			
OBSESSIVE-COMPULSIVE:	Session	1	57.67	12.68	56.67	11.50	240.4680	3.84	.0103**
		2	51.12	12.69	50.72	11.25			
		3	47.53	15.14	53.84	11.42			
		4	48.07	16.13	50.67	13.17			
INTERPERSONAL-SENSITIVITY:	Session	1	56.40	11.54	58.91	11.36	20.5688	.33	.8040
		2	50.02	11.16	53.67	11.37			
		3	51.37	11.89	55.67	11.56			
		4	50.37	13.16	55.14	11.62			
DEPRESSION:	Session	1	56.21	11.37	57.53	8.48	163.6280	2.99	.0316*
		2	54.07	13.14	52.84	10.26			
		3	51.88	14.83	57.07	10.83			
		4	51.63	17.38	55.00	12.71			
ANXIETY:	Session	1	54.65	11.97	53.44	13.85	57.1938	.83	.4785
		2	50.09	10.09	47.77	12.49			
		3	49.35	14.24	50.88	14.24			
		4	50.23	12.66	49.91	13.22			

Males n=43
Females n=43
df 3,252
*p $\leq$ .05
**p $\leq$ .01

Table 16 (Continued)

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Male Participants and the Female Participants, on the 9 SCL-90-R Subscales, Across the 4 Testing Sessions

			MALES		FEMALES		MS	F	p
			Mean	S.D.	Mean	S.D.			
HOSTILITY:	Session	1	55.37	13.61	54.63	12.46	78.4370	1.09	.3520
		2	51.16	13.85	50.23	10.83			
		3	50.33	13.27	53.51	12.10			
		4	50.95	11.58	51.88	12.03			
PHOBIC ANXIETY:	Session	1	43.53	7.48	49.02	10.02	80.0572	1.55	.2027
		2	43.35	8.63	47.51	10.44			
		3	43.51	8.18	47.30	11.26			
		4	44.65	9.28	45.56	8.95			
PARANOID IDEATION:	Session	1	51.05	13.79	53.14	11.60	11.3362	.19	.9064
		2	47.91	13.59	50.40	12.72			
		3	46.28	12.16	49.28	12.69			
		4	46.91	12.95	48.19	11.99			
PSYCHOTICISM:	Session	1	55.44	13.42	58.26	9.45	127.8090	2.60	.0527*
		2	51.44	11.54	52.86	11.57			
		3	49.14	10.94	56.12	12.06			
		4	50.60	13.33	55.56	11.34			

Males n=43
Females n=43
df 3,252
*p $\leqslant$ .05

F ratios and the probability levels of the interaction between the sex variable and the time variable. Mean squares, degrees of freedom, F ratios and probability levels for the main effects and interactions which reached a significance level of $p \leqslant .10$ are presented in Table 17.

A significant difference between the scores obtained by the male participants and the scores obtained by the female participants across the four testing sessions, was not observed on (a) the Somatization scale, (c) the Interpersonal Sensitivity scale, (e) the Anxiety scale, (f) the Hostility scale, (g) the Phobic Anxiety scale, or on (h) the Paranoid Ideation scale of the SCL-90-R, at a significance level of $p \leqslant .05$. Therefore, the null Hypothesis IV was not rejected for components (a), (c), (e), (f), (g), and (h). However, a significant difference was found between the scores obtained by the male participants and the scores obtained by the female participants, across the four testing sessions on (b) the Obsessive-Compulsive scale, at a $p \leqslant .01$ level of significance, and on (d) the Depression scale, and (i) the Psychoticism scale, at a $p \leqslant .05$ level of significance. Therefore, components (b), (d), and (i) of the null Hypothesis IV were rejected.

Significant main effects were observed on both the sex and time period variables, suggesting that significant differences existed between the scores obtained by the male participants and the scores obtained by the female participants, on the Phobic Anxiety scale ($p \leqslant .05$), and

Table 17

Mean Squares, F Ratios and Probability Levels for the Main Effects and Interactions of Hypothesis IV

	MS	F	df	p
Between Contrasts				
SEX: multivariate TSQ		2.35	9,760	.0211*
Interpersonal Sensitivity	1247.17	3.44	1,840	.0671
Phobic Anxiety	1106.65	5.68	1,840	.0194*
Psychoticism	1404.14	3.45	1,840	.0666
Within Contrasts				
PERIOD: multivariate L Ratio		2.76	27,713.25	.0000**
Somatization	316.531	5.90	3,252	.0007**
Obsessive Compulsive	1048.360	16.74	3,252	.0000**
Interpersonal Sensitivity	565.352	9.06	3,252	.0000**
Depression	232.942	4.26	3,252	.0059**
Anxiety	431.039	6.25	3,252	.0004**
Hostility	308.825	4.31	3,252	.0055**
Paranoid Ideation	375.871	6.14	3,252	.0005**
Psychoticism	396.863	8.07	3,252	.0000**
PERIOD x SEX: multivariate L Ratio		1.25	27,713	.1831
Obsessive Compulsive	240.468	3.84	3,252	.0103**
Depression	163.628	2.99	3,252	.0316*
Psychoticism	127.809	2.60	3,252	.0527*

*$p \leq .05$
**$p \leq .01$

that significant differences existed between the scores obtained by all participants across the four testing periods on all but the Phobic Anxiety scale, at a $p \leq .01$ level.

Results of the tests on the simple main effects of sex and period are presented in Table 18. It would appear that the scores obtained by the female participants on the Obsessive-Compulsive scale, the Depression scale, and the Psychoticism scale differed significantly across the four testing periods ($p \leq .01$), and that the scores obtained by the male participants on these three SCL-90-R subscales also differed significantly across the four testing sessions ($p \leq .01$). The most substantial differences occurred between the scores obtained by the men and women on the Obsessive-Compulsive scale ($p \leq .05$) and the Depression scale ($p \leq .07$), for the third testing period. Male and female differences in the scores obtained on the Psychoticism scale were found to be most substantial for the third testing session ($p \leq .01$) and for the fourth testing session ($p \leq .07$).

Post-hoc testing of the main effects on the Obsessive-Compulsive scale, the Depression scale, and the Psychoticism scale for the period variable was not conducted due to the confounding of this period factor with the significant period by sex interaction. However, the Newman-Keuls procedure was utilized to determine between which testing sessions the scores for the Somatization,

Table 18

Results of the Tests on the Simple Main Effects of Sex and Period for the Obsessive-Compulsive, Depression and Psychoticism Scales of the SCL-90-R

	MS	F	df	p
Between Contrasts				
Period x Female:				
Obsessive-Compulsive	355.504	5.68	3,252	.0009**
Depression	199.184	3.64	3,252	.0134**
Psychoticism	211.969	4.31	3,252	.0055**
Period x Male:				
Obsessive-Compulsive	933.324	14.90	3,252	.0000**
Depression	197.386	3.61	3,252	.0140**
Psychoticism	312.703	6.36	3,252	.0004**
Within Contrasts				
Period 1 x Sex:				
Obsessive-Compulsive	21.500	.15	1,840	.7027
Depression	37.7791	.38	1,840	.5417
Psychoticism	170.244	1.26	1,840	.2642
Period 2 x Sex:				
Obsessive-Compulsive	3.3605	.02	1,840	.8789
Depression	32.6628	.24	1,840	.6290
Psychoticism	43.2674	.32	1,840	.5707
Period 3 x Sex:				
Obsessive-Compulsive	853.965	4.75	1,840	.0321*
Depression	578.244	3.43	1,840	.0676
Psychoticism	1046.510	7.90	1,840	.0062**
Period 4 x Sex:				
Obsessive-Compulsive	145.860	.67	1,840	.4143
Depression	244.477	1.06	1,840	.3073
Psychoticism	527.547	3.44	1,840	.0670

*$p \leq .05$
**$p \leq .01$

Interpersonal Sensitivity, Anxiety, Hostility, and Paranoid Ideation scales differed significantly. Tables 19 through 23 present the results of the post-hoc tests, again suggesting that for each of these measures, significant differences were found at a $p \leq .05$ level, between the first and second session scores, the first and third session scores, and the first and fourth session scores. However, significant differences were not found between the mean scores on each of the above-mentioned dependent measures, for any of the remaining sessional comparisons.

Hypothesis V

A multivariate analysis of variance with repeated measurements was conducted to determine if significant differences existed between the scores obtained by those participants who received a positive diagnosis (treatment available), those who received a negative diagnosis (no treatment available), and those who received a neutral diagnosis (no treatment warranted - normal infertility) on the ISS, MAT, RCS, and GSI, across the four testing periods. Table 24 presents a summary of the mean scores and standard deviations for the participants in each of the three diagnostic categories, on the four instruments, over the four testing sessions, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the interactions between the scores obtained by the participants in the three diagnostic

Table 19

Tests on the Means of the Somatization Scale Using the Newman-Keuls Procedure: Hypothesis IV

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.55	1.38	0.00		
Session 3	1.86	1.49	0.11	0.00	
Session 1	2.04	4.54*	3.16*	3.05*	0.00

*p ⩽ .05

Table 20

Tests on the Means of the Interpersonal Sensitivity Scale Using the Newman-Keuls Procedure: Hypothesis IV

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.67	0.91	0.00		
Session 3	2.01	1.67	0.76	0.00	
Session 1	2.20	5.80*	4.89*	4.13*	0.00

*p ⩽ .05

Table 21

Tests on the Means of the Anxiety Scale Using the Newman-Keuls Procedure: Hypothesis IV

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.76	1.14	0.00		
Session 3	2.11	1.19	0.05	0.00	
Session 1	2.31	5.12*	3.98*	3.93*	0.00

*p ≤ .05

Table 22

Tests on the Means of the Hostility Scale Using the Newman-Keuls Procedure: Hypothesis IV

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.79	0.72	0.00		
Session 3	2.15	1.22	0.50	0.00	
Session 1	2.36	4.30*	3.58*	3.08*	0.00

*p ≤ .05

Table 23

Tests on the Means of the Paranoid Ideation Scale Using the Newman-Keuls Procedure: Hypothesis IV

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	1.66	0.23	0.00		
Session 2	1.99	1.60	1.37	0.00	
Session 1	2.18	4.54*	4.31*	2.94*	0.00

*$p \leq .05$

Table 24

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants in the 3 Diagnostic Categories, on the ISS, MAT, RCS and GSI, Across the 4 Testing Sessions

		POSITIVE		NEGATIVE		NEUTRAL		MS	F	p
		Mean	S.D.	Mean	S.D.	Mean	S.D.			
ISS:	Session 1	18.20	14.23	15.21	10.36	25.50	13.07	25.6218	.66	.6827
	Session 2	18.40	17.71	12.86	11.64	24.58	15.79			
	Session 3	18.75	18.38	15.43	11.21	24.00	15.21			
	Session 4	18.60	18.34	14.79	11.64	28.25	18.13			
MAT:	Session 1	115.90	17.00	122.50	16.16	120.20	23.92	80.2711	.96	.4530
	Session 2	115.00	20.05	118.20	14.71	113.10	29.59			
	Session 3	112.40	24.57	119.80	17.27	119.00	17.07			
	Session 4	112.70	22.30	119.80	14.96	117.80	22.16			
RCS:	Session 1	89.57	12.13	88.79	12.56	89.92	9.30	111.604	1.30	.2592
	Session 2	88.03	12.15	89.50	14.32	80.83	7.78			
	Session 3	86.68	12.14	90.00	17.48	89.67	7.40			
	Session 4	86.55	12.36	87.64	9.60	84.08	10.90			
GSI:	Session 1	56.68	11.42	58.43	9.36	57.75	8.27	22.4310	.54	.7774
	Session 2	50.68	10.50	53.79	9.34	55.42	12.23			
	Session 3	52.02	13.79	54.36	8.36	53.17	9.58			
	Session 4	51.33	13.74	51.71	10.93	54.33	15.14			

Positive n=60
Negative n=14
Neutral n=12
df 6,249

categories, on the ISS, the MAT, the RCS, and the GSI, across the four testing sessions. Mean squares, degrees of freedom, F ratios, and probability levels for all main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 25.

A significant difference between the scores obtained across the four testing sessions by those participants who received a positive diagnosis, those who received a negative diagnosis, and those who received a neutral diagnosis was not observed on (a) the ISS, (b) the MAT, (c) the RCS, or on (d) the GSI, at a significance level of $p \leq .05$. Therefore, components (a), (b), (c), and (d) of the null Hypothesis V were not rejected.

Significant main effects were observed for the time period variable, again suggesting that significant differences existed between the scores obtained by all participants, across the four testing sessions, on the GSI ($p \leq .01$). Post-hoc testing results utilizing the Newman-Keuls procedure to test the means of the GSI, suggest that significant differences at a $p \leq .05$ level occurred between the first and second session GSI scores, the first and third session GSI scores, and the first and fourth session GSI scores (Table 26). However, significant differences were not found between the mean GSI scores for any of the remaining sessional comparisons.

Table 25

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis V

	MS	F	df	p
Between Contrasts:				
Diagnosis: multivariate L Ratio		1.62	8,160	.1236
		No significant differences		
Within Contrasts:				
Period: multivariate L Ratio		3.21	12,651	.0002**
GSI	289.994	6.98	3,249	.0002**
Period x Diagnosis:				
multivariate L Ratio		1.06	24,144	.3931
		No significant differences		

*p ⩽ .05
**p ⩽ .01

Table 26

Tests on the Means of the GSI Using the Newman-Keuls Procedure: Hypothesis V

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.12	0.04	0.00		
Session 3	1.34	0.75	0.71	0.00	
Session 1	1.46	5.31*	5.27*	4.56*	0.00

*p ⩽ .05

Hypothesis VI

A multivariate analysis of variance with repeated measurements was conducted to determine if significant differences existed between the scores obtained across the four testing periods, on the ISS, MAT, RCS, and GSI, by the male participants and by the female participants who received a positive diagnosis, a negative diagnosis, or a neutral diagnosis. Table 27 presents a summary of the mean scores and standard deviations obtained by the males and by the females in each of the three diagnostic categories, on the four testing instruments, over the four testing sessions, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the three-way interactions between the sex of the participants, the three categories of diagnostic information received by the participants, and their scores across the four testing periods on the ISS, MAT, RCS, and GSI. Mean squares, degrees of freedom, F ratios, and probability levels for all main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 28.

A significant difference between the scores obtained across the four testing periods, by the male participants and by the female participants who received a positive diagnosis, a negative diagnosis, or a neutral diagnosis, was not observed on (a) the ISS, (b) the MAT, (c) the RCS, or on (d) the GSI, at a significance level of $p \leq .05$.

Table 27

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Male Participants and by the Female Participants in the 3 Diagnostic Categories, on the ISS, MAT, RCS and GSI, Across the 4 Testing Sessions

		POSITIVE				NEGATIVE				NEUTRAL				MS	F	p
		Male		Female		Male		Female		Male		Female				
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.			
ISS:	1	20.00	14.25	16.40	14.22	16.57	9.38	13.86	11.84	28.17	11.58	22.83	14.99	41.3463	1.08	.3769
	2	18.47	16.90	18.33	18.78	15.14	12.54	10.57	11.15	25.50	15.39	23.67	17.60			
	3	19.37	16.12	18.13	20.66	14.29	10.36	16.57	12.73	28.50	14.98	19.50	15.36			
	4	17.63	16.74	19.57	20.05	16.43	11.50	13.14	12.46	28.50	16.56	28.00	21.18			
MAT:	1	110.00	14.25	121.70	14.27	119.00	20.16	126.00	11.45	114.70	23.64	125.80	14.99	39.8523	.47	.8272
	2	110.10	22.61	119.90	16.05	113.60	13.55	122.90	15.33	105.80	30.73	120.30	29.24			
	3	107.10	26.38	117.80	20.66	117.90	20.63	121.70	14.56	115.20	14.98	122.80	17.45			
	4	108.90	23.06	116.40	21.24	121.70	16.40	117.90	14.40	115.50	26.32	120.20	19.35			
RCS:	1	87.60	11.43	91.53	12.68	90.86	17.69	86.71	4.39	91.83	10.61	88.00	8.30	94.8383	1.11	.3582
	2	87.30	12.52	88.77	11.94	85.86	14.63	93.14	14.11	79.17	10.59	82.50	3.78			
	3	86.07	11.61	87.30	12.82	84.57	18.86	95.43	15.40	88.83	6.34	90.50	8.87			
	4	87.33	11.90	85.77	12.96	88.14	9.08	87.14	10.79	86.50	11.84	81.67	10.35			
GSI:	1	56.37	13.11	57.00	9.67	58.29	9.55	58.57	9.93	58.83	8.45	56.67	8.73	10.2105	.25	.9605
	2	50.40	10.81	50.97	10.36	54.14	10.09	53.43	9.33	56.33	14.11	54.50	11.31			
	3	49.57	15.09	54.47	12.11	52.57	7.81	56.14	9.12	50.17	6.11	56.17	11.96			
	4	49.87	15.46	52.80	11.86	52.29	12.78	51.14	9.74	52.50	17.40	56.17	13.91			

Positive n=60
Negative n=14
Neutral n=12
df 6,240

Table 28

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis VI

	MS	F	df	p
Between Contrasts:				
Sex: Multivariate TSQ		1.55	4,770	.1961
		No significant differences		
Diagnosis: Multivariate L Ratio		1.75	8,154	.0907
		No significant differences		
Sex/Diagnosis: Multivariate L Ratio		.28	8,154	.9716
		No significant differences		
Within Contrasts:				
Period: Multivariate L Ratio		3.21	12,627	.0002**
GSI	289.994	6.99	3,240	.0002**
Period x Sex: Multivariate L Ratio		1.48	12,627	.1268
MAT	181.581	2.16	3,240	.0933
GSI	85.050	2.05	3,240	.1073
Period x Diagnosis: Multivariate L Ratio		1.10	24,138	.3531
		No significant differences		
Period x Sex/Diagnosis: Multivariate L Ratio		1.07	24.138	.3875
		No significant differences		

*p ⩽ .05
**p ⩽ .01

Therefore, components (a), (b), (c), and (d) of the null Hypothesis VI were not rejected.

