

**EXAMINING THE CONGRUENCE BETWEEN COUPLES' PERCEIVED
INFERTILITY-RELATED STRESS AND ITS RELATIONSHIP TO
DEPRESSION AND MARITAL ADJUSTMENT IN
INFERTILE MEN AND WOMEN**

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ABSTRACT

Recent studies have shown that the experience of infertility is linked with emotional responses such as depression, anxiety, guilt, social isolation, and decreased self-esteem in both men and women. This study explored the impact of congruence between couples' infertility-related stress and its effects on depression and marital adjustment in infertile men and women. Study participants were comprised of 525 couples referred to a university-affiliated teaching hospital for assessment and treatment with advanced reproductive technologies. Participants completed the Fertility Problem Inventory (FPI), the Beck Depression Inventory (BDI), and the Dyadic Adjustment Scale (DAS) three months prior to their first treatment cycle. The impact of differences between couples' perceptions of infertility-related stress were examined in relation to their effect on individual levels of depression and marital adjustment in both men and women. Results showed that differences between couple's evaluations of infertility-related stress were predictive of female depression, but not male depression. Women in couples who reported high levels of congruence (e.g., agreement) concerning the impact of infertility-related stress had significantly lower levels of depression when compared to couples in which females experienced a greater amount of stress than their partners. In terms of marital adjustment, men and women in couples who reported high levels of congruence concerning the impact of infertility-related stress reported significantly higher levels of adjustment when compared to couples who differed in their appraisals of the stress. Treatment implications based on these findings and future research directions are discussed.

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CHAPTER I

INTRODUCTION

Statement of the Problem

Infertility, or the inability to conceive or carry to live birth a pregnancy after one year of regular sexual relations without the use of contraceptives, affects one in six couples (17%) of childbearing age (Morin-Davy, 1998). The rate of infertility has increased 10% over the last 30 years. This has been attributed to several factors including delayed child bearing, the use of birth control and the increased prevalence of sexually transmitted diseases which affect fertility (McDaniel, 1992). However, other authors disagree that the use of contraceptives is a major factor (Insler & Lunefield, 1993).

Infertility is most commonly perceived to be linked with a female's inability to conceive. However, medical studies have shown that 40% of infertility is primarily attributable to female factors (e.g., tubal factors, endometriosis), 40% is attributable to male factors (e.g., low sperm count, impotence), and the remaining 20% to an interaction between the two partners (Robinson & Steward, 1996; Wright, Allard, Lecours, and Sabourin, 1989). Of the 20% related to interactional factors, 5-10% is not attributable to either partner. This type of infertility is referred to as "normal" "idiopathic" or "unexplained" infertility. Medical professionals also distinguish between primary infertility and secondary infertility, with primary infertility referring to those who have never had a biological child, and secondary infertility referring to people with one or more biological children, but who are currently unable to conceive.

Although infertility is primarily a medical condition, its diagnosis can greatly impact the emotional functioning of couples dealing with this problem. Infertility is often an unanticipated, stressful, and life changing event. Menning (1977) referred to infertility as a developmental

crisis that can threaten a couple's future goals, while Shaprio (1982) described the impact of infertility as a "brutal and unanticipated shock" (p. 387). Approximately 75% of couples diagnosed with infertility will seek some type of infertility treatment (Sadler & Syrop, 1998). Of those who seek medical treatment, it is estimated that fifty to sixty percent will eventually conceive, compared to only 5% who would conceive if they did not seek medical interventions (Andrews, Abbey, and Halman, 1991; Shapiro, 1982).

Medical treatments for infertility dramatically alter the couples' lifestyles and put a tremendous strain on emotional and financial resources (Braverman, 1997). Couples' normal life routines are replaced by "frequent sometimes daily visits to the doctor's office or laboratory for blood tests, ultra sound examinations, medications, injections, [or] surgery" (Callahan, 1994). Medical procedures for infertility range from treatment of endometriosis and reconstructive tubal surgery in the female, to treatments of disturbed sperm-cervical mucus interaction and surgical treatments in the male (Insler & Lunefeld, 1993). If treatments fail, however, couples' options include the use of advanced reproductive technologies (e.g., donor intrauterine insemination, *in vitro* fertilization, zygote intrafalopian transfer, surrogacy, or embryo adoption), adoption, or child-free living (Deveraux & Hammerman, 1998; Lieblum, Kemmann, and Lane, 1987; Menning, 1997). The infertility industry reportedly generates approximately 2 billion dollars per year (Braverman, 1997). Medical treatments are often costly and can also impose a great financial burden on the couple. For example, *in vitro* fertilization can cost from \$8,000 - \$10,000 *per attempt* at conception, with a success rate of approximately 19% (Braverman, 1997). Neumann estimated that a single birth using *in vitro* fertilization costs approximately \$40,000 (as cited in Braverman, 1997). Deveraux & Hammerman (1998) hypothesize that because of the

high cost of reproductive technologies, infertile couples face a great financial burden which limits the number of choices they have and contributes to the loss of control they often feel.

As little as 25 years ago, it was believed that emotional factors caused 40% - 50% of infertility cases (Seibel & Taymor, 1982). Infertile couples were believed to possess certain personality traits that resulted in their inability to conceive. However, recent studies have shown that only 5% of infertility cases can be related to psychological factors (Seibel & Taymor, 1982). Thus, researchers have been forced to re-examine their hypotheses and theories regarding infertility (Greil, 1997).

Research studies in the past 15 years have significantly advanced our understanding of the emotional impact of infertility on couples and individuals. Studies have shown that infertility is linked with emotional responses such as depression, anxiety, guilt, social isolation, and decreased self-esteem in both men and women (Abbey, Andrews, and Halman, 1991; Bolter, 1997; Connonly & Cook, 1987; Greil, 1997; Grover, Gannon, Sherr, and Abel, 1996; Hjemsteadt, et al., 1999; Morin-Davy, 1998; Myers, 1990; Newton, Sherrard, and Glavac, 1999; Sadler & Syrop, 1998). A significant number of studies have examined differences between men and women's response to infertility. Efforts have also been made to examine infertility's effect on couples' relationships showing that couples often differ in their response to the stress of infertility. However, no one has considered whether the nature or the extent of differences in a couple's response to the infertility impacts the spouses differently. Does depression or marital adjustment of the individuals in a couple tend to differ if they experience infertility-related stress to the same or different extents as their partner? Does the incongruence between spouses regarding infertility-related stress act as an additional stressor that results in greater symptomologies in both men and women?

In order to answer these questions, this study analyzed differences in perceived infertility-related stress within couples, and how these differences may affect individual symptomologies of depression and marital adjustment in infertile men and women. The study used the couple as a unit of analysis by examining differences between the couple in areas of perceived infertility-related stress. These differences were then examined to assess if they were a significant variable in explaining the variation of individually reported levels of depression and marital adjustment in infertile men and women.

Theoretical Framework

Family Systems Theory

This study was guided in part by the theoretical framework of family systems theory. Family systems theory began in the 1950s and was based in part on the concept of general systems theory proposed by Ludwig von Bertalanffy. Bertalanffy, a prominent biologist, promoted the idea that “every system was part of a subsystem of larger systems” and that science had “become reductionistic in its tendency to analyze phenomena by dissecting whole systems and studying their parts in isolation” (Nichols & Schwartz, 1998, p. 113). Systems theory proposed that by studying the individual parts of a system in isolation, the influence of the larger system was denied, thereby limiting the understanding of the outside context which influenced the individual part being studied.

The founders of family therapy, such as Bateson, Haley, and Minuchin, developed the concept of family systems theory based on the ideas of Bertalanffy’s general systems theory. They extrapolated the ideas Bertalanffy proposed for scientific phenomenon and applied them to human behaviors, believing that they were best understood within the context of a family system as opposed to being studied individually. Family systems theory postulated that, “certain

properties or behaviors in a system do not emerge from its component parts, but rather from the parts' specific arrangement in the system and from the transactions among them" (Spring, 1998, p. 8). Contrary to many of the theories in psychology, systems theory focuses less on the individual characteristics of members of a family, and more on the interactional aspects of family members and marital partners. Behaviors are understood by examining the processes that occur *between* people as opposed to processes which take place solely *within* the individual.