Significant main effects were observed on the time period variable, again suggesting that significant differences existed between the scores obtained by all participants, on the GSI, across the four testing periods, at a probability level of $p \leqslant .01$. Post-hoc test results on the means of the GSI scores obtained by the participants, using the Newman-Keuls procedure, suggest that significant differences existed between the first and second session GSI scores, the first and third session GSI scores, and the first and fourth session GSI scores (see Table 29). However, significant differences were not found between the mean GSI scores for any of the remaining sessional comparisons.

Hypothesis VII

A multivariate analysis of variance with repeated measurements was conducted to test the significance of the differences between the scores obtained across the four testing periods, on the nine subscales of the SCL-90-R, by the research participants who received a positive diagnosis, a negative diagnosis, or a neutral diagnosis. Table 30 presents a summary of the mean scores and standard deviations for the participants in each of the three diagnostic categories, on each of the nine subscales of the SCL-90-R, over the four testing periods, as well as the

Table 29

Tests on the Means of the GSI Using the Newman-Keuls Procedure:

Hypothesis VI

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	0.79	0.04	0.00		
Session 3	0.94	0.75	0.71	0.00	
Session 1	1.03	5.31*	5.27*	4.56*	0.00

*$p \leq .05$

Table 30

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Research Participants in the 3 Diagnostic Categories on the 9 SCL-90-R Subscales, Across the 4 Testing Periods

		POSITIVE		NEGATIVE		NEUTRAL		MS	F	p
		Mean	S.D.	Mean	S.D.	Mean	S.D.			
SOMATIZATION:	Session 1	49.88	12.45	51.07	10.77	50.58	7.95	29.6383	.54	.7754
	2	46.68	11.26	47.86	10.23	47.67	16.42			
	3	47.75	13.84	46.50	7.51	44.67	12.64			
	4	46.20	11.63	45.00	10.07	43.50	14.20			
OBSESSIVE-COMPULSIVE:	Session 1	57.10	12.99	58.43	11.15	56.08	8.17	43.1276	.66	.6813
	2	49.80	11.94	52.43	11.51	54.75	12.31			
	3	49.52	15.23	53.71	9.52	53.00	8.69			
	4	48.58	15.52	50.07	11.98	52.50	13.81			
INTERPERSONAL SENSITIVITY:	Session 1	57.33	12.39	57.86	9.20	59.00	9.37	52.8176	.85	.5326
	2	51.05	11.21	52.64	9.91	54.92	13.79			
	3	52.55	12.87	55.14	8.51	56.50	9.74			
	4	52.47	12.25	49.43	11.58	58.08	14.62			
DEPRESSION:	Session 1	55.77	10.47	59.71	9.32	59.08	7.66	11.4053	.20	.9766
	2	52.05	11.76	55.86	11.30	57.67	11.58			
	3	53.43	14.87	57.14	8.71	56.58	6.68			
	4	52.12	15.97	54.86	11.17	57.50	15.70			
ANXIETY:	Session 1	53.48	13.02	57.00	11.18	53.42	14.58	101.887	1.50	.1791
	2	47.70	11.31	52.79	9.04	50.58	13.49			
	3	50.77	15.08	50.79	11.83	46.08	12.14			
	4	50.25	13.26	48.43	11.41	51.08	13.35			

Positive n=60
Negative n=14
Neutral n=12
df 6,249

Table 30 (Continued)

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Research Participants in the 3 Diagnostic Categories on the 9 SCL-90-R Subscales, Across the 4 Testing Periods

		POSITIVE		NEGATIVE		NEUTRAL		MS	F	p
		Mean	S.D.	Mean	S.D.	Mean	S.D.			
HOSTILITY:	Session 1	54.35	12.89	55.14	12.23	58.08	14.83	35.4076	.49	.8174
	2	49.97	11.44	53.00	14.62	51.67	14.72			
	3	51.48	13.55	54.71	11.91	50.83	9.30			
	4	50.87	11.11	51.57	12.80	54.00	14.21			
PHOBIC ANXIETY:	Session 1	45.85	9.32	48.14	10.20	46.25	7.84	68.7616	1.33	.2437
	2	45.53	9.61	44.29	8.76	46.25	12.11			
	3	46.02	10.58	44.14	8.25	43.83	8.95			
	4	44.80	8.69	42.64	6.95	49.50	12.05			
PARANOID IDEATION:	Session 1	51.32	12.89	52.50	13.02	55.50	11.85	74.0113	1.23	.2926
	2	48.12	12.77	47.86	14.33	55.83	12.70			
	3	45.45	12.11	51.50	10.53	55.08	13.19			
	4	46.67	12.09	46.07	11.28	53.67	14.49			
PSYCHOTICISM:	Session 1	57.32	11.24	59.14	11.19	51.83	13.56	112.858	2.32	.0335*
	2	51.00	10.88	54.57	11.90	55.08	14.04			
	3	52.35	11.94	53.71	11.66	52.75	13.40			
	4	52.68	12.89	52.29	10.61	56.00	13.50			

Positive n=60
Negative n=14
Neutral n=12
df 6,249
*p $\leq$ .05

univariate within contrast mean squares, the F ratios, and the probability levels of the two-way interactions between the scores obtained by the participants in the three diagnostic categories, on the nine SCL-90-R subscales, across the four testing periods. Mean squares, degrees of freedom, F ratios, and probability levels for the main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 31.

A significant difference between the scores obtained across the four testing periods, by the participants who received a positive diagnosis, the participants who received a negative diagnosis, and the participants who received a neutral diagnosis, was not found on (a) the Somatization scale, (b) the Obsessive-Compulsive scale, (c) the Interpersonal Sensitivity scale, (d) the Depression scale, (e) the Anxiety scale, (f) the Hostility scale, (g) the Phobic Anxiety scale, or on (h) the Paranoid Ideation scale of the SCL-90-R, at a significance level of $p \leq .05$. Therefore, components (a), (b), (c), (d), (e), (f), (g), and (h) of the null Hypothesis VII were not rejected. However, a significant difference at the $p \leq .05$ level was observed on (i) the Psychoticism scale. Therefore, component (i) of the null Hypothesis VII was rejected.

Significant main effects were observed for the time period variable, again suggesting that a significant difference existed between the scores obtained by all of the research participants on the Hostility and Paranoid

Table 31

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interaction for Hypothesis VII

	MS	F	df	p
Between Contrasts:				
Diagnosis: Multivariate L Ratio		.96	18,150	.5044
Paranoid Ideation	1021.55	2.28	2,830	.1088
Within Contrasts:				
Period: Multivariate L Ratio		1.45	27,704	.0654
Somatization	298.887	5.47	3,249	.0012**
Obsessive-Compulsive	451.814	6.92	3,249	.0002**
Interpersonal Sensitivity	289.482	4.66	3,249	.0035**
Depression	120.757	2.12	3,249	.0988
Anxiety	314.545	4.63	3,249	.0036**
Hostility	200.343	2.76	3,249	.0429*
Paranoid Ideation	163.856	2.72	3,249	.0452*
Psychoticism	102.060	2.10	3,249	.1006
Period x Diagnosis: Multivariate L Ratio		1.06	54,114	.3881
Psychoticism	112.858	2.32	6,249	.0335*

*$p \leq .05$
**$p \leq .01$

Ideation scales ($p \leqslant .05$), and on the Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, and Anxiety scales of the SCL-90-R ($p \leqslant .01$).

Results of the tests on the simple main effects of the period and diagnosis factors for the Psychoticism scale suggest that the scores obtained by the participants who received a positive diagnosis differed significantly across the four testing sessions ($p \leqslant .01$), and that the scores obtained by the participants who received a negative diagnosis also differed significantly across the four testing periods, at a $p \leqslant .05$ level of significance (see Table 32). The most substantial differences appear to have occurred between the Psychoticism scores obtained by the participants in the three diagnostic categories on the first and second sessions, although not at a significant level.

Results of the post-hoc tests on the means of the Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Anxiety, Hostility, and Paranoid Ideation scales, using the Newman-Keuls procedure, suggest that significant differences existed between the first and second session scores, the first and third session scores, and the first and fourth session scores obtained by the participants on each of these measures, again concurring with the results of the previously mentioned post-hoc tests (see Tables 33 through 38). Significant differences were also identified between the mean Somatization scores

Table 32

Results of the Tests on the Simple Main Effects of Period and Diagnosis for the Psychoticism Scale of the SCL-90-R

	MS	F	df	p
Between Contrasts:				
Period x Positive	454.015	9.35	3,249	.0000**
Period x Negative	122.952	2.53	3,249	.0576*
Period x Neutral	45.611	.94	3,249	.4223
Within Contrasts:				
Period 1 x Diagnosis	194.335	1.45	2.830	.2397
Period 2 x Diagnosis	132.345	1.00	2.830	.3726
Period 3 x Diagnosis	10.668	.07	2.830	.9298
Period 4 x Diagnosis	60.295	.38	2.830	.6870

*$p \leq .05$
**$p \leq .01$

Table 33

Tests on the Means of the Somatization Scale Using the Newman-Keuls Procedure: Hypothesis VII

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.28	1.38*	0.00		
Session 3	1.53	1.49	0.11	0.00	
Session 1	1.68	4.54*	3.16*	3.05*	0.00

*p ≤ .05

Table 34

Tests on the Means of the Obsessive-Compulsive Scale Using the Newman-Keuls Procedure: Hypothesis VII

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	1.40	1.32	0.00		
Session 2	1.67	1.55	0.23	0.00	
Session 1	1.84	7.80*	6.48*	6.25*	0.00

*p ≤ .05

Table 35

Tests on the Means of the Interpersonal Sensitivity Scale Using the Newman-Keuls Procedure: Hypothesis VII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.36	0.91	0.00		
Session 3	1.63	1.67*	0.76	0.00	
Session 1	1.79	5.80*	4.89*	4.13*	0.00

*p ≤ .05

Table 36

Tests on the Means of the Anxiety Scale Using the Newman-Keuls Procedure: Hypothesis VII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.43	1.14	0.00		
Session 3	1.71	1.19	0.05	0.00	
Session 1	1.87	5.12*	3.98*	3.93*	0.00

*p ≤ .05

Table 37

Tests on the Means of the Hostility Scale Using the Newman-Keuls Procedure

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.47	0.72	0.00		
Session 3	1.77	1.22	0.50	0.00	
Session 1	1.94	4.30*	3.58*	3.08*	0.00

*p ≤ .05

Table 38

Tests on the Means of the Paranoid Ideation Scale Using the Newman-Keuls Procedure

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	1.34	0.23	0.00		
Session 2	1.61	1.60	1.37	0.00	
Session 1	1.76	4.54*	4.31*	2.94*	0.00

*p ≤ .05

obtained by the participants on session 2 and session 4, and between the mean Interpersonal Sensitivity scores obtained by the participants on session 2 and session 3 ($p \leq .05$). However, significant differences were not found between the mean scores obtained by participants on any of these dependent measures, for the remaining sessional comparisons.

Hypothesis VIII

A multivariate analysis of variance with repeated measurements was conducted to determine the significance of the differences between the scores obtained across the four testing periods, on the nine subscales of the SCL-90-R, by the male research participants and by the female research participants who received a positive diagnosis, a negative diagnosis, or a neutral diagnosis. Table 39 presents a summary of the mean scores and standard deviations for the male and for the female participants in each of the three diagnostic categories, on each of the nine SCL-90-R subscales, across the four testing sessions, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the three-way interactions between the sex of the participants, the three categories of diagnostic information received by the participants, and their scores across the four testing periods on the nine subscales of the SCL-90-R. Mean squares, degrees of freedom, F ratios, and probability

Table 39

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Male and Female Participants in the 3 Diagnostic Categories, on the 9 SCL-90-R Subscales, Over the 4 Testing Sessions

		POSITIVE				NEGATIVE				NEUTRAL				MS	F	p
		Male		Female		Male		Female		Male		Female				
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.			
SOMATIZATION	Session 1	48.00	15.05	51.77	9.04	50.57	11.03	51.57	11.36	53.17	6.59	48.00	8.92	50.1860	.92	.4787
	2	44.90	12.68	48.47	9.53	49.00	11.50	46.71	9.55	54.67	15.88	40.67	14.95			
	3	45.00	15.06	50.50	12.13	44.43	7.39	48.57	7.59	43.33	10.44	46.00	15.44			
	4	43.63	13.46	48.77	8.96	45.14	11.96	44.86	8.75	44.83	16.50	42.17	12.92			
OBSESSIVE-COMPULSIVE	Session 1	57.27	14.10	56.93	12.01	60.00	10.33	56.86	12.52	57.00	7.85	55.17	9.13	11.8852	.18	.9809
	2	50.47	12.94	49.13	11.04	51.86	11.38	53.00	12.52	53.50	14.69	56.00	10.66			
	3	46.30	17.24	52.73	12.38	50.57	10.72	56.86	7.63	50.17	5.85	55.83	10.61			
	4	47.27	17.45	49.90	13.50	49.14	13.55	51.00	11.21	50.83	13.54	54.17	15.16			
INTERPERSONAL SENSITIVITY	Session 1	56.20	12.50	58.47	12.38	55.14	11.71	60.57	5.38	58.83	6.24	59.17	12.42	32.1777	.51	.8025
	2	49.27	10.57	52.83	11.72	51.43	12.61	53.86	7.11	52.17	13.96	57.67	14.32			
	3	50.93	13.61	54.17	12.09	51.43	8.77	58.86	6.91	53.50	3.83	59.50	13.13			
	4	49.50	12.50	55.43	11.43	48.86	13.26	50.00	10.68	56.50	16.91	59.67	13.35			
DEPRESSION	Session 1	54.27	12.13	57.27	8.45	60.71	9.59	58.71	9.70	60.67	6.98	57.50	8.62	22.5999	.40	.8791
	2	52.30	13.37	51.80	10.11	59.29	10.05	52.43	12.18	56.83	6.12	58.50	8.26			
	3	50.40	17.05	56.47	11.84	56.00	9.20	58.29	8.75	54.50	3.83	58.67	8.55			
	4	50.00	18.25	54.23	13.28	56.00	9.43	53.71	13.35	54.67	21.06	60.33	8.94			
ANXIETY	Session 1	53.57	12.52	53.40	13.72	57.86	8.55	56.14	13.99	56.33	13.52	50.50	16.26	65.5321	.96	.4523
	2	48.23	10.12	47.17	12.54	54.71	7.04	50.86	10.90	54.00	11.54	47.17	15.47			
	3	50.83	15.30	50.70	15.12	49.00	10.77	52.57	13.41	42.33	11.52	49.83	12.56			
	4	50.10	13.17	50.40	13.57	50.71	9.50	46.14	13.40	50.33	15.24	51.83	12.59			

Positive: Male n=30, Female n=30
Negative: Male n=7, Female n=7
Neutral: Male n=6, Female n=6
df 6,240

Table 39 (Continued)

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Male and Female Participants in the 3 Diagnostic Categories, on the 9 SCL-90-R Subscales, Over the 4 Testing Sessions

		POSITIVE				NEGATIVE				NEUTRAL				MS	F	p
		Male		Female		Male		Female		Male		Female				
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.			
HOSTILITY	Session 1	54.70	13.49	54.00	12.49	55.43	11.54	54.86	13.80	58.67	18.04	57.50	12.55	72.3927	1.00	.4274
	2	50.73	13.09	49.20	9.67	52.43	14.64	53.57	15.76	51.83	18.84	51.50	11.04			
	3	48.93	14.95	54.03	11.70	56.00	7.28	53.43	15.82	50.67	7.92	51.00	11.30			
	4	49.97	10.89	51.77	11.40	55.43	12.41	47.71	12.89	50.67	14.84	57.33	14.05			
PHOBIC ANXIETY	Session 1	43.80	7.73	47.90	10.40	42.71	7.18	53.57	10.26	43.17	7.76	49.33	7.23	56.2716	1.10	.3633
	2	42.90	7.60	48.17	10.75	43.29	8.69	45.29	9.39	45.67	13.88	46.83	11.36			
	3	44.40	9.10	47.63	11.81	42.71	7.18	45.57	9.55	40.00	0.00	47.67	11.88			
	4	43.67	8.41	45.93	8.96	43.29	8.69	42.00	5.29	51.17	12.77	47.83	12.24			
PARANOID IDEATION	Session 1	50.90	14.44	51.73	11.37	50.29	14.89	54.71	11.59	52.67	10.86	58.33	13.11	4.3874	.07	.9986
	2	47.30	12.57	48.93	13.13	45.86	16.49	49.86	12.80	53.33	16.31	58.33	8.60			
	3	44.67	12.25	46.23	12.13	49.43	11.01	53.57	10.44	50.67	13.19	59.50	12.74			
	4	46.53	12.69	46.80	11.68	45.14	10.59	47.00	12.71	50.83	17.81	56.50	11.20			
PSYCHOTICISM	Session 1	55.27	12.69	59.37	9.34	58.43	15.97	59.86	3.89	52.83	15.88	50.83	12.24	41.8126	.88	.5133
	2	49.40	10.82	52.60	10.88	54.14	12.16	55.00	12.60	58.50	12.90	51.67	15.47			
	3	48.47	10.98	56.23	11.77	51.43	11.43	56.00	12.33	49.83	11.81	55.67	15.34			
	4	50.60	13.63	54.77	11.97	47.86	10.53	56.71	9.34	53.83	16.08	58.17	11.44			

Positive: Male n=30, Female n=30
Negative: Male n=7, Female n=7
Neutral: Male n=6, Female n=6
df 6,240

levels for all of the main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 40.