Because the experience of infertility is a shared problem between the members of a couple, it is best understood from a family systems perspective. In a longitudinal study on the effects of infertility on the marital relationship, Daniluk (1988) noted that the majority of participants in the study preferred to view infertility as a couples' problem and not a problem of an individual. Ulbrich, Coyle, and Llabre (1990) stated that, "since it is the couple that experiences involuntary childlessness, the infertility of one spouse will affect the other member of the couple in an interpersonal way" (p. 148). They also favored a "systemic perspective" when examining the issue of infertility and marital adjustment as they viewed the couples as an "interactive unit" (p.157). Greil (1997) noted that when studying the psychological consequences of infertility, "the individual's response is likely to be dialectically related to the response of that individual's partner. While from a medical point of view infertility is a physical condition of an individual . . . infertility is a shared reality of the couple shaped by both medical variables and by a specific social context" (p. 1699). And Andrews, et al. (1991) empirically supported this supposition by successfully testing their hypothesis that in infertile couples, each spouse's perception of their quality of life influenced the life quality of the other. By examining differences in the couples' perceptions of infertility-related stress, this study allowed aspects of

the couples' interactions and relationships to be evaluated as opposed to their isolated reports of the stress of the infertility.

Family Stress and Coping Theory

A theoretical framework utilizing family stress and coping theory was also used to guide the study's research questions and design. Stress has been defined "as a phenomenon that taxes the resources and capabilities of an individual or family, and which may be normative or catastrophic" (Spring, 1998, p. 10). Newton, et al. (1999) noted that, "stress has been conceptualized both as an event (a distressing circumstance external to the person) and as a response (the disruption of a person's normal state)" (p. 54). A third view proposed by Lazarus and Folkman (as cited in Stanton & Dunkel-Schetter, 1991) emphasized the relational aspects of stress focusing on the interactions between the event (environment) and the person (response). Similarly, Cohen (as cited in Newton, et al., 1999) proposed that stress was the combination of the perceived meaning of an event and the self-appraisal of the adequacy of one's coping resources.

The concept of family stress was developed in the 1930's with the studies of Angel, Cavan, and Komorovsky (Burr & Klein, 1994). In 1949, Hill built on these initial theories in a landmark study examining post-war family stress from which he developed the ABC-X model of family stress. This model has dominated the stress and coping literature for the past 50 years. According to the most basic tenants of the theory, "A" represents the stressor experienced by the family, "B" represents the family's resources that will be used to cope with the stressor, and "C" represents the family's perception of the stressor. Taken together, ABC combine to form X, or the severity of the crisis as experienced by the couple or family. This model was largely linear

and attempted to determine causal relationships between discrete stress related events (Burr & Klein, 1994).

For the past several years, researchers such as Boss, Patterson, and McCubbin have attempted to broaden the model to apply to a non-linear family systems approach (Burr & Klein, 1994). These researchers have attempted to evaluate family stress more as a process rather than as a discrete, linear event. For example, McCubbin and Patterson proposed the Double ABC-X model and introduced the concept of stress pile-up. This idea postulated that the “A”, or stressor experienced by the family, was not limited to a one-time stress-related event, but could include a ‘pile-up’ of simultaneous multiple stressor events. In addition, new stressors could be added to the family before the original stressors had been resolved, thus increasing the burden of overall stress in the family system (McCubbin & Patterson, as cited in Burr & Klein, 1994). This expansion of the theory lends itself well to working with families and couples experiencing multiple, unresolved stressors that are common when coping with infertility (e.g., treatment failures, family and social reminders).

A second addition to the ABC-X model is the expansion on the family perception component of the model (component C). Lazarus and Folkman (as cited in Stanton, 1991) proposed ideas regarding the interactional nature of stress, elaborating further on the complexities behind family perceptions of the stress related event. They discussed the importance of cognitive appraisals and coping processes, noting that there are two types of cognitive appraisals: primary appraisals and secondary appraisals. Individuals performing a primary appraisal ask, “what is at stake in this encounter?” Secondary appraisals ask, “what, if anything, can I do about it?” (Stanton, 1991, p. 89). Stanton (1991) notes that both types of appraisals are particularly relevant to couples experiencing infertility. For example, infertile

individuals and couples are likely to ask themselves what is at stake because of their infertility? If the answer poses a threat to an important life goal, or if the appraisal of infertility is viewed as “carrying a high potential for harm or little potential for benefit,” the individual or couple is likely to experience distress (p. 89). For secondary appraisals, it has been shown that when stressors were viewed as unchangeable or uncontrollable, adjustment to the stressor was more difficult (Folkman, Lazarus, Dunkel-Schetter, DeLongis, and Gruen (1986); Taylor (1983); as cited in Stanton, et al. 1991). Stanton noted that since infertility represents a loss of control in an area once felt controllable (being able to bear children), distress is likely.