A significant difference between the scores obtained across the four testing periods, by the male participants and by the female participants who received a positive diagnosis, a negative diagnosis, or a neutral diagnosis, was not observed on (a) the Somatization scale, (b) the Obsessive-Compulsive scale, (c) the Interpersonal Sensitivity scale, (d) the Depression scale, (e) the Anxiety scale, (f) the Hostility scale, (g) the Phobic Anxiety scale, (h) the Paranoid Ideation scale, or on (i) the Psychoticism scale, of the SCL-90-R at a significance level of $p \leq .05$. Therefore, all nine components of the null Hypothesis VIII were not rejected.

Significant main effects were again observed for the time period variable, suggesting that significant differences existed between the scores obtained over the four testing periods by all participants, on the Hostility and Paranoid Ideation scales ($p \leq .05$), and on the Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, and Anxiety scales ($p \leq .01$) of the SCL-90-R. Significant two-way interactions were also observed between the sex and time period variables, suggesting that a significant difference existed between the scores obtained across the four time periods, by the male and by the female participants, on the Somatization, Phobic Anxiety, and Psychoticism

Table 40

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis VIII

	MS	F	df	p
Between Contrasts:				
SEX: Multivariate TSQ		1.08	9,720	.3901
Phobic Anxiety	611.726	3.01	1.800	.0868
DIAGNOSIS: Multivariate L Ratio		.98	18,144	.4914
	No significant differences			
SEX/DIAGNOSIS: Multivariate L Ratio		.70	18,144	.8094
	No significant differences			
Within Contrasts:				
PERIOD: Multivariate L Ratio		1.45	27,678	.0660
Somatization	298.887	5.50	3,240	.0011**
Obsessive-Compulsive	451.814	7.02	3,240	.0002**
Interpersonal Sensitivity	289.482	4.56	3,240	.0039**
Depression	120.757	2.13	3,240	.0967
Anxiety	314.545	4.61	3,240	.0037**
Hostility	200.343	2.76	3,240	.0428*
Paranoid Ideation	163.856	2.63	3,240	.0508*
Psychoticism	102.060	2.14	3,240	.0961
PERIOD X SEX: Multivariate L Ratio		1.36	27,678	.1048
Somatization	154.459	2.84	3,240	.0385*
Obsessive-Compulsive	144.910	2.25	3,240	.0831
Anxiety	142.486	2.09	3,240	.1022
Phobic Anxiety	142.265	2.78	3,240	.0418*
Psychoticism	156.796	3,28	3,240	.0215*
PERIOD X DIAGNOSIS: Multivariate L Ratio		1.06	54,108	.3968
Psychoticism	112.858	2.36	6,240	.0308*
PERIOD X SEX/DIAGNOSIS: Multivariate L Ratio		.92	54,108	.6213
	No significant differences			

*p $\leq$ .05
**p $\leq$ .01

scales of the SCL-90-R, at a probability level of $p \leq .05$. Another significant two-way interaction was found between the diagnostic and time period variables, suggesting that significant differences existed between the scores obtained by the participants in the three diagnostic categories, across the four testing sessions, on the Psychoticism scale of the SCL-90-R ($p \leq .05$).

Results of the tests on the simple main effects of the period and sex factors for the Somatization, Phobic Anxiety, and Psychoticism scales suggest that the scores of the female participants differed significantly on the Somatization scale across the four testing sessions ($p \leq .05$), and that the scores of the male participants differed significantly at a $p \leq .01$ level, on the Somatization and Psychoticism scales across the four testing periods (see Table 41). The most substantial differences appear to have occurred between the Somatization scores obtained by the males and the females on the second testing session, although not at a significant level. Differences between the Phobic Anxiety scores obtained by the male and female participants appear to have occurred on testing session 1 ($p \leq .01$), and on testing session 3 ($p \leq .10$), while the differences between the Psychoticism scores obtained by the men and the women in the study appear to have occurred on testing session 3 ($p \leq .07$), and testing session 4 ($p \leq .10$).

Results of the tests on the simple main effects of

Table 41

Results of the Tests on the Simple Main Effects of Period and Sex for the Somatization, Phobic Anxiety, and Psychoticism Scales of the SCL-90-R

	MS	F	df	p
Between Contrasts:				
Period x Female:				
Somatization	168.236	3.10	3,240	.0276*
Phobic Anxiety	117.223	2.29	3,240	.0790
Psychoticism	74.523	1.56	3,240	.1995
Period x Male:				
Somatization	285.110	5.25	3,240	.0016**
Phobic Anxiety	64.490	1.26	3,240	.2888
Psychoticism	184.333	3.86	3,240	.01008*
Within Contrasts:				
Period 1 x Sex:				
Somatization	.2333	.00	1,800	.9673
Phobic Anxiety	650.731	8.17	1,800	.0054**
Psychoticism	18.1574	.13	1,800	.7151
Period 2 x Sex:				
Somatization	235.921	1.71	1,800	.1943-
Phobic Anxiety	103.718	1.09	1,800	.2998
Psychoticism	11.240	.08	1,800	.7726
Period 3 x Sex:				
Somatization	220.973	1.33	1,800	.2516
Phobic Anxiety	276.003	2.76	1,800	.1008-
Psychoticism	481.543	3,48	1,800	.0659-
Period 4 x Sex:				
Somatization	6.937	.05	1,800	.8236
Phobic Anxiety	8.070	.10	1,800	.7546
Psychoticism	439.353	2.77	1,800	.0998-

*$p \leq .05$
**$p \leq .01$

the period and diagnosis factors for the Psychoticism scale, suggest that significant differences existed between the scores obtained across the four testing sessions for the participants who received a positive diagnosis ($p \leq .01$), and for the participants who received a negative diagnosis ($p \leq .05$) (see Table 42). The most substantial differences between the Psychoticism scores obtained by the participants in the three diagnostic categories appears to have occurred on session 1, although not at a significant level.

Post-hoc testing was not conducted on the mean scores obtained by the participants on the Somatization scale due to the confounding of these significant main effects for period, with a significant period and sex interaction. Results of the post-hoc tests on the means of the scores obtained by the participants on the Obsessive-Compulsive, Interpersonal Sensitivity, Anxiety, Hostility, and Paranoid Ideation scales, using the Newman-Keuls procedure, suggest that significant differences existed at a $p \leq .05$ level, between the first and second session scores, the first and third session scores, and the first and fourth session scores, on each of these five SCL-90-R scales (see Tables 43 through 47). Significant differences were also observed at a $p \leq .05$ level, between the third and fourth session and second and fourth session Obsessive-Compulsive scores, the second and third session Interpersonal Sensitivity scores, the second and fourth session Anxiety scores, and the second and third, and second and fourth session

Table 42

Results of the Tests on the Simple Main Effects of Period and Diagnosis for the Psychoticism Scale of the SCL-90-R

	MS	F	df	p
Between Contrasts:				
Period x Positive	454.015	9.51	3,240	0000**
Period x Negative	122.952	2.58	3,240	.0546*
Period x Neutral	45.611	.96	3,240	.4145
Within Contrasts:				
Period 1 x Diagnosis	194.335	1.44	2,800	.2440
Period 2 x Diagnosis	132.345	.99	2,800	.3762
Period 3 x Diagnosis	10.668	.08	2,800	.9259
Period 4 x Diagnosis	60.2949	.38	2,800	.6848

*$p \leq .05$

**$p \leq .01$

Table 43

Tests on the Means of the Obsessive-Compulsive Scale Using the Newman-Keuls Procedure: Hypothesis VIII

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	0.98	1.32*	0.00		
Session 2	1.18	1.55*	0.23	0.00	
Session 1	1.29	7.80*	6.48*	6.25*	0.00

*p ⩽ .05

Table 44

Tests on the Means of the Interpersonal Sensitivity Scale Using the Newman-Keuls Procedure: Hypothesis VIII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	0.97	0.91	0.00		
Session 3	1.17	1.67*	0.76	0.00	
Session 1	1.28	5.80*	4.89*	4.13*	0.00

*p ⩽ .05

Table 45

Tests on the Means of the Anxiety Scale Using the Newman-Keuls Procedure: Hypothesis VIII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.01	1.14*	0.00		
Session 3	1.21	1.19	0.05	0.00	
Session 1	1.33	5.12*	3.98*	3.93*	0.00

*$p \leq .05$

Table 46

Tests on the Means of the Hostility Scale Using the Newman-Keuls Procedure: Hypothesis VIII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.04	0.72	0.00		
Session 3	1.25	1.22	0.50	0.00	
Session 1	1.37	4.30*	3.58*	3.08*	0.00

*$p \leq .05$

Table 47

Tests on the Means of the Paranoid Ideation Scale Using the Newman-Keuls Procedure: Hypothesis VIII

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	0.97	0.23	0.00		
Session 2	1.16	1.60*	1.37*	0.00	
Session 1	1.27	4.54*	4.31*	2.94*	0.00

*$p \leq .05$

Paranoid Ideation scores obtained by the research participants. However, significant differences were not apparent for any of the remaining sessional comparisons.

Hypothesis IX

A multivariate analysis of variance with repeated measurements was conducted to determine the significance of the differences between the scores obtained over the four testing sessions on the ISS, the MAT, the RCS, and the GSI, by those research participants who were identified as having an organic fertility problem and those participants who were not identified as having an organic fertility problem. Table 48 presents a summary of the mean scores and standard deviations obtained on each of the four test instruments, by the participants who were identified as having an organic fertility problem and those who were not, across the four testing periods, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the interactions between the diagnostic information received by the participants regarding the organic etiology of their fertility problem, and their scores on the four instruments, across the four testing sessions. Mean squares, degrees of freedom, F ratios, and probability levels for the main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 49.

A significant difference between the scores obtained

Table 48

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants Who Were Identified as Having an Organic Fertility Problem and Those Who Were Not, on the ISS, MAT, RCS and GSI, Across the 4 Testing Sessions

		IDENTIFIED ORGANIC PROBLEM		NO IDENTIFIED ORGANIC PROBLEM		MS	F	p
		Mean	S.D.	Mean	S.D.			
ISS:	Session 1	15.85	13.18	21.24	13.79	59.7498	1.56	.1997
	2	17.20	17.57	19.37	16.16			
	3	17.30	18.77	20.37	15.38			
	4	18.47	18.06	20.07	17.46			
MAT:	Session 1	121.50	15.79	114.20	19.13	28.3388	.34	.7989
	2	119.00	16.34	112.00	23.51			
	3	117.70	21.29	111.70	23.63			
	4	117.10	19.82	112.30	22.39			
RCS:	Session 1	91.02	12.80	88.15	10.68	10.1560	.12	.9507
	2	88.82	12.52	85.91	11.88			
	3	88.50	14.70	86.89	10.51			
	4	87.35	12.20	85.54	11.29			
GSI:	Session 1	58.47	10.50	55.93	10.74	74.1610	1.82	.1435
	2	51.52	10.78	52.13	10.57			
	3	54.53	11.74	50.85	12.94			
	4	53.27	13.22	50.54	13.61			

IDENTIFIED n=40
NOT IDENTIFIED n=46
df 3,252

Table 49

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis IX

	MS	F	df	p
Between Contrasts:				
Etiology: Multivariate TSQ		1.98	4,810	.1058
		No significant differences		
Within Contrasts:				
Period: Multivariate L Ratio		4.55	12,659	.0000**
MAT	181.812	2.16	3,252	.0934
GSI	561.432	13.80	3,252	.0000**
Period x Etiology: Multivariate L Ratio		.95	12,659	.5010
		No significant differences		

*p $\leq$ .05
**p $\leq$ .01

over the four testing sessions, by the participants who were identified as having an organic fertility problem and the participants who were not identified as having an organic fertility problem, was not apparent on (a) the ISS, (b) the MAT, (c) the RCS, or on (d) the GSI, at a significance level of $p \leq .05$. Therefore, components (a), (b), (c), and (d) of the null Hypothesis IX were not rejected.

Significant main effects were again found for the time period variable, suggesting that the scores obtained by all of the participants on the GSI differed significantly across the four testing sessions, at a probability level of $p \leq .01$. Results of the post-hoc tests on the means of the GSI using the Newman-Keuls procedure suggest that significant differences existed between the participants' first and second session GSI scores, first and third session GSI scores, and their first and fourth session GSI scores, at a significance level of $p \leq .05$ (see Table 50). However, significant differences were not found between the mean GSI scores for any of the remaining sessional comparisons.

Hypothesis X

A multivariate analysis of variance with repeated measurements was conducted to determine the significance of the differences between the scores obtained across the four testing sessions, on the nine subscales of the SCL-

Table 50

Tests on the Means of the GSI Using the Newman-Keuls Procedure:

Hypothesis IX

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.35	0.04	0.00		
Session 3	1.62	0.75	0.71	0.00	
Session 1	1.78	5.31*	5.27*	4.56*	0.00

*$p \leq .05$

90-R, by the research participants who were identified as having an organic fertility problem and the participants who were not identified as having an organic fertility problem. Table 51 presents a summary of the mean scores and standard deviations obtained on each of the nine subscales, by the participants who were identified as having an organic fertility problem and those who were not, across the four testing sessions, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the interactions between the diagnostic information received by the participants regarding the organic etiology of their fertility problem and their scores on the nine SCL-90-R subscales, across the four testing sessions. Mean squares, degrees of freedom, F ratios, and probability levels for the main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 52.

A significant difference between the scores obtained across the four testing periods, by the participants who were identified as having an organic fertility problem and the participants who were not identified as having an organic fertility problem was not observed on (a) the Somatization scale, (c) the Interpersonal Sensitivity scale, (e) the Anxiety scale, (f) the Hostility scale, (g) the Phobic Anxiety scale, (h) the Paranoid Ideation scale, or on (i) the Psychoticism scale of the SCL-90-R, at a significance level of $p \leq .05$. Therefore, components

Table 51

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants Who Were Identified as Having an Organic Fertility Problem and Those Who Were Not, on the 9 SCL-90-R Subscales, Across the 4 Testing Periods

		IDENTIFIED ORGANIC PROBLEM		NO IDENTIFIED ORGANIC PROBLEM		MS	F	p
		Mean	S.D.	Mean	S.D.			
SOMATIZATION:	Session 1	52.50	9.549	48.15	12.830	14.3617	.26	.8516
	2	48.50	9.912	45.72	13.200			
	3	49.45	12.370	45.09	12.920			
	4	48.05	10.250	43.52	12.520			
OBSESSIVE-COMPULSIVE:	Session 1	58.52	11.920	56.00	12.170	184.8710	2.92	.0346*
	2	49.53	11.340	52.13	12.410			
	3	52.67	11.720	48.96	15.140			
	4	51.15	13.840	47.83	15.380			
INTERPERSONAL SENSITIVITY:	Session 1	59.57	12.880	55.98	9.896	19.8654	.32	.8122
	2	52.58	11.640	51.22	11.170			
	3	54.60	11.610	52.59	12.130			
	4	54.22	12.150	51.48	12.930			
DEPRESSION:	Session 1	57.97	8.705	55.91	11.000	167.2470	3.06	.0289*
	2	52.28	10.700	54.48	12.590			
	3	56.75	11.270	52.50	14.460			
	4	54.90	14.05	51.93	16.200			
ANXIETY:	Session 1	54.77	12.67	53.41	13.170	24.8918	.36	.7826
	2	48.57	12.26	49.24	10.610			
	3	51.07	15.13	49.28	13.410			
	4	50.65	14.22	49.57	11.700			

IDENTIFIED n=40
NOT IDENTIFIED n=46
df 3,252
*p ≤ .05

Table 51 (Continued)

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants Who Were Identified as Having an Organic Fertility Problem and Those Who Were Not, on the 9 SCL-90-R Subscales, Across the 4 Testing Periods

		IDENTIFIED ORGANIC PROBLEM		NO IDENTIFIED ORGANIC PROBLEM		MS	F	P
		Mean	S.D.	Mean	S.D.			
HOSTILITY:	Session 1	55.42	12.340	54.63	13.620	47.6707	.66	.5763
	2	50.53	11.870	50.85	12.910			
	3	53.57	12.250	50.48	13.090			
	4	51.57	12.300	51.28	11.390			
PHOBIC ANXIETY:	Session 1	48.35	10.350	44.48	7.768	61.0566	1.18	.3197
	2	47.35	10.620	43.76	8.700			
	3	45.72	10.720	45.13	9.375			
	4	45.67	9.197	44.61	9.042			
PARANOID IDEATION:	Session 1	54.25	13.060	50.22	12.230	95.7467	1.59	.1922
	2	48.75	14.470	49.50	12.030			
	3	47.87	12.330	47.70	12.680			
	4	47.70	11.740	47.41	13.120			
PSYCHOTICISM:	Session 1	59.80	10.720	54.28	11.880	117.979	2.39	.0689
	2	52.57	11.650	51.78	11.500			
	3	55.75	11.960	49.91	11.420			
	4	54.77	12.190	51.61	12.810			

IDENTIFIED n=40
NOT IDENTIFIED n=46
df 3,252

Table 52

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis X

	MS	F	df	p
Between Contrasts:				
Etiology: Multivariate TSQ		1.31	9,760	.2446
Somatization	1373.030	3.44	1,840	.0674
Psychoticism	1254.250	3.07	1,840	.0833
Within Contrasts:				
Period: Multivariate L Ratio		2.74	27,713	.0000**
Somatization	315.850	5.80	3,252	.0008**
Obsessive-Compulsive	1048.130	16.56	3,252	.0000**
Interpersonal Sensitivity	575.377	9.22	3,252	.0000**
Depression	239.340	4.38	3,252	.0050**
Anxiety	436.384	6.30	3,252	.0004**
Hostility	310.306	4.31	3,252	.0055**
Paranoid Ideation	396.778	6.59	3,252	.0003**
Psychoticism	411.979	8.36	3,252	.0000**
Period x Etiology: Multivariate L Ratio		1.22	27,713	.2034
Obsessive-Compulsive	184.871	2.92	3,252	.0346*
Depression	167.247	3.06	3,252	.0289*
Psychoticism	117.979	2.39	3,252	.0689

*p $\leq$ .05
**p $\leq$ .01

(a), (c), (e), (f), (g), (h), and (i) of the null Hypothesis X were not rejected. However, a significant difference was found between the scores obtained across the four testing sessions, by these two groups of participants, on (b) the Obsessive-Compulsive scale, and (d) the Depression scale of the SCL-90-R, at a $p \leq .05$ level of significance. Therefore, components (b) and (d) of the null Hypothesis X were rejected.

Significant main effects were observed for the time period variable, suggesting that significant differences existed between the scores obtained by all of the research participants, across the four time periods, on the Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Paranoid Ideation, and Psychoticism scales of the SCL-90-R, at a significance level of $p \leq .01$.

Results of the tests on the simple main effects of period and etiology for the Obsessive-Compulsive and Depression scales suggest that the scores obtained by the participants who were identified as having an organic fertility problem differed significantly across the four testing sessions ($p \leq .01$), and that the scores obtained by the participants who were not identified as having an organic fertility problem differed significantly across the four testing periods, at a $p \leq .01$ level of significance (see Table 53). The most substantial differences between the Depression scores obtained by the participants in the two

Table 53

Results of the Tests on the Simple Main Effects of Period and Etiology for the Obsessive-Compulsive and Depression Scales of the SCL-90-R

	MS	F	df	p
Between Contrasts:				
Period x Identified:				
Obsessive-Compulsive	615.006	9.72	3,252	.0000**
Depression	245.950	4.50	3,252	.0043**
Period x Not Identified:				
Obsessive-Compulsive	618.225	9.77	3,252	.0000**
Depression	154.239	2.82	3,252	.0395*
Within Contrasts:				
Period 1 x Etiology:				
Obsessive-Compulsive	136.409	.94	1,840	.3353
Depression	90.966	.91	1,840	.3429
Period 2 x Etiology:				
Obsessive-Compulsive	145.238	1.02	1,840	.3150
Depression	103.861	.75	1,840	.3882
Period 3 x Etiology:				
Obsessive-Compulsive	295.835	1.59	1,840	.2113
Depression	386.453	2.26	1,840	.1364
Period 4 x Etiology:				
Obsessive-Compulsive	236.384	1.10	1,840	.2981
Depression	188.119	.81	1,840	.3708

*$p \leqslant .05$

**$p \leqslant .01$

etiological categories appear to have occurred on the third testing session, while the most substantial differences between the Obsessive-Compulsive scores obtained by the participants in the two etiological categories appear to have occurred on the third and fourth testing sessions, although not at a significant level.

Post-hoc tests were not conducted on the Obsessive-Compulsive or Depression scales, due to the confounding of these significant main effects for period, with a significant period by etiology interaction. Results of the post-hoc tests on the means of the scores on the Somatization, Interpersonal Sensitivity, Anxiety, Hostility, Paranoid Ideation, and Psychoticism scales, using the Newman-Keuls procedure, suggest that significant differences at a $p \leqslant .05$ level, existed between the first and second session scores, the first and third session scores and the first and fourth session scores, obtained by the participants on each of these SCL-90-R scales (see Tables 54 through 59). However, significant differences were not observed between any of the remaining sessional comparisons.

Hypothesis XI

A multivariate analysis of variance with repeated measurements was conducted to determine the significance of the differences between the scores obtained across the four testing periods, on the ISS, the MAT, the RCS, and

Table 54

Tests on the Means of the Somatization Scale Using the Newman-Keuls Procedure: Hypothesis X

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.56	1.38	0.00		
Session 3	1.87	1.49	0.11	0.00	
Session 1	2.05	4.54*	3.16*	3.05*	0.00

*$p \leq .05$

Table 55

Tests on the Means of the Interpersonal Sensitivity Scale Using the Newman-Keuls Procedure: Hypothesis X

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.67	0.91	0.00		
Session 3	2.01	1.67	0.76	0.00	
Session 1	2.20	5.80*	4.89*	4.13*	0.00

*$p \leq .05$

Table 56

Tests on the Means of the Anxiety Scale Using the Newman-Keuls

Procedure: Hypothesis X

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.76	1.14	0.00		
Session 3	2.11	1.19	0.05	0.00	
Session 1	2.32	5.12*	3.98*	3.93*	0.00

*p ≤ .05

Table 57

Tests on the Means of the Hostility Scale Using the Newman-Keuls

Procedure: Hypothesis X

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.80	0.72	0.00		
Session 3	2.15	1.22	0.50	0.00	
Session 1	2.36	4.30*	3.58*	3.08*	0.00

*p ≤ .05

Table 58

Tests on the Means of the Paranoid Ideation Scale Using the Newman-Keuls Procedure: Hypothesis X

	Critical Values	Session 4	Session 3	Session 2	Session 1
Session 4	0.00	0.00			
Session 3	1.64	0.23	0.00		
Session 2	1.97	1.60	1.37	0.00	
Session 1	2.16	4.54*	4.31*	2.94*	0.00

*p ≤ .05

Table 59

Tests on the Means of the Psychoticism Scale Using the Newman-Keuls Procedure: Hypothesis X

	Critical Values	Session 2	Session 3	Session 4	Session 1
Session 2	0.00	0.00			
Session 3	1.49	0.48	0.00		
Session 4	1.78	0.93	0.45	0.00	
Session 1	1.95	4.70*	4.22*	3.77*	0.00

*p ≤ .05

the GSI, by those participants who had been attempting to conceive for a period of <2 years, ⩾2<4 years, ⩾4<6 years, or ⩾6 years respectively, prior to attending the Fertility Clinic. Table 60 presents a summary of the mean scores and standard deviations obtained by the participants in each of the four pre-clinic time interval categories, on the four testing instruments over the four testing periods, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the interactions between the scores obtained by the participants in each of the four pre-clinic time interval categories, on the ISS, the MAT, the RCS, and the GSI, across the four testing periods. Mean squares, F ratios, degrees of freedom, and probability levels for the main effects and interactions which reached a significance level of $p \leqslant .10$ are presented in Table 61.

A significant difference between the scores obtained by the participants who had been attempting to conceive for <2 years, ⩾2<4 years, ⩾4<6 years, or ⩾6 years respectively, was not observed across the four testing periods on (a) the ISS, (b) the MAT, (c) the RCS, or on (d) the GSI, at a significance level of $p \leqslant .05$. Therefore, components (a), (b), (c), and (d) of the null Hypothesis XI were not rejected. A significant main effect was observed for the time period variable, again suggesting that a significant difference existed between the scores obtained by all participants across the four testing periods, on the GSI ($p \leqslant .01$).

Table 60

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants in the 4 Pre-clinic Time Interval Categories, on the ISS, MAT, RCS and GSI, Across the 4 Testing Sessions

		< 2 YEARS		⩾ 2 < 4 YEARS		⩾ 4 < 6 YEARS		⩾ 6 YEARS				
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	MS	F	p
ISS:	Session 1	17.39	15.57	18.96	12.92	16.50	10.46	21.33	16.71	15.7213	.40	.9348
	2	18.50	19.74	19.06	16.14	14.50	9.77	17.92	19.59			
	3	19.39	19.31	19.25	16.47	16.25	12.53	18.83	19.87			
	4	19.17	20.33	19.85	17.50	17.50	11.94	18.67	19.16			
MAT:	Session 1	122.70	11.09	114.20	20.84	124.50	14.22	118.40	16.71	36.9967	.43	.9160
	2	117.60	17.14	112.70	22.51	118.90	11.68	119.50	23.04			
	3	117.80	19.03	112.00	24.53	121.00	13.18	115.60	25.33			
	4	116.90	16.03	112.10	22.71	117.90	17.49	118.80	25.09			
RCS:	Session 1	90.33	12.73	89.21	12.05	93.00	13.42	87.00	7.79	52.6411	.60	.7975
	2	83.89	9.67	87.90	13.61	88.87	8.77	88.75	11.84			
	3	87.50	13.43	87.83	14.07	88.62	9.32	86.42	6.39			
	4	85.11	11.60	87.17	13.34	83.88	6.18	86.83	7.28			
GSI:	Session 1	54.89	11.37	58.31	7.75	55.50	12.31	56.75	17.49	60.0672	1.49	.1529
	2	50.39	12.41	52.48	9.59	56.50	11.60	48.42	10.96			
	3	50.94	16.95	53.85	11.36	55.50	9.30	47.83	10.35			
	4	47.78	14.25	54.23	13.56	55.25	11.23	45.92	10.65			

< 2 YRS.: n=18
⩾ 2 < 4: n=48
⩾ 4 < 6: n=8
⩾ 6 YRS.: n=12
df 9,246

Table 61

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis XI

	MS	F	df	p
Between Contrasts:				
Years Trying: Multivariate L Ratio		.68	12,209	.7739
	No significant differences			
Within Contrasts:				
Period: Multivariate L Ratio		3.25	12,643	.0001**
GSI	337.856	8.37	3,246	.0000**
Period x Trying: Multivariate L Ratio		.66	36,210	.9289
	No significant differences			

*p ⩽ .05
**p ⩽ .01

Results of the post-hoc tests on the means of the GSI scores, using the Newman-Keuls procedure, suggest that significant differences existed at a $p \leq .05$ level between the session 1 and session 2 GSI scores, the session 1 and session 3 GSI scores, and the session 1 and session 4 GSI scores, obtained by the research participants (see Table 62). However, significant differences were not observed between any of the remaining GSI sessional comparisons.

Hypothesis XII

To test Hypothesis XII, a multivariate analysis of variance with repeated measurements was conducted on the scores obtained on the nine subscales of the SCL-90-R over the four testing sessions, by those participants who had been attempting to conceive for a period of <2 years, ⩾2<4 years, ⩾4<6 years, or ⩾6 years respectively, prior to their attendance at the Fertility Clinic. Table 63 presents a summary of the mean scores and standard deviations obtained on each of the nine subscales over each of the four testing sessions for the participants in the four time interval categories, as well as the univariate within contrast mean squares, the F ratios, and the probability levels of the interactions between the scores obtained by the participants in the four pre-clinic time interval categories, over the four testing sessions. Mean squares, degrees of freedom, F ratios, and probability levels for the main effects and interactions which reached a significance level of $p \leq .10$ are presented in Table 64.

Table 62

Tests on the Means of the GSI Using the Newman-Keuls Procedure:

Hypothesis XI

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	0.95	.04	0.00		
Session 3	1.14	.75	.71	0.00	
Session 1	1.25	5.31*	5.27*	4.56*	0.00

*$p \leq .05$

Table 63

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants in the 4 Pre-clinic Time Interval Categories, on the 9 SCL-90-R Subscales, Across the 4 Testing Periods

		< 2 YEARS		⩾ 2 < 4 YRS.		⩾ 4 < 6 YRS.		⩾ 6 YEARS				
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	MS	F	p
SOMATIZATION:	Session 1	47.44	11.86	50.63	9.60	50.00	14.96	52.58	16.15	71.541	1.34	.2166
	2	42.83	10.92	47.27	12.09	54.25	9.21	47.42	12.09			
	3	47.44	15.78	46.85	12.65	51.62	5.68	44.67	12.30			
	4	44.56	10.31	46.10	13.00	47.13	8.99	44.33	10.48			
OBSESSIVE-COMPULSIVE:	Session 1	56.11	13.96	58.77	9.00	51.38	15.01	56.25	17.11	121.572	1.94	.0470*
	2	48.11	13.55	51.75	11.37	55.00	11.10	49.08	12.35			
	3	48.06	16.43	52.56	13.07	53.63	11.72	45.17	12.26			
	4	45.39	14.28	51.85	15.04	54.63	11.07	41.92	13.24			
INTERPERSONAL SENSITIVITY:	Session 1	57.67	15.38	58.31	7.01	57.50	14.16	55.08	17.36	22.735	.36	.9534
	2	50.28	14.03	52.67	10.44	55.75	11.06	48.33	10.73			
	3	53.06	15.82	54.21	11.21	54.63	9.87	50.75	9.47			
	4	50.00	14.66	54.42	12.68	55.12	10.15	48.67	9.52			
DEPRESSION:	Session 1	55.06	13.02	57.94	8.28	56.37	13.14	55.67	9.76	75.063	1.36	.2083
	2	54.00	14.88	54.06	9.73	58.37	10.43	46.92	13.47			
	3	51.39	17.94	56.42	11.56	56.88	9.83	49.75	12.20			
	4	48.50	17.49	55.56	14.94	57.50	12.46	48.75	13.09			
ANXIETY:	Session 1	54.78	13.21	54.48	11.06	52.00	15.88	52.58	17.98	95.255	1.40	.1865
	2	49.89	12.01	48.29	11.56	54.75	12.15	46.17	8.41			
	3	51.89	16.58	50.56	13.88	52.00	14.46	44.42	11.33			
	4	47.50	13.24	51.90	13.08	54.87	11.66	43.42	10.01			

< 2 YRS.: n=18
⩾ 2 < 4: n=48
⩾ 4 < 6: n=8
⩾ 6 YRS.: n=12
df 9,246
*p ⩽ .05

Table 63 (Continued)

Means, Standard Deviations, F Ratios and Probability Levels of the Scores Obtained by the Participants in the 4 Pre-clinic Time Interval Categories, on the 9 SCL-90-R Subscales, Across the 4 Testing Periods

		< 2 YEARS		⩾ 2 < 4 YRS.		⩾ 4 < 6 YRS.		⩾ 6 YEARS				
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	MS	F	p
HOSTILITY:	Session 1	54.06	11.78	55.52	12.72	50.37	14.55	57.42	15.35	182.009	2.69	.0054**
	2	51.78	13.21	50.12	12.03	57.63	12.87	46.75	11.53			
	3	51.33	14.97	52.63	12.89	55.37	9.23	47.67	10.47			
	4	46.44	12.73	53.63	11.28	57.25	10.89	46.17	8.97			
PHOBIC ANXIETY:	Session 1	44.89	9.74	47.19	9.40	44.12	7.75	46.17	9.11	61.752	1.19	.2990
	2	43.94	9.14	45.29	9.85	47.50	10.72	46.83	10.45			
	3	46.28	10.91	45.63	10.33	47.87	10.92	41.58	5.49			
	4	43.56	8.42	46.83	10.12	44.12	7.75	41.17	4.04			
PARANOID IDEATION:	Session 1	47.11	14.38	54.04	10.28	49.50	17.04	53.50	15.11	83.049	1.39	.1936
	2	47.78	13.87	49.10	12.44	53.50	17.40	48.50	12.89			
	3	46.44	13.25	48.19	12.48	51.75	12.29	45.50	12.00			
	4	46.17	12.94	47.71	12.66	53.37	12.39	45.08	10.83			
PSYCHOTICISM:	Session 1	52.44	13.07	58.00	9.84	61.25	12.52	55.92	14.63	42.524	.84	.5758
	2	51.83	11.27	52.48	11.81	57.00	13.11	48.08	9.27			
	3	51.94	14.06	53.44	11.98	57.25	11.05	47.33	7.86			
	4	51.11	13.27	54.58	13.27	55.87	10.09	48.17	8.96			

< 2 YRS.: n=18
⩾ 2 < 4: n=48
⩾ 4 < 6: n=8
⩾ 6 YRS.: n=12
df 9,246
**p ⩽ .01

Table 64

Mean Squares, F Ratios and Probability Levels of the Main Effects and Interactions for Hypothesis XII

	MS	F	df	p
Between Contrasts:				
Yrs. Trying: Multivariate L Ratio		.60	27,217	.9426
	No significant differences			
Within Contrasts:				
Period: Multivariate L Ratio		1.67	27,696	.0185**
Somatization	201.959	3.78	3,246	.0111**
Obsessive-Compulsive	543.933	8.68	3,246	.0000**
Interpersonal Sensitivity	346.568	5.47	3,246	.0012**
Depression	144.292	2.61	3,246	.0522*
Anxiety	206.596	3.05	3,246	.0294*
Psychoticism	281.906	5.60	3,246	.0010**
Period x Trying: Multivariate L Ratio		1.18	81,168	.1831
Obsessive-Compulsive	121.572	1.94	9,246	.0470*
Hostility	182.009	2.69	9,246	.0054**

*$p \leq .05$

**$p \leq .01$

A significant difference between the scores obtained by those participants who had been attempting to conceive for <2 years, ⩾2<4 years, ⩾4<6 years, or ⩾6 years respectively, was not found over the four testing sessions, on (a) the Somatization scale, (c) the Interpersonal Sensitivity scale, (d) the Depression scale, (e) the Anxiety scale, (g) the Phobic Anxiety scale, (h) the Paranoid Ideation scale, or on (i) the Psychoticism scale of the SCL-90-R, at a $p \leqslant .05$ level of significance. Therefore, components (a), (c), (d), (e), (g), (h), and (i) of the null Hypothesis XII were not rejected. However, a significant difference was observed between the scores obtained by the participants in the four pre-clinic time interval categories, across the four testing periods, on (b) the Obsessive-Compulsive scale at a $p \leqslant .05$ level of significance, and on (f) the Hostility scale, at a $p \leqslant .01$ level of significance. Therefore, components (b) and (f) of the null Hypothesis XII were rejected.