Using the ABC-X model, the medical diagnosis of infertility represents “A” or the stressor experienced by the family. “B”, or the resources each couple possesses was not a focus of this study as data were not collected to examine resources the couple may have (e.g., financial, social and family support systems, etc). As a result, “C”, or the family’s perceptions or cognitive appraisal of the stressor, were a key element examined in this study. The “C” represented the couple’s reports of perceived infertility-related stress as measured by their responses to the Fertility-Problem Inventory (FPI, Newton, et al., 1999). Once these scores are determined, differences in the couple’s perception of the level of stress related to their experience were examined. The differences in the cognitive appraisals of the couple were then be examined in relation to X, which were represented by the levels of depression and marital adjustment each individual in the couple is experiencing.

When evaluating coping processes, the issue of family congruence is also important. Family congruence, originally discussed by McCubbin and colleagues, refers to “a sense of harmony among family members about the meaning they make of their situation and how to deal with it” (Snell & Rosen, 1997, 431). Snell and Rosen studied the coping processes of parents of

special needs children who had overcome past challenges and continued to face current difficulty as they raised their children. They found that parents who had successfully navigated the stress of raising special needs children generally had high levels of congruence among them. This finding confirmed the results of a previous study which found “higher levels of agreement about the meaning of a problem” predicted lower levels of stress (Patterson, 1993, as cited in Snell & Rosen, 1997, p. 432). Andrews and colleagues found that couples in crisis may be at “different points of adjustment” when dealing with the stress of infertility (e.g., one partner views the situation as highly threatening and stressful, while the other perceives it as a minor inconvenience.) However, we know very little about how these differences affect the couples’ subsequent symptoms resulting from the stress. This study further explored the issue of congruence between members of infertile couples to see if levels of congruence and agreement are related to individual outcomes of psychological distress (e.g., depression, marital adjustment).

Rationale

Infertility is a stressful, unexpected, and life changing event. Couples often respond with anger to the diagnosis of infertility. For most couples, the anger is a response to the helplessness and powerlessness they feel as they lose control over their life choices (Shapiro, 1982). Infertile couples have repeatedly scored higher on measures of psychological distress when compared to fertile couples (Daniluk, 1997). Shapiro (1982) hypothesized that the indirect channeling of anger over infertility caused marital tension to surface in areas the couple had previously handled adequately. However, other studies have shown that infertile couples do not report any difference on measures of marital satisfaction when compared with fertile couples (Sabatelli, Meth, and Gavazzi, 1988). For these couples, it is hypothesized that the experience of

infertility may act as a bonding between partners. Couples in this situation may view the infertility as a challenge they can overcome together.

Addressing the Gaps in the Research

Greil (1997) recently conducted an exhaustive review of the literature regarding infertility and psychological distress over the past twenty years. As recently as 1986, only 30 controlled studies of the psychological implications of infertility had been conducted. However, this shortage of relevant research has been supplanted by a wealth of both quantitative and qualitative studies examining the issue over the past 14 years. During this time, at least 94 quantitative articles and 26 qualitative articles have been published on this topic.

Greil also noted that although there has been a significant increase in the number of studies examining the psychological implications of infertility, there have been relatively few studies which examine the couple as the unit of analysis (Andrews, et al. 1991; Draye, Woods, and Mitchell, 1988; Hirsch & Hirsch, 1988; Sabatelli, et al. 1988; Stanton, Tennen, Affleck, and Mendola, 1991; Ulbrich, et al. 1990). Andrews, et al. (1991) found a positive relationship between fertility problem stress reported by the wife and fertility problem stress reported by the husband, but showed that members of the same couple may experience different levels of fertility problem stress. This finding is particularly important to this study as it shows that differences do exist in couples with regard to fertility perceived stress. However, how these differences affect the individual symptomology of both men and women within the couple remains to be studied. This study was the first known effort to attempt to explain the relationship between couple differences related to infertility-perceived stress and its effects on individual outcomes of depression in infertile men and women.

This study was significant in that it fills a need not only for the research base in marriage and family therapy, but also for the stress and coping literature. Stanton noted that “few studies have examined couples who are coping with the same stressful encounter. Rather, most studies that have sampled married couples have not requested that their respondents refer to the same stressful experience” (Stanton, 1991, p. 100). This study attempted to fill this gap by examining couples in which both partners are experiencing the stress related to infertility. If findings from the study show that differences in perceptions between partners regarding their perceived infertility-related stress are connected with the symptoms of depression, clinical interventions based on enhancing couple congruence could be developed. Furthermore, additional research could be conducted to further explore the important relationships discovered from these findings.