Significant main effects were observed on the time period variable, again suggesting that significant differences existed between the scores obtained by all of the research participants, across the four testing periods, on the Anxiety and Depression scales ($p \leqslant .05$), and on the Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, and Psychoticism scales of the SCL-90-R, at a significance level of $p < .01$.

Results of the tests on the simple main effects of period and etiology suggest that the scores obtained by

the participants who had been trying to conceive for <2 years, and the scores of those who had been trying to conceive for ⩾2<4 years, differed significantly across the four testing sessions on the Obsessive-Compulsive scale ($p \leqslant .01$), and on the Hostility scale ($p \leqslant .05$) (see Table 65). The scores obtained by the participants who had been attempting to conceive for ⩾6 years also differed significantly across the four testing periods on the Obsessive-Compulsive and Hostility scales ($p \leqslant .01$). The most substantial differences appear to have occurred on the fourth testing session, between the Obsessive-Compulsive scores ($p \leqslant .07$) and the Hostility scores ($p \leqslant .05$) obtained by the participants in the four pre-clinic time interval categories.

Post-hoc tests were not conducted for the Obsessive-Compulsive scale, due to the confounding of this significant main effect by a significant period by number of years trying interaction. Results of the post-hoc tests on the means of the scores obtained by the participants on the Somatization, Interpersonal Sensitivity, Depression, Anxiety, and Psychoticism scales, using the Newman-Keuls procedure, suggest again that significant differences existed at a $p \leqslant .05$ level, between the session 1 and session 2 scores, the session 1 and session 3 scores, and the session 1 and session 4 scores, obtained by the participants on each of these scales (see Tables 66 through 70). Significant differences were also apparent between the session 2 and

Table 65

Results of the Tests on the Simple Main Effects of Period and Years Trying on the Obsessive-Compulsive and Hostility Scales of the SCL-90-R

	MS	F	df	p
Between Contrasts:				
Period x <2 Yrs. Trying:				
Obsessive-Compulsive	387.574	6.19	3,246	.0005**
Hostility	184.606	2.73	3,246	.0447*
Period x ≥ 2 < 4 Yrs.:				
Obsessive-Compulsive	547.394	8.74	3,246	.0000**
Hostility	242.380	3.58	3,246	.0145*
Period x ≥ 4 < 6 Yrs.:				
Obsessive Compulsive	21.198	.34	3,246	.7976
Hostility	89.031	1.31	3,246	.2701
Period x ≥ 6 Yrs.:				
Obsessive-Compulsive	456.910	7.29	3,246	.0001**
Hostility	338.833	5.00	3,246	.0022**
Within Contrasts:				
Period 1 x Yrs. Trying:				
Obsessive-Compulsive	140.667	.97	3,820	.4119
Hostility	90.095	.53	3,820	.6655
Period 2 x Yrs. Trying:				
Obsessive-Compulsive	116.245	.81	3,820	.4908
Hostility	202.551	1.34	3,820	.2670
Period 3 x Yrs. Trying:				
Obsessive-Compulsive	242.742	1.31	3,820	.2778
Hostility	114.213	.70	3,820	.5561
Period 4 x Yrs. Trying:				
Obsessive-Compulsive	489.681	2.38	3,820	.0757
Hostility	427.356	3.35	3,820	.0229*

*p ≤ .05
**p ≤ .01

Table 66

Tests on the Means of the Somatization Scale Using the Newman-Keuls Procedure: Hypothesis XII

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.10	1.38*	0.00		
Session 3	1.31	1.49*	0.11	0.00	
Session 1	1.44	4.54*	3.16*	3.05*	0.00

*p ≤ .05

Table 67

Tests on the Means of the Interpersonal Sensitivity Scale Using the Newman-Keuls Procedure: Hypothesis XII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.19	0.91	0.00		
Session 3	1.43	1.67*	0.76	0.00	
Session 1	1.57	5.80*	4.89*	4.13*	0.00

*p ≤ .05

Table 68

Tests on the Means of the Depression Scale Using the Newman-Keuls Procedure: Hypothesis XII

	Critical Values	Session 4	Session 2	Session 3	Session 1
Session 4	0.00	0.00			
Session 2	1.11	0.14	0.00		
Session 3	1.34	1.17	1.03	0.00	
Session 1	1.46	3.56*	3.42*	2.39*	0.00

*$p \leq .05$

Table 69

Tests on the Means of the Anxiety Scale Using the Newman-Keuls Procedure: Hypothesis XII

	Critical Values	Session 2	Session 4	Session 3	Session 1
Session 2	0.00	0.00			
Session 4	1.23	1.14	0.00		
Session 3	1.48	1.19	0.05	0.00	
Session 1	1.62	5.12*	3.98*	3.93*	0.00

*$p \leq .05$

Table 70

Tests on the Means of the Psychoticism Scale Using the Newman-Keuls Procedure: Hypothesis XII

	Critical Values	Session 2	Session 3	Session 4	Session 1
Session 2	0.00	0.00			
Session 3	1.06	0.48	0.00		
Session 4	1.27	0.93	0.45	0.00	
Session 1	1.40	4.70*	4.22*	3.77*	0.00

* p .05

session 4, and the session 3 and session 4 Somatization scores ($p \leq .05$), and between the session 2 and session 3 Interpersonal Sensitivity scores ($p \leq .05$), obtained by the research participants. However, significant differences were not found between any of the remaining sessional comparisons.

Supplementary Information

At the conclusion of the fourth and final testing session, participants were asked to complete the Life Experiences Survey (LES), for the purpose of evaluating the events which occurred in the lives of the men and women in the study, other than the infertility experience itself, which may have impacted on their relationships and/or psychological distress levels, during the approximately six months when they were involved in the study. Table 71 presents the means, standard deviations and range of positive and negative LES scores obtained by the research participants for the six-month time period prior to the termination of their participation in the study. A review of these data indicates relatively low life event scores for the six-month period during which participants were involved in the study, with the mean positive score of 3.17 being somewhat higher than the mean negative score of 2.19. However, the range of scores was observed to be slightly greater in the negative events category (0-19), than the range of scores in the positive events category

Table 71

Six-Month LES Scores for the Participants Who Completed the Study

	Mean	S.D.	Range
Negative	2.198	3.154	0-19
Positive	3.174	3.850	0-15

n=86

(0-15).

Participants were also asked, at the conclusion of the study, to complete the experimenter-generated Personal Impressions Questionnaire (PIQ), for the purpose of evaluating the subjective impressions of the men and women in the study, regarding the need for, nature, and timing of the provision of psychological services in the area of infertility. Table 72 presents a summary of the frequency of responses made by the participants in the study, for each of the four PIQ questions and for the available responses.

Ninety-five percent of the men and 97.7% of the women indicated that there is a need for the provision of psychological services in the area of infertility, with 53.5% of the men and 72.1% of the women suggesting that they personally would have availed themselves of such services had the opportunity been provided. Being seen as a couple in counselling was the preferred choice of 75.5% of the men and 49.1% of the women, with 10.2% of the men and 28.8% of the women preferring individual counselling, 12.2% of the men and 11.9% of the women preferring to be seen in a group with other infertile couples, with 8.5% of the women preferring to be seen in a group with other infertile women, and with 2.0% of the men and 1.7% of the women preferring to be seen in a group with other infertile men and women. Thirty percent of the men and 19% of the women in the study indicated that the provision

Table 72

PIQ Responses of the Men and Women Who Completed the Study

	Men	Women	Both
1. Based upon your infertility experience do you believe that there is a need for psychological services in this area?			
YES	95.3%	97.7%	96.5%
NO	4.7	2.3	3.5
2. If YES, at what point during the infertility investigation do you feel the provision of psychological services would be most helpful?			
PRE-DIAGNOSIS	13.5%	20.6%	17.4%
DURING MEDICAL TESTING	3.8	11.1	7.8
IMMEDIATELY FOLLOWING DIAGNOSIS	30.8	19.0	24.3
SEVERAL WEEKS AFTER DIAGNOSIS	23.1	12.7	17.4
DURING TREATMENT	1.9	15.9	9.6
ALL OF THE ABOVE	26.9	20.6	23.5
3. If you were to have sought the aid of a psychologist for your fertility related concerns, would you have preferred to have been seen:			
INDIVIDUALLY	10.2%	28.8%	20.4%
AS A COUPLE	75.5	49.1	61.1
IN A GROUP WITH OTHER COUPLES	12.2	11.9	12.0
IN A SAME SEX GROUP	0	8.5	4.6
IN A MIXED SEX GROUP	2.0	1.7	1.9
4. If you had been provided with the opportunity to receive psychological assistance at any point during your infertility investigation, would you have availed yourself of these services?			
YES	53.5%	72.1%	62.8%
NO	46.5	27.9	37.2

Male n=43

Female n=43

of psychological services would be most helpful immediately following diagnosis, with 26.9% of the men and 20.6% of the women suggesting psychological intervention throughout the entire medical procedure, 13.5% of the males and 20.6% of the females indicating the provision of psychological services would be most advantageous at the outset of the medical workup, 23.1% of the men and 12.7% of the women suggesting intervention several weeks following receipt of a diagnosis, 3.8% of the men and 11.1% of the women feeling that psychological services would be most beneficial during medical testing, and with 1.9% of the men and 15.9% of the women suggesting that the provision of psychological services during the treatment phase of the investigation would be most helpful.

CHAPTER FIVE

DISCUSSION

The present chapter will include a restatement of the purpose of the study, a brief discussion of the subject sample, and a summary and discussion of the results obtained from testing the hypotheses. Information compiled from the Life Experiences Survey and from the Personal Impressions Questionnaire, which were completed by all participants at the conclusion of the study, will also be examined. The limitations of the study will be assessed, as will the research and counselling implications generated by this study.

Restatement of the Purpose

The present study was designed and carried out for the purpose of determining (a) if changes occurred on the dependent measures of symptomatic psychological distress, marital adjustment, relationship quality change, and sexual satisfaction for men and women who were undergoing the medical investigation of their fertility problems, (b) at which point(s) during the medical investigation such changes occurred, (c) the nature of these changes, and (d) whether the changes were different for men and for women. The study also attempted to assess the impact of positive diagnostic information (treatment available), negative diagnostic information (no treatment available),

and more neutral diagnostic information (no treatment warranted - normal infertility), on the above-mentioned dependent measures, for the men and women who received this information. The research further attempted to explore the relationship between changes on the dependent measures and (a) the diagnostic information received by the participants regarding the partner in whom the organic source of their infertility problem was identified, and (b) the amount of time the participants had been trying to conceive prior to their attendance at the Fertility Clinic.

Discussion of the Sample

A review of the demographic information in Table 1 (p. 49), on the characteristics of the participants who voluntarily withdrew and the participants who remained in the study, would appear to suggest that the two groups were similar in terms of the number of years they had been in their present relationships, the number of years they had spent trying to conceive, the number of pregnancies the couples had experienced in the past, the socio-economic status of the couples, and their present occupations. While the educational level of the males who voluntarily withdrew from the study was somewhat higher than that of the males who remained, and the percentage of women who were homemakers was slightly higher for those who continued to participate in the study, the two groups were

remarkably similar to each other, suggesting that demographic factors were not influential in determining which couples completed the research.

From the available information, it would appear that the participants in the study were fairly well-educated, with 95.4% of the males and 95.4% of the females having completed high school, college and/or university. A majority of the men and women in the study were employed in white collar professions (72.1%), with 34.9% of the couples earning between $26,000 and $40,000 per year. In 72% of the cases, these income figures represented the joint income of the couple, as both members were employed, perhaps resulting in an inflated picture of the economic status of the research participants, relative to those couples who are temporarily or permanently reduced to a single income subsequent to the onset of parenting.

With a mean age of 29.47 years characterizing the males and a mean age of 28.3 years characterizing the females in the sample, and with the majority of the participants having been attempting to conceive for a period of two to four years (55.8%) prior to attending the clinic, and having been involved in their relationships for a mean duration of seven years, it would appear that the subjects in the study were relatively similar to the substantial number of young men and women, who, upon completion of their education and the onset of their careers, marry in their early to mid-twenties, and who attempt to begin

their families within the next two to three years. The sample did not appear to be characterized by highly traditional individuals who married at a young age and entered into parenthood shortly thereafter, nor did it appear to be characteristic of individuals who delayed parenthood until they were in their thirties and had entrenched themselves in their careers. However, the range of subjects in the sample appeared to be varied enough to encompass individuals from both of these categories.

Information was not available on the demographic characteristics of the couples who refused to participate in the study, making it difficult, therefore, to determine whether the experimental sample was indeed representative of the clinic population, and of the infertile population in general. However, the sample was very similar to the infertile couples involved in a study by Bell (1980), in which the mean age of the female participants was 27.9 years, the mean age of the male participants was 30.6 years, the mean duration of the marriages of the couples was seven years, and the mean length of time the couples had spent trying to conceive was 4.2 years. The sample was also somewhat similar to the 53 infertile couples studied by Seastrunk and his associates (1984), in which the mean age of the males was 31.34 years, the mean age of the females was 30.25 years, and the mean duration of the couples' relationships was 6.25 years. While the subject selection for both of the above-mentioned studies was not

elaborated upon in the research reports, the similarities between the subject samples would appear to indicate that the participants in the present study were fairly representative of couples who seek expert medical care for their fertility problems.

Sexual Satisfaction

The results of the hypothesis testing appear to suggest that the levels of sexual satisfaction of the 86 participants in the study, as measured by the ISS at the time of the initial medical interview, four weeks later during medical testing, at the time of diagnosis, and at six weeks post-diagnosis, were not significantly differentiated across the four testing sessions, on the basis of sex, diagnostic information, identified etiological source or time spent trying to conceive prior to attending the clinic. The mean scores of the participants in all of the categories under examination remained within the sexually satisfied range of the ISS scale, although relatively large standard deviation scores served to suggest wide variability in the sexual satisfaction levels of the participants in each of these categories.

One might speculate that with such wide variability among the ISS scores of the men and women in the study, the levels of sexual satisfaction of the participants, while remaining consistent throughout the infertility investigation, varied along the continuum of satisfaction,

from those who were extremely satisfied with their sexual relationships to the participants who were extremely dissatisfied with their sexual relationships. In fact, a review of the raw data shows the mean ISS scores of the entire group of participants to range from zero through to 77, with some men and women consistently scoring in the very dissatisfied range of the scale, and others consistently scoring in the very satisfied range of the ISS scale.

Information regarding the sexual satisfaction of the participants prior to their participation in the study was not available, making it impossible to determine whether the men and women who were scoring within the sexually dissatisfied range of the ISS were experiencing difficulty in their sexual relationships prior to their attendance at the Infertility Clinic, or whether their sexual dissatisfaction coincided with the onset of the medical infertility work-up. In any event, the medical infertility investigation did not appear to elicit changes in the sexual relationships of the men and women in the study, in terms of significantly altering their levels of sexual satisfaction as the investigation progressed.

Important to note, however, were the high mean ISS scores obtained by the participants who received a neutral diagnosis of normal infertility, indicating a greater degree of sexual dissatisfaction among these men and women, relative to the ISS scores obtained by the participants in the

positive and negative diagnostic information categories (see Table 24, p. 92). Although the differences between the scores obtained by the participants in the three diagnostic groups were not statistically significant, the ISS scores of the twelve participants who were diagnosed as having no identifiable organic cause for their inability to conceive, were consistently higher than the scores obtained by the participants in the other two diagnostic categories, even prior to the receipt of the unidentified infertility diagnosis.

Large standard deviation scores again served to suggest wide variability in the levels of sexual satisfaction experienced by the participants in this unidentified infertility group, leaving some question as to the existence of sub-groupings of sexually satisfied and extremely sexually dissatisfied individuals within this larger grouping of participants. Examination of the raw data, in fact, confirms the presence of two couples in this grouping whose members consistently scored more than 30 points across the four testing sessions, with the ISS scores obtained by the two men and two women in these couples ranging from 31 to 68 points. A review of the data in Table 27 (p. 96) also suggests somewhat higher levels of sexual dissatisfaction for the male participants who were diagnosed as being 'normal infertile', than for the female participants in this grouping; however, these differences were not statistically significant. While one

might speculate about the possible implications of these higher ISS scores in terms of the assessment and treatment of infertile individuals for whom an organic etiology cannot be diagnosed, further research is necessary to assess the nature of this potential relationship prior to any causal conclusions being drawn.

The results of the present study appear to concur with the observations made by Bell (1980), who reported a 13% incidence of diminished sexual satisfaction among twenty primary infertile couples, with the incidence of sexual dissatisfaction not found to be specific to the partner in whom the organic problem was identified. However, while Bell reported a greater degree of sexual dissatisfaction among the women in his sample (four women as opposed to one man), the results of the present study suggest similar levels of sexual satisfaction for both the male and the female participants. Such a discrepancy may perhaps be accounted for by the interview assessment procedure utilized by Bell (1980), during which time participants were questioned regarding their sexual relationships. The male participants may have been more reluctant in such a format, to discuss any problems they were experiencing in their sexual relationships. As well, the consistency in the responses of the men and women in the present study, across the four testing periods, may, in fact, have been a more reliable measure of the sexual satisfaction levels of infertile couples during the infertility investigation,

than the single session assessments made by Bell (1980).

While Berger (1980) reported a 63% incidence of sexual dysfunction in the form of bouts of impotence, for the sixteen males in his study who were identified as being azoospermic, the results of the present study do not appear to concur. Perhaps the apparent discrepancy in these results may be related to the small number of men in the present sample who were identified as being azoospermic (four), and to the fact that the ISS, being a measure of sexual satisfaction, may not have been sensitive to specific types of sexual dysfunction. In other words, while the males who were identified as being azoospermic may have suffered transitory bouts of impotence subsequent to this diagnosis, the overall sexual satisfaction of the couples may not have been impaired, as measured by the ISS.

Disruption of the couples' sexual life and subsequent sexual dissatisfaction and/or sexual dysfunction during the medical work-up and treatment of infertility has been reported consistently throughout the infertility literature (Berger, 1980; Debrovner & Shubin-Stein, 1975, 1976; Elstein, 1975; Menning, 1977; Seibel & Taymor, 1982; Rutledge, 1979; Walker, 1978; Wilson, 1979). During the infertility investigation, "enormous pressure" is said to be placed "on the sexual functioning of this group of patients" (Seibel & Taymor, 1982, p. 139). It is important to note that sexual satisfaction and sexual functioning may well represent two different dimensions of a couple's sexual

relationship, with a measure of sexual 'satisfaction' such as the ISS being a measure of an individual's subjective level of satisfaction with his or her sexual relationship, as opposed to being a measure of his or her sexual functioning. Keeping this difference in mind, it would appear from the results of the present study, that the medical infertility investigation, and the intrusive procedures which were involved in such a work-up, were not, in themselves, influential in altering the levels of sexual 'satisfaction' reportedly experienced by the men and women who were undergoing such an extensive investigation. Rather, the results of the study suggest that a percentage of the infertile participants were experiencing dissatisfaction in their sexual relationships prior to any specific medical intervention in their sexual lives. Such dissatisfaction did not appear to be related to the amount of time the couples had been attempting to achieve a pregnancy prior to attaining expert medical care, nor did the level of sexual dissatisfaction appear to be a function of the sex of the individual or the diagnostic information received by the individual. From the observations made in the study, the levels of sexual satisfaction or sexual dissatisfaction experienced by the participants apparently remained relatively constant throughout the infertility investigation, even subsequent to the receipt of information by the men and women regarding the potential outcome of their future procreative efforts.

Considerable reference has been made in the infertility literature to sexual problems which may "masquerade as cases of infertility" (Elstein, 1975, p. 296), with questions being raised regarding the degree to which psychosexual problems are primary or secondary to the infertile state (Drake & Grunert, 1979; Rutherford, 1965; Wilson, 1979). According to Walker (1978), sexual dysfunction may well be a cause of infertility in cases where a physical etiology cannot be found. While caution should be taken in drawing a causal connection between psychosexual problems and infertility, the consistently higher mean ISS scores obtained by the participants in the present study who were diagnosed as having no identifiable organic etiology to their fertility problems and the identification of couples in this group who were very dissatisfied with their sexual relationships, may well suggest the need for further research into the sexual relationship of the infertile couple, as may the wide variability in the ISS scores obtained by the participants in each of the categories under investigation. The need for a detailed and comprehensive sexual history to be taken during the initial evaluation of the infertile couple has been emphasized by numerous researchers and practitioners over the past several years (Berger, 1980; Debrovner & Shubin-Stein, 1975, 1976; Drake & Grunert, 1979; Elstein, 1975; Seibel & Taymor, 1982; Walker, 1978). The results of the present study, while remaining speculative, suggest that an

extensive sexual history and assessment may be particularly facilitative in identifying couples whose sexual relationships may be in difficulty. Medical intervention in the case of the sexually dissatisfied and/or dysfunctional couple may need to be altered, with time being taken to assist these couples in dealing with such sexual difficulties, prior to proceeding with any medical testing.

Marital Adjustment and Marital Change

The results of the hypothesis testing appear to suggest that the marital adjustment of the 86 participants in the study, as measured by the MAT, was not significantly differentiated, across the four testing sessions, on the basis of the sex of the participants, the diagnostic information received by the men and women, the identification of the partner in whom the etiological source of the couple's infertility was found, or on the basis of the amount of time the participants had been trying to conceive prior to their attendance at the Fertility Clinic. The mean marital adjustment scores of the participants in each of the categories under examination consistently remained within the adjusted range of the MAT scale: at the time of the initial medical interview, four weeks later during medical testing, at the time of diagnosis, and at six weeks post-diagnosis. Significant differences were observed, however, between the MAT scores obtained by the 43 male participants, as compared to the MAT scores

obtained by the 43 female participants, with the women reporting better 'accommodation to their partners' than the men in the study. However, the MAT scores of the males and females did not differ significantly across the four testing sessions, suggesting that these sex differences remained relatively consistent across time, while not appearing to be affected by the infertility investigation.

Relatively large standard deviation scores within each of the categories under examination served to suggest some variability in the perceived marital adjustment of the participants. In fact, a review of the raw data indicated that the MAT scores of the participants ranged from 35 points on the lower end of the adjustment continuum, to 153 points on the higher end of the marital adjustment scale. The relatively wide variability in marital adjustment scores combined with the mean scores obtained by the participants in the adjusted range of the MAT, suggest that while some of the participants in the study were scoring within the maladjusted range of the scale, the majority of men and women apparently perceived their relationships as being adjusted, in spite of the infertility investigation and its potential repercussions.

Without information regarding the levels of marital adjustment within the relationships of the participants prior to their participation in the study, it is impossible to determine whether the experience of infertility itself impacted positively or negatively on the marital relation-

ships of the men and women involved. However, what can be assessed, is that the medical intervention into the relationships of these 43 couples was not influential in altering the marital adjustment of the couples in a positive or negative manner. Although in isolated cases the infertility investigation coincided with changes in the marital adjustment of particular men and women in the study, as in the case of one male whose MAT scores ranged from 151 points in the first testing session, to 113 in the second, 115 in the third, and to 116 in the fourth session, this type of change in MAT scores only appeared to occur in isolated cases. For the majority of the participants in the study, however, the infertility investigation did not coincide with positive or negative changes in their levels of marital adjustment.

The results of the hypothesis testing for the RCS provided information regarding the changes experienced in the quality of the relationships, as opposed to the marital adjustment, of the couples in the study. The RCS scores obtained by the men and women were not significantly differentiated, across the four testing sessions, on the basis of sex, diagnostic information, identified etiological source, or time spent trying to conceive prior to attaining expert medical care. In fact, the mean relationship change scores obtained by all but the male participants who received a neutral diagnosis, consistently indicated positive relationship changes for the participants in each

of the categories under examination. On the one occasion during the second testing session when the males in the neutral diagnostic category scored below the 'no change' score of 80 points, their mean RCS score was 79.17; only .83 of a point into the negative change range of the RCS scale. Therefore, the negative change perceived in the relationships of these male participants on the second session of testing was minimal. As well, generally smaller standard deviation scores on the RCS suggest somewhat less variability in the relationship changes reported by the participants, as opposed to the variability in scores observed for the ISS and MAT.

With information not being available regarding the state of the relationships of the participants prior to their attendance at the clinic, it is difficult to assess the impact of the experience of infertility on the relationships of these couples. However, if indeed the RCS is sensitive to positive and negative changes in the relationships of couples, then the positive change scores consistently reported by the participants in each of the categories under examination, would appear to suggest that being involved in the medical infertility investigation had a positive impact on the relationships of the men and women involved in the research. Therefore, while the marital adjustment level of the couples in the study was not significantly altered throughout the course of the infertility investigation, the general quality of the

couples' relationships improved as the medical investigation progressed. With the participants being asked to assess the changes in their relationships from one testing session to the next, scores above 80 points would suggest relationship quality improvement from pre-clinic levels throughout the investigation from session 1 through to session 4. Therefore, as the investigation progressed, the men and women in the study perceived the quality of their relationships to improve.

The results of the present study concur with the research conducted by Weltzien (1983), which found the marital interaction scores on the Dyadic Adjustment Scale for the 85 infertile couples tested, to be within the normal range of the scale, with the couples perceiving the quality of the marriages as being satisfactory. In the interview data collected by Mai (1972a), the marital relationships of the infertile couples studied were rated as being good to very good in overall quality.

However, the results obtained in a study by Seastrunk and his associates (1984) appear to be somewhat discrepant from the results obtained in the present study, with 45% of the infertile couples investigated by Seastrunk reporting increased difficulty in living harmoniously with their spouses. The difference in results may well be related to the difference in the sample investigated by Seastrunk, which included only those couples who were undergoing 'extensive medical treatment' for their

infertility. While the medical infertility investigation and diagnosis may not impact negatively on the marital adjustment or quality of the relationships of the couples who must undergo this experience, perhaps the pursuit of extensive infertility treatment subsequent to the receipt of a diagnosis may take a toll on the relationships of the couples involved. Within only six weeks of diagnosis, couples for whom treatment is available for their infertility (70% in the present study), may well be optimistic about their potential to eventually achieve their desired pregnancy.

In conclusion, while some researchers have reported increased difficulty experienced in the relationships of infertile couples during the infertility investigation and treatment (Bresnick, 1981; Feur, 1983; Seastrunk *et al.*, 1983; Wilson, 1979), others have observed a strengthening in the relationships of couples who have had to deal with this experience (Armstrong, 1982; Mazor, 1979; Menning, 1977; Shapiro, 1982). The results of the present study suggest that medical intervention during the infertility investigation does not serve to alter the level of marital adjustment in the infertile marriage. Such intervention, in fact, appears to enhance the perceived quality of the infertile couple's relationship. It would appear that the implementation of action in terms of attempting to find a solution to their infertility concerns, may well be a positive step in the lives and relationships of the

couples who have been trying, unsuccessfully to have a child. The impact of extensive and prolonged infertility treatment, however, remains to be evaluated.

Symptomatic Psychological Distress

Several changes were observed in the symptomatic psychological distress levels of the participants in the study as the infertility investigation progressed, with the overall 'General Symptom Index' (GSI) and the nine primary symptom dimension scales of the SCL-90-R serving to specify and highlight the nature of these changes. For the purpose of facilitating the discussion of the observations which were made regarding the psychological distress levels of the 86 participants in the study, significant changes on the GSI scores and the nine subscale scores will be reviewed for the 86 participants as a group, on the basis of sex differences, on the basis of the diagnostic information received by the participants, and the differences in the distress levels of the men and women in the three diagnostic categories, on the basis of the identification of organic source, and based on the amount of time the participants had spent attempting to conceive prior to attending the clinic.

A review of the mean GSI scores obtained by the 86 participants in the study indicated that the men and women were significantly more distressed at the time of the initial medical interview, with a mean score of 57.12

placing the subjects in approximately the 79th percentile range of the SCL-90-R normative sample of non-patient men and women, indicating considerable psychological distress at the time of the initial testing. The psychological distress experienced by the participants during the initial sessions was observed to be manifest in the symptom dimensions of Somatization, Obsessive-Compulsive behavior, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Paranoid Ideation and Psychoticism. According to Derogatis (1983), scores of 63 or more points on any two of the symptom dimensions or on the GSI would serve to indicate "a positive diagnosis or a case" (p. 28). While the mean scores obtained by the participants in the study on the GSI and on all but the Phobic Anxiety scale of the SCL-90-R, were higher at the time of the initial medical interview, with significantly lower scores being obtained by the participants four weeks later during medical testing, at the time of diagnosis and at six weeks post-diagnosis, these mean scores remained within the negative diagnosis range. At no time during the investigation did the levels of symptomatic psychological distress experienced by the participants reach the point of "caseness". The psychological distress levels were actually observed to subside to within the 30 to 60 percentile range, as the medical investigation progressed, and to remain at these levels up to six weeks following the receipt of a diagnosis. This initial stress may well have been a reflection of the

couple's anticipation of whether they would be accepted into the infertility program, the unknown nature of the medical procedures and tests they would have to undergo, and the potential outcome of these medical interventions in terms of achieving a pregnancy.

As for the differences obtained in the psychological distress scores of the male participants and the female participants in the study, significant differences were observed between the mean GSI scores obtained by both the men and the women, across the four testing sessions, with the greatest degree of psychological distress appearing to have occurred during the first session for both sexes. The only difference in the GSI scores of the men and women who were tested, occurred at the point of diagnosis, during which time the females in the study scored in approximately the 70th percentile range of the scale, while the males scored in approximately the 50th percentile range. This differentiation may well have been due to the fact that in the case of 70% of the couples studied, the fertility problem was diagnosed as being of a female origin. Higher levels of stress would, in fact, be expected at the time of diagnosis, when decisions must be faced regarding the extent and success of treatments, the available parenting alternatives, and/or the possibility of a child-free lifestyle. Male and female differences in overall psychological distress did not persist, however, with the GSI scores of both sexes returning to similar levels within six weeks of

receipt of a diagnosis.

In terms of symptom dimensions, the first session scores of both the males and the females in the study were again observed to be significantly higher than the second, third and fourth session scores, on all but the Phobic Anxiety scale; an observation which was consistently reinforced in subsequent hypothesis testing. Diminished levels of psychological distress were therefore observed for both the males and the females following the initial interview, as the medical investigation progressed.

While the Somatization scores of the female participants differed significantly across the four testing sessions, as did the Somatization scores of the male participants (see Table 41, p. 115), significant differences between the Somatization scores of the men and women in the study were not observed. The Phobic Anxiety scores obtained by the men and women in the study were significantly differentiated across time, however, with the female participants scoring consistently higher on this symptom dimension than the male participants and with the most significant difference being observed between the first session Phobic Anxiety scores of the males and the females (see Table 41, p. 115).

Phobic Anxiety has been defined as "a persistent fear response . . . which is characterized as being irrational and disproportionate to the stimulus, and which leads to avoidance or escape behavior" (Derogatis,

1983, p. 9). One might speculate that the higher Phobic Anxiety scores of the females in the study may have been related to the fact that, prior to the determination of a diagnosis, the cause of infertility is often attributed to the female member of the infertile couple (Menning, 1977). Perhaps the higher levels of irrational fear reported by the females in the study, were related to the women's anxiety over the potential outcome of the infertility investigation.

Significant differences were observed at the point of diagnosis, between the Obsessive-Compulsive and Psychoticism scores obtained by the males and by the females in the study, with the female participants scoring in approximately the 68th percentile range of the Obsessive-Compulsive scale, and in the 73rd percentile range of the Psychoticism scale. The Depression scores of the female participants were also observed to be within the 79th percentile range at the point of diagnosis, as compared to the Depression scores of the male participants which were approximately in the 53rd percentile range. Such differences coincided with the significantly higher third session mean GSI scores of the female participants, and may well have been related to the number of couples in the study in which the fertility problem was diagnosed as being of a female origin. Increased levels of depression following the receipt of diagnostic information confirming the presence of an organic problem, would be expected, in

light of the implications which accompany such information.

Depression has been reported as a common symptomatic reaction to infertility, with the female member of the infertile couple often being found to elicit higher levels of depression than the male (Bell, 1981; Bresnick, 1981; Feuer, 1983; Menning, 1977; Seastrunk *et al.*, 1984; Weltzien, 1983). Higher levels of depression in the female may well be related to the fact that the identification of male reproductive problems often do not require the extensive, expert medical investigation of the type conducted at a reproductive clinic. As such, the higher levels of depression reported for the female patients may well be related to the larger number of fertility problems of a female origin, which are identified within such a setting. The reasons for the observation of differences between the scores of the males and the females on the Obsessive-Compulsive and Psychoticism dimensions of the SCL-90-R following diagnosis, however, remain uncertain. Considering the potential relatedness of the nine symptom dimensions, it would appear that caution should be taken in attempting to interpret the meaning of differences such as these, particularly since the scores obtained by the participants in each of the categories under investigation were not observed to be within the positive diagnosis range.

When the participants in the study were evaluated on the basis of the positive, negative or neutral diagnostic

information which they received, significant differences were not observed between the GSI scores obtained by the men and women in each of the three diagnostic categories, across the four testing periods. In other words, the receipt of diagnostic information was not observed to be related in any identifiable way, to changes in the GSI scores obtained by the participants in these three diagnostic categories. With GSI scores also not being significantly differentiated on the basis of the sex of the participants in each of the diagnostic categories, and with significantly diminished GSI scores being observed following the initial testing session, it would appear that the participants in the three diagnostic groupings responded to this diagnostic information with similar levels of psychological distress, in that their mean scores on the GSI ranged from the 50th to the 75th percentile. As might be expected, the men and women who received positive diagnostic information appeared to score somewhat lower on the GSI than the participants who received negative or neutral diagnostic information; however, these differences were not observed to be significant.