Past research efforts related to infertility have been limited by the following characteristics: 1) overemphasis on women; 2) small sample sizes; 3) primitive statistical techniques; 4) heavy reliance on self-report which increases the chances of social desirability bias (especially in infertile populations as they attempt to appear “normal” so that healthcare professionals will treat them medically as opposed to psychologically); and 5) non-representative samples (Greil, 1997). This study addressed three of these limitations by emphasizing men and women equally by examining perceived-stress in the domain of the couple relationship. It also utilized adequate sample sizes which lent itself to more advanced statistical tests. However, the study used self-report measures and also suffer from lack of representativeness as study participants were volunteer couples receiving advanced reproductive treatments at an infertility clinic.

Research Questions

This study attempt to answer the following research questions:

1) How is the level of congruence between husbands and wives' scores on infertility stress indicators related to individual measures of depression and marital satisfaction in infertile men and women? To what extent do men and women in couples with low levels of congruence (e.g., disagreement) about the meaning of infertility score higher on measures of depression than couples who report higher levels of congruence (e.g., agreement)?

2) Are differences between members of a couple on measures of perceived infertility-related stress predictive of depression and marital adjustment in men and women? Are differences among certain types of perceived stress (as measured by the five sub-scales on the FPI) more likely to predict higher levels of depression and lower levels of martial adjustment than others?

CHAPTER II

LITERATURE REVIEW

Historical Review

The earliest published research examining the link between psychological distress and infertility began in the 1950's. Fisher (1953, as cited in Insler & Lunefeld, 1993) stated that, "psychogenic infertility can be defined as sterility in a couple in whom no pathology or dysfunction can be demonstrated by any method available to us today" (p. 3). Labandiabar (1959) and Kostic (1960) (as cited in Seibel & Taymor, 1982) examined the possible relationship between sterility and frigidity. Eisner (1963) sought to understand the perceived psychological differences between fertile and infertile women using a Rorschach test with 20 infertile females. She noted that all of the women exhibited emotional disturbances and concluded that between 40-50% of infertile cases were caused by emotional factors. Other researchers at this time believed that infertile men and women showed signs of psychosexual maladjustments (Dawkins & Taylor, 1961; Sandler, 1959, as cited in Seibel and Taymor, 1982).

Studies examining this hypothesis continued into the 1970's. Mai and Rump (1972) studied whether infertile men and women were neurotic. Mozley (1976, as cited in Seibel and Taymor, 1982) proposed that infertility could be caused by unconscious motivations on the part of the infertile individual and that infertility "could be considered a defense against dangers inherent in the reproductive functioning" (p. 137).

These studies formed the basis of the psychogenic hypothesis which proposed that infertility was caused by the psychological and personality characteristics of men and women. Researchers continued to adhere to this theory up until the mid 1980s. However, as infertility increased in its prevalence, more research was conducted, and the hypothesis was examined

more closely, it was found that the most carefully designed studies revealed no differences between the personality traits of infertile women compared to non-infertile women, and where differences were found, it was impossible to link the cause of the difference to the infertility (Greil, 1997).

The literature advocating the psychogenic hypothesis was limited by several factors including “failure to use systematic measures combined with an over-reliance on clinical impression, . . . a virtually exclusive focus on female’s infertility, and assumptions of the direction of causality without any clear evidence” (Greil, 1997, p. 1680). These factors contributed to a false impression that infertile men and women were responsible for their own infertility on account of their psychological attitudes and personality characteristics. Seibel and Taymor (1982) were among the first to report that advances in neuroendocrinology and other medical technologies revealed that only approximately 5% of emotional factors were directly related to infertility in men and women. In relation to the psychogenic hypothesis, they commented, “although many authors have noted increased psychological problems among infertile couples, few have provided evidence that these problems were a cause of infertility rather than the result of it” (p. 144).

In 1989, Wright and colleagues reported that through 1986, only 30 controlled studies had been conducted examining the link between psychological distress and infertility. However, since the mid 1980’s, there has been a significant increase in the amount of research addressing this issue. As noted earlier, Greil (1997) reported that over the past twenty years a minimum of 94 quantitative articles and 26 qualitative articles have been published examining psychological distress and infertility. These studies have specifically addressed the issues of the personality differences between infertile and non-infertile men and women, differences in distress between

infertile and non-infertile men and women, longitudinal studies of infertility distress, and gender differences in the experience of infertility. Although these studies are not without their limitations, namely the use of convenience samples and an overemphasis on women, they have provided a rich theoretical base from which to study the link between infertility and psychological distress.