In terms of the nine symptom dimensions of the SCL-90-R, significant differences were observed between the Psychoticism scores obtained by the participants in the three diagnostic categories, across the four testing sessions, with the participants in the positive and negative categories initially scoring within the 74th and 84th

percentile range of the Psychoticism scale respectively, as opposed to the 52nd percentile range Psychoticism score of the participants in the neutral category. Since diagnosis was not determined until after the second session for the participants in the study, it would appear highly unlikely that the differences observed between the scores obtained by the participants in these diagnostic groupings, at the time of the initial medical interview, were related to the diagnostic information which these men and women received.

The scores obtained on the nine SCL-90-R subscales, by the participants in the three diagnostic categories, were also not observed to be differentiated on the basis of the sex of the participants. While significant sex differences were observed across time on the Somatization, Phobic Anxiety and Psychoticism scales for the 43 males and the 43 females in the study (as discussed previously), significant differences were not observed across time when the scores obtained by the participants in each of the three diagnostic groupings were further delineated on the basis of sex. Results of the post-hoc testing, however, again served to indicate significant changes between the psychological distress levels of the participants in the study, with the greatest degree of stress being exhibited at the time of the initial interview, followed by significantly lower levels of psychological distress as measured by the symptom dimensions of the SCL-90-R, during medical

testing, at the time of diagnosis, and six weeks diagnosis.

What is most interesting to note, is that the symptomatic psychological distress scores obtained by the participants in the neutral category were not significantly differentiated from the scores obtained by the participants for whom an organic etiology was found. As well, the pre-diagnosis and post-diagnosis scores obtained by the men and women in this 'unidentified infertility' group, were not observed to be within the positive diagnosis range of the SCL-90-R scale. In spite of the small sample size of this neutral grouping, relative to the size of the group of participants who received a positive diagnosis, the results of the present study would appear to refute the considerable body of literature which calls into question the psychological normality of the male and female who have no known organic cause to explain their inability to conceive (Eisner, 1963; Freeman *et al.*, Gupta *et al.*, 1982; O'Moore *et al.*, 1983; Singh & Neki, 1982). Four consecutive evaluations over the course of approximately six months of supposedly stressful medical intervention, did not serve to identify any signs of psychopathology in this group of 'normal infertile' individuals. While further investigation may be required with larger sample sizes to substantiate these observations, the results of the present study tend to support the overall psychological well-being of those participants for whom an organic etiology was not found for their inability to conceive.

In terms of the identification of the source of the couple's fertility problem, significant differences were not observed between the GSI scores obtained by the participants who were identified as having an organic fertility problem, and the participants who were not identified as having an organic fertility problem. The initial session GSI scores of both of these groups of participants were observed to be within the 70th to the 80th percentile range, followed by a lowering in the levels of psychological distress reported by the men and women as the investigation progressed.

Interesting to note, however, was the increase in the third and fourth session GSI scores for the participants who were identified as having an organic fertility problem. While the GSI scores of the individuals who were not identified as having an organic problem continued to decrease as the investigation progressed, the GSI scores of the 'identified' group of participants were seen to increase from their second session testing levels, following receipt of this diagnostic information. The third and fourth session GSI scores were not 'significantly' different for these two diagnostic information groups of participants. However, a review of the scores obtained on the nine SCL-90-R symptom dimension subscales indicated that the Depression scores of the 'identified' group differed significantly from the Depression scores of the 'not identified' group, with the third session Depression

scores of the 'identified' group of participants being substantially higher than the third session scores of the participants who were not identified as having an organic fertility problem. One might again speculate that higher Depression scores would be expected in the case of the partner who must deal with the implications of such diagnostic information, in terms of the availability and potential success of treatment, and in terms of the intrapersonal and interpersonal impact of such information. The third session Obsessive-Compulsive and Psychoticism scores obtained by the 'identified' group of men and women were also observed to be considerably higher than those obtained by the 'not identified' group of participants. On all but the Phobic Anxiety and Paranoid Ideation scales, the third session scores of the 'identified' participants were seen to increase from their second session levels, while the scores of the 'not identified' participants continued to decrease on six of the nine symptom dimensions.

Therefore, it would appear that the identification of the partner with 'the problem', may well have impacted in a more negative manner on this member of the couple, in terms of increasing his or her level of psychological distress, in spite of the fact that the majority of participants who were identified as having an organic fertility problem, were identified as having a problem for which treatment was available. While the psychological

distress scores of this primarily female group of 'identified' participants were not observed to reach the level of a positive diagnosis upon receipt of this information, the apparent increased stress of these participants may warrant further attention. At a time when they are already experiencing elevated levels of stress, often these individuals must subsequently undergo extensive medical treatment. If treatment is not available, the psychological distress of these individuals may be even more enhanced, when faced with the permanence of their inability to produce a child.

In terms of the amount of time the men and women in the study had been trying to conceive prior to attending the clinic, significant differences were not observed in the overall level of symptomatic psychological distress which was experienced by the participants in each of the four pre-clinic time interval categories, as the investigation progressed. The GSI scores of the participants in all but the four- to six-year grouping, were generally observed to significantly decrease from their initial interview levels, with the GSI scores of the four- to six-year time interval group remaining relatively constant in the 70th percentile range. Only the Obsessive-Compulsive and Hostility scores were observed to differ significantly between the four pre-clinic time interval groups, with the participants who had been trying to conceive for a period of four to six years scoring significantly higher on the Hostility scale at the six weeks post-diagnosis test

period, than the participants in the three other time interval categories. The fourth session Obsessive-Compulsive scores were also substantially higher for the participants in the four- to six-year time interval category, than for those men and women who had been trying to conceive for less than two years, or for more than six years, prior to attending the clinic. With a sample size of only four couples in the four- to six-year group, however, any interpretation of the meaning of these higher scores would be unjustified.

The mean psychological distress scores of the participants in each of the four pre-clinic time interval categories remained within the negative diagnosis range, even in the case of the Hostility and Obsessive-Compulsive scores of the eight men and women who had been trying to conceive for a period of four to six years prior to attending the clinic. Contrary to the research results reported by Debrovner and Shubin-Stein (1975), and by Weltzien (1984), it would appear that the amount of time the couples in the present study had spent trying to have a child prior to attaining expert medical care, was not a factor related to the levels of psychological distress experienced by these men and women as they progressed through the medical infertility investigation. The impact of extensive and prolonged infertility 'treatment' on the psychological distress levels of infertile men and women, however, remains to be determined.

In conclusion, the infertility literature is replete with references to the 'crisis' experienced by the infertile couple, and, in particular, to the intense stress induced by the intrusive and often time consuming medical investigation of infertility (Bell, 1980; Bresnick, 1981; Debovner & Shubin-Stein, 1975; Menning, 1977; Seastrunk *et al.*, 1984; Seibel & Taymor, 1982; Weltzien, 1983; Wilson, 1979). The results of the present study indicate that the infertility investigation appeared to be most stressful for the participants at the time of the initial medical interview, with the level of psychological distress experienced by the men and women in the study generally subsiding as the medical investigation proceeded. For the female participants, the receipt of diagnostic information also appeared to be somewhat stress inducing, with an increase in psychological distress perhaps being related to the fact that the majority of participants in the study who were identified as having an organic fertility problem, were female. The receipt of positive, negative or neutral diagnostic information did not appear to be a factor related to the stress levels of the participants, nor did the amount of time the couples had spent trying to conceive prior to their attendance at the clinic. However, those individuals who were identified as having an organic fertility problem appeared to respond to this diagnostic information with somewhat higher psychological distress levels than the participants who were not identified as

having an organic fertility problem. The implications of this diagnostic information, both in terms of treatment and eventual outcome, would appear to have been somewhat more stress-inducing for the individuals who received it, than the information received by the other participants in the study, which indicated the source of their fertility problem in their partner.

At no time did the symptomatic psychological distress scores of the participants in any of the categories under investigation reach the level of a positive diagnosis or 'caseness', although mean distress scores ranging from the 30th percentile to the 84th percentile across the four testing sessions would appear to suggest that many of the men and women in the study were experiencing some degree of psychological distress. Therefore, while the infertility investigation did not generally appear to result in extreme or incapacitating stress for the men and women in the study, as defined by Derogatis (1983), the participants did appear to be experiencing a degree of psychological distress, as they progressed through the various stages of the investigation. It remains unclear as to whether the psychological distress experienced by particular individuals in the study was intense enough to be debilitating or to require the assistance of a mental health professional. The impact of extensive treatment on the psychological distress levels of the infertile couple also remains to be determined.

The Life Experiences Survey

In reviewing the LES scores which were reported by the participants in the study, for the six-month time period during which they were involved in the research, it would appear that the men and women who responded to the questionnaires were generally not experiencing events in their lives at the time of the infertility investigation, which they subjectively assessed as being particularly undesirable or as having a negative impact. The mean positive LES scores of the participants were actually higher than the mean negative scores, suggesting that the changes in psychological distress levels reported by the participants while they were undergoing the medical investigation of their infertility, were not apparently related to other negative events in the lives of these men and women. Therefore, it would appear that the observations which were made regarding the overall psychological distress levels of the men and women in the various categories under examination, may well have been related to the infertility investigation and the information which was received by the participants at the time of diagnosis.

The Need for Psychological Assistance

Although the mean marital adjustment, sexual satisfaction and psychological distress scores of the participants in the study remained in the adjusted range, and the quality of the relationships of these couples was

reported to improve as the infertility investigation progressed, a substantial majority of the men and women who participated in this research indicated that there was a need for the provision of psychological services in the area of infertility. While only 53% of the male participants and 72.1% of the female participants reported that they personally would have availed themselves to such services had the opportunity been provided, 95.3% of the men and 97.7% of the women felt that the provision of such services would have helped in meeting the needs of the infertile couple.

Several respondents commented on the need to know that there was someone available other than their physician, who could answer their questions, help them express their feelings, and help them to deal with their "lack of control" during this time. Other respondents expressed a need to know if their thoughts and feelings were 'normal' responses to the infertility experience, and to share with other couples their questions, fears and feelings regarding the infertility investigation, infertility treatment and the available alternatives for parenting. Some participants referred to their feelings of 'isolation' and 'helplessness', and to their desire to have someone other than their spouse, with whom to share their concerns.

It is interesting to note that the time of the initial medical interview and the time of diagnosis, were perceived by many of the participants as being when the provision of

psychological services would have been most beneficial. These times correspond to the two testing periods which were identified as being the most stressful for the men and women in the study, in terms of their levels of symptomatic psychological distress. The value of a psychological interview at the outset of the medical infertility investigation has been consistently emphasized in the literature, to assist couples in dealing with their anxiety, to inform them of what they may physically and emotionally expect during the work-up, to explore the possibility of sexual and/or marital problems which may be affecting the couple, and to provide the couple with an element of control over their lives at this time (Berger, 1977; Bresnick, 1981; Bresnick & Taymor, 1979; Frank, 1984; McCormick, 1980; Sturgis *et al.*, 1957; Wiehe, 1976b; Wilson, 1979). Intervention at the time of diagnosis has also been recommended and would appear to be helpful in aiding the couple to deal with the implications of the diagnostic information which they receive, and in assisting them in their exploration of alternatives and in their decision-making (Aitken, 1982; Armstrong, 1982; Bresnick, 1981; Farrer-Meschan, 1971; Mazor, 1979; Menning, 1979; Rosenfeld & Mitchell, 1979; Rutledge, 1979).

The majority of participants felt that they would have preferred to have been counselled as a couple, with reference being made by some men and women to infertility as being a 'couple's problem', and not a problem of the

individual. These results again concur with the vast majority of infertility literature, in which recommendations are made for counselling both members of the infertile couple, particularly in cases where marital or sexual difficulties are being experienced by the couple, or where procedures such as AID or in-vitro fertilization are options available to the couple (Berger, 1977; Bresnick, 1981; Bresnick & Taymor, 1979; Frank, 1984; Farrer-Meschan, 1971; Mazor, 1979; Menning, 1979; Rosenfeld & Mitchell, 1979; Wiehe, 1976b; Wilson, 1979).

Therefore, while it is impossible to determine how many individuals in the present study would have actually accepted the services of a psychologist while undergoing the infertility investigation, it would appear that these men and women perceived the infertility experience as being a stressful and difficult enough time in their lives, to warrant the availability of psychological services concurrent with the medical services with which they were being provided. Support for the availability of such services during the investigation and treatment of the infertile couple, may well be gleaned from the subjective impressions of these participants.

Limitations of the Study

The study was necessarily limited by several factors. The voluntary nature of participation in the research, and the ethical requirement that the participants be informed

of their right to "withdraw from the study at any time", may well have influenced the random nature of the sample. Ethical restrictions also prohibited the gathering of data on couples who refused to participate in the study, and as such, further questions regarding the randomness of the sample remained unanswered. The sample primarily consisted of fairly well-educated, middle- to upper middle-class men and women, with all of the participants being drawn from the clientele of only one clinic which specialized in the investigation and treatment of fertility-related concerns. Therefore, generalizability of the results of the study to other groups of infertile men and women would have to be made with relative caution.

Another limitation of the study was related to the size of the samples in the various sub-groupings which were examined. While the overall sample size of 43 men and 43 women provided an adequate basis for statistically analyzing the data, the size of the samples in some of the categories which were examined were sometimes quite small, making it difficult to draw conclusions and make generalizations based on the data drawn from only a limited number of subjects. Being an exploratory study, it was important to evaluate as many trends as possible from the available data, in terms of highlighting possible directions for future research. However, caution had to be applied to the interpretations being made, in cases where the data was based on small sample sizes.

Another factor which limited the study included the necessary use of self-report instruments in measuring the dependent variables, leaving the results of the study open to possible response bias. Also, while the participants were requested to complete the test instruments independently of their spouse, without prior collaboration, the experimenter could not control for this occurence following the first testing session, making it impossible, therefore, to determine whether the responses of one member of the couple were influenced, in any way, by the other member of the couple.

The inability to test the participants prior to their initial experience with infertility, limited the drawing of causal connections between the participants' overall experience of being infertile, and their scores on the dependent measures. Also, while the instruments which were used to test the dependent measures were reported to have fairly good test/retest reliability, studies testing the reliability of these instruments over the sometimes substantial time periods between testing sessions in the present study, were not available. As such, the results of the research had to be interpreted with caution.

Another limiting factor had to do with the amount of time between the second and third testing sessions. For some participants, the time required to obtain a diagnosis following the completion of medical testing was relatively brief (eg. three to four weeks), whereas for other parti-

cipants who had to undergo more extensive exploratory testing prior to the receipt of a diagnosis, the time between the second and third testing session was quite prolonged (eg. twelve weeks). Also, while all of the participants were requested to complete and return the questionnaires within 48 hours of receiving them on the second, third and fourth testing sessions, the amount of time in which the men and women actually completed and returned the questionnaires varied from one individual to another and from one testing session to the next. The fact that this time between testing varied for the participants, and that some participants were required to undergo more extensive medical testing than others, may have served to limit the study.

Each couple in the study had been dealing with their infertility for a different period of time, and each couple may have undergone various other medical tests for their infertility prior to being referred for specialized care by their respective gynecologists. While the subject selection criteria implemented in the study attempted to circumvent this type of discrepancy, such experiential factors could not be completely controlled for, and therefore, may have served to limit the generalizability of the study.

Finally, as in the case of any research using human subjects, the results, which were based on the statistical analysis of mean scores, had to be interpreted with caution. While these mean scores may well have reflected particular trends in the sample under investigation, they were average

scores only, and as such, did not represent a complete picture of the phenomena being measured. The changes experienced by particular individuals in the sample had to be taken into consideration, so that valuable information regarding the needs of the infertile couples in the study were accurately evaluated.

Implications for Further Research

One of the primary drawbacks of the present study involved the composition and size of the subject sample. Questions may be raised regarding the results which were obtained from samples that sometimes consisted of only ten or twelve subjects. Questions may also be raised regarding the role played by the clinic staff in perhaps limiting and/or lessening the impact of the medical procedures which the couples in the study were required to undergo. Further research, using larger sample sizes from a number of clinics, would serve to validate or refute the generalizability of the results obtained in the present study.

A prime example of this is the case of the men and women for whom a medical reason could not be found for their inability to conceive. With only twelve participants in this sample, it was difficult to generalize the findings regarding the apparent psychological well-being of these men and women, and to determine the extent to which sexual problems experienced by some members of this 'unidentified infertility' group, were operative in potentially interfering

with their fertility. In this regard, the inclusion of an instrument to evaluate and assess the presence of sexual dysfunction, as opposed to sexual dissatisfaction, may be more facilitative in identifying any relationship between the sexual functioning of the 'normal infertile' couple and their fertility problems.

It is also important to determine if the impact of infertility and the infertility investigation and treatment is the same for secondary infertile couples as it is for primary infertile couples, and to determine if, in fact, the needs of these infertile groups are the same. Further research is required to clarify this issue.

In terms of instrumentation, the use of standardized instruments which have been designed to measure discrete symptom dimensions, such as 'depression' or 'anxiety', may provide a more valid and exact measure of the specific areas in which stress is manifested for the infertile individual, as opposed to the nine symptom dimensions measured by the SCL-90-R, each of which were based on the subjects' responses to a minimum of six and a maximum of thirteen items. The inclusion of interview data in future research may also be highly informative in assessing the psychological, emotional and relationship changes experienced by the infertile couple, and may provide more qualitative data regarding the specific problems which are experienced by the infertile man and woman.