The following literature review examined many of the articles which link psychological distress to infertility, giving special attention to those which examine the couple as the key unit of analysis. The review also examined the specific link between infertility and depression, the effect of infertility on couple and marital relationships, and how men and women differ in their emotional responses to the stress of infertility. A brief review of the research regarding the influence of infertility diagnosis was also included.

The Impact of Infertility on Psychological Functioning

As stated earlier, research studies in the past 15 years have advanced the literature base regarding the emotional impact of infertility on couples and individuals. Several studies have confirmed that infertility is associated with emotional responses such as depression, anxiety, guilt, social isolation, and decreased self-esteem in both men and women (Abbey, et al., 1991; Greil, 1997; Sadler & Syrop, 1998). Although the association between infertility and these emotional disturbances has been shown, there has been little research examining the specific nature of these variables in relation to infertility. Methodologic limitations such as flawed study designs and small sample sizes have limited the effectiveness of researchers in examining this issue.

Connolly, Edelman, Cooke, and Robson (1992) conducted a key study exploring the impact of infertility on psychological functioning. Using 116 couples recruited from an

infertility clinic, participants completed the Eysenck Personality Questionnaire (EPQ), the General Health Questionnaire (GHQ), the Beck Depression Inventory (BDI), the State-Trait Anxiety Inventory (STAI), Dyadic Adjustment Scale (DAS), Interpersonal Support Evaluation List (ISEL), and BEM Sex Role Inventory (BSRI).

Analyses were conducted using three stepwise multiple regression analyses to determine the best predictors of psychological disturbances in both men and women. For males, the only predictor was a diagnosis of male-factor infertility which was predictive of increased anxiety. For females, increased interpersonal support was predictive of lower anxiety, and trait anxiety was related to depression. Additional analyses were conducted using multifactor analysis of variance for depression, general health, and the quality of the couple's relationship, using within subject variables of time and between subject variables of diagnosis and gender. Participants' depression scores were analyzed among five sub-groups (male factor diagnosis, female factor diagnosis, male and female causes, unexplained, and pregnant) at the initial and the follow-up assessments. The authors noted that "the scores show little evidence of change over the intervening period, and in general they are low (e.g., not highly depressed). There is a significant gender difference, which would be expected on the basis of population data which shows that females generally have higher depression scores [than men]" (p. 463). Analysis of marital adjustment revealed that scores "remained relatively constant between the assessments with no indication of any significant differences" (p. 464). The authors concluded that the two major findings from the study revealed first, there was "little evidence of psychopathology" in study participants for the first seven to nine months of infertility treatments. Second, they concluded that marital relationships of infertile couples pursuing infertility treatments were

relatively stable. Indicators of lower depression scores in the study were in conflict with other findings (Link & Darling, 1986, as cited in Connolly, et al. 1992).

In a recent qualitative study, Williams (1997) examined the psychological effects of infertility on women. Five women were interviewed in a pilot study and 10 women were interviewed for the research study. Williams conducted open-ended interviews and used inductive methods of analysis. She found that 11 themes emerged universally from the women participating in the study: negative identity, worthlessness/inadequacy, lack of personal control, anger/resentment, grief/depression, anxiety/stress, lower life satisfaction, envy of other mothers, loss of the dream of co-creating, emotional roller coaster, and isolation. With regards to grief and depression, each woman noted that every menstrual period represented a “loss that was irretrievable, that pushed them closer to the end of their hopes” (p. 15). Women reported grieving and feeling a loss that was incomparable with any other they had experienced in their lives. Williams reported that many of the women presented symptoms of clinical depression including insomnia, fatigue, change in eating patterns resulting in weight loss or gain, and feeling helpless and hopeless. Many of the women refused to take credit for other accomplishments in their life and still took responsibility for the infertility, even when it was diagnosed in the husband.

Infertility and Depression

In the general population, major depression is twice as prevalent in women as it is in men (Llewellyn, Stowe, and Nemeroff, 1997). Many authors have reported that depression is a common consequence of infertility (Domar & Seibel, 1990; Leader, Taylor, & Daniluk, 1984; as cited in Domar, Broome, Zuttermeister, Seibel, and Friedman, 1992). However, the exact nature of this relationship has been understudied (e.g., severity, directionality). Only a few articles exist

that directly examine the relationship between depression and infertility. While these findings are helpful in furthering our understanding between these variables, the majority of studies examining infertility and depression have been limited to female populations.