Regarding the diagnostic information received by the

infertile couple during the medical investigation, more research is required to determine the specific needs of both the partner who is identified as having an organic fertility problem and the partner who is not personally identified as having an organic reproductive problem, but who must deal with the implications of the organic problem of his or her spouse.

The present study was specifically limited to investigating the psychological, emotional and relationship changes of primary infertile men and women, as they progressed through the medical infertility 'investigation'. As such, further research is necessary to determine the impact of the various types of infertility 'treatment' on the lives and relationships of the infertile couple. Empirical studies which are prospective and longitudinal in design, are required to determine the needs of the couple as they progress through the various stages of treatment, and/or as they face the prospect of not becoming biological parents. With the remarkable technological advancements being made in the area of human reproduction, and with the availability of children for adoption steadily decreasing, the need for immediate research in this area is obvious. Not only must the impact of treatment on the couple be evaluated, but the consequences of both successful and unsuccessful treatment on the infertile man and woman, and where applicable, on their offspring must also be assessed.

Counselling Implications

Many of the results of the present study support the need for a cooperative and complimentary approach to the diagnosis and treatment of infertility, by the members of the medical profession and by the mental health practitioner. While the medical investigation may not elicit a 'crisis-like' reaction for all individuals who must undergo this experience if they are to eventually produce a child, it would appear that a considerable amount of psychological distress is common at the time of the initial medical interview, when the nature of the couple's problem is being explored and a plan for appropriate medical treatment is being formulated. Probabilities for the eventual success and/or failure of the infertility investigation and treatment are also broached at this time. The incorporation of a psychological interview either immediately before or shortly following the initial medical interview may serve to assist in relieving some of the stress and fear which may be associated with the infertility investigation, and with the invasive medical testing procedures. Such an interview would also serve in making an initial contact with the couple, so that they are aware of, and somewhat familiar with, the psychological support services which are available to them should they require assistance later in the process. The brief sexual history, which is usually taken by a member of the nursing staff, might be better conducted by the psychologist during the initial counselling interview, so

that possible marital or sexual problems which may be affecting the couple and/or their fertility might be identified. Further psychological intervention may be appropriate and facilitative if such problems are apparent.

The incorporation of a counselling interview may also be facilitative shortly after the receipt of a diagnosis, when the man and woman are informed of the nature of their fertility problem, the availability of treatment, and the potential for a successful pregnancy following completion of the treatment regimen. Not only may the couple require assistance in dealing with the fact that one or both partners have an organic problem which is impeding their fertility, but they may also need help in reviewing their alternatives and in making decisions regarding the acceptance or rejection of the available treatment; decisions which may be particularly difficult when the probability of a successful pregnancy occurring following completion of the treatment is quite remote, as in the case of tubal reconstructive surgery or in-vitro fertilization. Other couples may require help in dealing with the receipt of a diagnosis identifying an etiology for which treatment is unavailable, as in the case of the azoospermic male, and may need assistance in coming to terms with the implications of this information, personally, and from the perspective of their relationship. Alternatives may need to be explored, and decisions made, regarding the acceptance of alternative forms of procreation or parenting, such as artificial

insemination with donor semen, adoption, and/or the acceptance of a child-free lifestyle. For those couples for whom a reason cannot be identified for their inability to produce a child, psychological assistance may be facilitative in helping the couple come to terms with the lack of certainty which accompanies such a diagnosis, and in deciding how they may best continue with their lives, in light of this uncertainty.

Many of the respondents in the study expressed a need to know that counselling services were available, which directly focused on the problems, fears and concerns of the infertile couple. Indeed, the mental health professional working in the area of infertility would need to be skilled, not only in the areas of individual, marital and sexual counselling, but would also need to be cognizant of the medical procedures and problems which are specific to the infertile population. The empirical results of the present study, and the subjective impressions of the 86 participants in the research, would appear to suggest that the availability of the services of such a skilled mental health professional, concurrent with, and perhaps subsequent to the available medical infertility services, would serve to better meet the needs of those men and women who are experiencing difficulty in achieving, what is for many individuals, an easily achieved, major life goal.

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A P P E N D I C E S

APPENDIX A

PERSONAL INFORMATION SHEET

APPENDIX A

PERSONAL INFORMATION SHEET

NAME: _____

ADDRESS: _____

_____

DATE OF BIRTH: _____
Day / Month / Year

DURATION OF PRESENT RELATIONSHIP: _____

HOW LONG HAVE YOU BEEN TRYING TO GET PREGNANT? _____

HOW MANY PREGNANCIES HAVE YOU HAD IN THE PAST? _____

HOW MANY LIVE BIRTHS HAVE YOU HAD IN THE PAST? _____

DO YOU HAVE ANY CHILDREN PRESENTLY LIVING WITH YOU? _____

IF SO, HOW MANY? _____

WHAT IS YOUR PRESENT OCCUPATION? _____

WHAT IS THE HIGHEST LEVEL OF EDUCATION YOU HAVE COMPLETED?

GRADE SCHOOL _____
HIGH SCHOOL _____
COLLEGE _____
UNIVERSITY _____
OTHER (Explain) _____

WHICH OF THE FOLLOWING SOCIO-ECONOMIC BRACKETS DO YOU AND YOUR MATE FIT INTO?

LESS THAN $15,000/year _____
$15 TO 25,000/year _____
$25 TO 40,000/year _____
OVER $40,000/year _____

RESEARCHER'S COMMENTS:

APPENDIX B

PERSONAL IMPRESSIONS QUESTIONNAIRE

APPENDIX B

PERSONAL IMPRESSIONS QUESTIONNAIRE

1. Based upon your infertility experience, do you believe that there is a need for the availability of psychological services in this area?

   YES _____ NO _____

   Comment: _____

   _____

   _____

2. If you answered YES to question #1, at what point during the investigation do you feel the provision of psychological services would be most helpful?

   _____ Pre-diagnosis (initial visit)
   _____ During Medical Testing
   _____ Immediately Following Diagnosis
   _____ Several Weeks After Diagnosis
   _____ During Treatment (eg. tubal surgery, medication, etc.)
   _____ All of the Above

3. If you were to have sought the aid of a psychologist for your fertility related concerns, would you have preferred to have been seen:

   _____ Individually
   _____ As a Couple
   _____ In a Group with Other Couples
   _____ In a Group of Individuals of the Same Sex
   _____ In a Group of Other Men and Women

4. If you had been provided with the opportunity to receive psychological assistance at any point during your infertility investigation, would you have availed yourself of these services?

   YES _____ NO _____

APPENDIX C

LETTER OF ETHICAL APPROVAL

APPENDIX C

THE UNIVERSITY OF CALGARY
Health Sciences Centre
3330 Hospital Drive N. W., Calgary, Alberta, Canada T2N 4N1

Faculty of MEDICINE
Telephone (403) 284-6541
1984-03-05

Dr. P. J. Taylor
Department of Obstetrics & Gynecology
Faculty of Medicine
The University of Calgary
Calgary, Alberta

Dear Dr. Taylor:

Re: Psychological and Relationship Changes of Couples Undergoing Fertility Investigation

The above-named proposal has been reviewed by the Conjoint Ethics Committee of the Foothills Hospital and Faculty of Medicine, The University of Calgary.

I am happy to report that the protocol has been approved from an ethical point of view.

Please accept the Committee's best wishes for success in your research.

Yours truly,

T. D. Kinsella, M.D.
Assistant Dean (Medical Bioethics)
and Chairman, Conjoint Ethics Committee

TDK:smh

c.c. Ethics Committee
R & D Committee
Ms. J. C. Daniluk

APPENDIX D

CONSENT FORM

APPENDIX D

CONSENT FORM

We are presently conducting a study to examine the impact that the infertility experience may have on the lives of those couples undergoing medical investigation for their fertility difficulties. The study involves the completion of four or five questionnaires of approximately ten minutes duration each, at the following times:

a) Initial visit to the clinic
b) One month later during medical testing
c) Within one week of diagnosis
d) Six weeks after diagnosis

The questionnaires deal with issues related to stress, marital change, sexual satisfaction and social support. Whenever possible the questionnaires will be completed at the clinic following your regular scheduled medical appointment. If your time does not permit completion at the clinic, we will request that the questionnaires be completed and returned by mail as soon as possible. You will be asked to complete the questionnaires independently of your spouse

Should you agree to participate, your answers will be held in the strictest confidence. Your participation, or refusal to participate, will not affect your treatment at the clinic in any way. In fact, your responses will not be identified by name to the clinic staff or in any written or oral report that is completed as a part of this study.

To signify your willingness to participate, please read and sign the section below.

On the basis of the above information, I voluntarily agree to participate in this study. I am aware that I will be asked to complete several questionnaires during our infertility investigation. The researchers have provided me with an opportunity to raise questions about the study, and have assured me that my identity will remain confidential. I am aware that I may withdraw from the study at any time without jeopardizing my medical treatment.

_____
(Signature)

_____
(Name - Printed)

_____
(Address)

_____

_____ _____
(Investigator) (Witness)

APPENDIX E

INSTRUCTIONS:

SESSION ONE

INSTRUCTIONS

PLEASE COMPLETE THE ENCLOSED QUESTIONNAIRES IN THE ORDER IN WHICH THEY ARE PRESENTED TO YOU. THIS IS NOT A TEST AND THERE ARE NO RIGHT OR WRONG ANSWERS, SO PLEASE FEEL FREE TO RESPOND TO THE QUESTIONS IN A STRAIGHTFORWARD MANNER. SEVERAL OF THE QUESTIONNAIRES ARE DUPLICATED ON THE REVERSE SIDE, SO PLEASE BE CERTAIN TO COMPLETE BOTH SIDES OF THE INSTRUMENTS, WHERE APPLICABLE. ALSO, IT IS OF UTMOST IMPORTANCE TO THE SUCCESS OF THE STUDY THAT YOU DO NOT CONSULT WITH YOUR SPOUSE OR COMPARE YOUR ANSWERS DURING COMPLETION OF THE TEST INSTRUMENTS, ALTHOUGH YOU MAY FEEL FREE TO DISCUSS YOUR IMPRESSIONS OF THE QUESTIONS AFTER THE QUESTIONNAIRES HAVE BEEN COMPLETED AND RETURNED TO THE EXPERIMENTER.

WHEN THE INSTRUMENTS HAVE BEEN COMPLETED, PLEASE PLACE ALL OF THE INFORMATION INTO THE ENVELOPE PROVIDED AND RETURN IT (UNSEALED), TO THE EXPERIMENTER OR TO THE RECEPTIONIST AT THE FRONT DESK IN AREA 5. SHOULD YOU BE REQUIRED TO TAKE THE PACKAGE HOME DUE TO TIME LIMITATIONS, PLEASE COMPLETE THE QUESTIONNAIRES WITHIN 24 HOURS AND RETURN THEM TO THE EXPERIMENTER IN THE STAMPED, ADDRESSED ENVELOPE PROVIDED.

AS YET, WE HAVE VERY LITTLE CONCRETE INFORMATION ON HOW THE INFERTILITY EXPERIENCE AFFECTS THE LIVES OF COUPLES WHO ARE UNDERGOING MEDICAL INVESTIGATION AND TREATMENT FOR INFERTILITY. YOUR COOPERATION IN HELPING US TO COMPILE THIS INFORMATION IS VERY GREATLY APPRECIATED. THANK YOU.

SINCERELY,

JUDITH DANILUK

APPENDIX F

INSTRUCTIONS:

SESSIONS TWO, THREE AND FOUR

Dear _____:

It has now been one month since you completed the first set of tests in the battery of instruments which are a part of this study.

The second set of tests are identical to the first, with the exception of the social support questionnaire, which is not included in the present test battery. Please complete the questionnaires within the next 48 hours, in the same manner as they were done during the first test session. Again, it is central to the validity of the study that the tests be completed independently of your spouse. You may, however, discuss any part of the test instruments with your partner after the instruments have been completed and returned in the addressed and stamped envelopes provided.

When this testing session is complete, I will be contacting you on only two more occasions; immediately following diagnosis and approximately 6 weeks later. At that point your participation in the study will be finished, and when the results of the study are completed and analyzed you will be notified. If you are interested in the overall results, a copy of the results section of the dissertation will be forwarded to you.

Allow me to emphasize again, the confidentiality of the study, and to encourage you to please complete the second set of instruments at your earliest possible convenience, to ensure the validity of the research results. Your cooperation is very greatly appreciated, and I look forward to meeting you again at some point in the future.

Sincerely,

Judith Daniluk, M.Sc.

APPENDIX F

Dear _____:

Enclosed, please find the third set of tests in the battery of instruments which are a part of this study.

The third set of tests are identical to the first and second set, with the exception of the social support questionnaire, which is not included in the present test battery. Please complete the questionnaires within the next 48 hours, in the same manner as they were done during the first and second test sessions. Again, it is central to the validity of the study that the tests be completed independently of your spouse. You may, however, discuss any part of the test instruments with your partner after the instruments have been completed and returned to me in the addressed and stamped envelopes provided.

Please complete the enclosed questionnaires in the order in which they are presented to you. This is not a test and there are no right or wrong answers, so please feel free to respond to the questions in a straightforward manner. Several of the questionnaires are duplicated on the reverse side, so please be certain to complete both sides of the instruments, where applicable.

The importance of this particular test session cannot be over-emphasized, as it is during this time that we may determine the impact of the diagnostic information that was recently given to you. This information will be extremely helpful in determining the nature and timing of the services to be provided at the clinic in the future. We greatly appreciate your continued participation in the study, and will be contacting you on only one more occasion in approximately 6 weeks.

Allow me to emphasize again the confidentiality of the study, and to encourage you to please complete the third set of instruments at your earliest possible convenience, to ensure the validity of the research results. Thank you again for your cooperation.

Sincerely,

Judith Daniluk, M.Sc.

APPENDIX F

Dear _____:

Enclosed, you will find the fourth and final set of tests in the battery of instruments which are a part of this study.

The fourth set of tests are identical to the second and third sets, with the exception of the Personal Impressions Questionnaire and the Life Experiences Survey which have been included in the present test battery only. Please complete all of the questionnaires within the next 48 hours, in the same manner as they were done in previous test sessions. Again, it is central to the validity of the study that the tests be completed independently of your spouse. You may, however, discuss any part of the instruments with your partner, after the tests have been completed and returned to me in the addressed and stamped envelope provided.

Please complete the questionnaires in the order in which they are presented to you. This is not a test and there are no right or wrong answers, so please feel free to respond to the questions in a straightforward manner. Several of the questionnaires are duplicated on the reverse side, so please be certain to complete both sides of the instruments, where applicable.

Allow me to emphasize again the confidentiality of the study, and to encourage you to please complete the final set of instruments at your earliest possible convenience, to ensure the validity of the study.

Completion of the instruments in this test package will conclude your involvement in the study. I would like to take this opportunity to personally thank you for your continued involvement in the study, and for your willingness to candidly allow me to share in such a personal and important part of your lives. If I can be of any further service to you or if you have any questions regarding the study or your participation in the research please feel free to call on me. I may be reached at the clinic through Jean (283-7531). Thank you again.

Sincerely,

Judith Daniluk

APPENDIX G

LETTER OF REQUEST FOR RETURN OF INFORMATION

Dear _____:

It has now been approximately three weeks since I forwarded to you the next set of test instruments that are a part of our infertility study. Unfortunately, we have not as yet received your completed forms.

If you have already mailed the test instruments back, would you please call me at the clinic (283-7531, Area 5), and let me know that they have been returned, as we have been experiencing some difficulty with our postal system. If you have not completed and returned the tests, please take a few minutes to do so, in order to ensure that the validity of the study is maintained.

If you have decided to withdraw from the research for whatever reason, I would also appreciate having the uncompleted instruments returned in the stamped and addressed envelope which was provided in the test package. In this way I will be better able to ascertain the needs and progress of this research project and its participants.

Thanking you in advance for your cooperation and participation in the study, I remain,

Yours sincerely,

Judith Daniluk, M.Sc.

APPENDIX H

LETTER TO PARTICIPANTS DROPPED FROM THE STUDY

January 3, 1985

Dear _____:

I am writing this letter for two reasons. First, the research study on the psychological and relationship consequences of an infertility investigation, which you have been participating in, has reached its conclusion. We now have the number of responses which we need to validate the study and will therefore be requesting that you do not complete the final two test packages at the points of diagnosis and six weeks post-diagnosis. It would be unfair of us to ask you to continue your participation in the study, when only those results received prior to the 20th of January can be included in the research at this time.

I would like to take this opportunity to thank you for your interest in the study and for the time which you have spent completing the questionnaires which are essential to the success of this research. Let me assure you that you will receive a condensed copy of the research results when the data has been analyzed and a final report has been written.

Thanking you again and wishing you success and happiness in the future, I remain,

Yours sincerely,

Judith Daniluk, M.Sc.

APPENDIX I

REQUEST FOR RESULTS

APPENDIX I

Dear _____:

I expect that we will have completed the study and collected all of the data by approximately January of 1985. If you are interested in receiving a condensed copy of the results of the research when the study is complete, please fill out the following information and return it with the test instruments in this package: (please print)

NAME: _____

ADDRESS: _____

_____

POSTAL CODE: _____

PHONE: _____

THANK YOU!