Domar and colleagues (1992) conducted a study examining the prevalence rates and predictability of depression in infertile women. Three hundred seventy-six infertile participants were recruited for the study from an infertility treatment center. A control group of fertile women was obtained through patients from a hospital based gynecological practice. Participants were asked to complete two depression measures, the Center for Epidemiological Studies Depression Scale (CES-D) and the Beck Depression Inventory (BDI). The CES-D scale “was specifically designed for research. It is intended to measure symptoms of depression rather than general distress” (p.1159). The BDI was used to measure the “intensity of depression” among study subjects. Participants were also asked to complete a demographic form measuring age, duration of infertility, length of infertility treatments, past treatments, primary or secondary infertility, infertility diagnosis, and history of psychotherapy. To appropriately assess depression levels in study subjects, “cut off scores of 16 for the CES-D and 9 for the BDI were utilized to indicate the presence of depression symptoms, according to the respective test guidelines” (p. 1160).

Study results indicate no significant differences between infertile women and fertile women with regard to demographic variables. However, the mean BDI score of infertile women (8.3) was significantly greater than that of the control group (5.1). Comparisons between the two groups were also significant when measured by the CES-D. Compared with control subjects, a significantly greater percentage of infertile women scored in the depressed range on the BDI

(37% compared to 18%). It was also noted that none of the control subjects reported depression levels greater than 18, while 8.4% of infertile women scored above 18.

Demographic variables that influenced depression outcomes included a history of infertility-related surgery (higher BDI) and a history of psychotherapy prior to infertility treatments (higher BDI). Duration of treatments was also related to depression as women in the 2-3 year range of treatments reported significantly higher levels of depression than women with durations of less than one year or greater than six years. Diagnosis was also predictive of depression. Women with female, male, or combined diagnosis reported significantly higher BDI scores when compared with women with unexplained or undiagnosed infertility. There were no significant differences between male and female factor diagnosis. These findings showed that “depression is apparently a very common and significant problem in infertile populations” as infertile women consistently reported higher levels of depression than women in the control group according to a number of variables (p. 1161).

Downey and McKinney (1992) conducted a study examining the psychiatric status of women presenting for infertility evaluation. The authors recruited 118 infertile women and 83 women in a control group to participate in the study. Participants completed the Reproductive Functioning Questionnaire, the Ideas About Your Future Questionnaire, the Attitudes of Family Questionnaire, The Partner Relationship Satisfaction Scale, the Sexual Behavior Scale, The Concept Scale, The Brief Symptom Inventory, and the Mood Disorder Questionnaire. Although not statistically significant, the authors noted that 11.0% of infertile women in the study met criteria for a current major depressive episode compared to only 3.6% of the control group. Infertile women and women in the control group experienced depression similarly. Although apparently contradictory to Domar’s (1992) findings, it is difficult to make comparisons between

studies that use different methods such as use of different data collection instruments (BDI and CES-D compared with the Brief Symptom Inventory and the Mood Disorder Questionnaire).

In a rare study examining the potential association between a history of depressive symptoms and the increased risk of infertility in women, Lapane et al. (1995) collected data from the household health survey of the Pawtucket Health Program (PHHP) – a biannual study conducted between 1981 and 1990. One age-appropriate respondent from randomly selected households was asked questions by trained interviewers regarding their medical history (e.g., presence of cardiovascular disease, blood pressure, and history of medication use). The study selected a sub-sample of 2,920 women ages 18 to 45 who participated in the PHHP and sent them a data collection instrument measuring their history of depressive symptoms, antidepressant medication use, history of sexually transmitted diseases, and history of infertility. Logistic regression revealed that, “a history of depressive symptoms was associated with a two-fold increase in risk for infertility” (p. 511). These results were similar to a study, which found that women who were “unable to conceive after 12 month of unprotected intercourse were twice as likely to report a history of depressive symptoms prior to attempting to conceive as women who were successful in conceiving within a 12-month period (Wagner & Berenson, 1994, as cited in Llewellyn, et al., 1997). Lapane and colleagues noted the methodologic shortcomings of the study including potential misclassification based on self-report, confounding variables that could be the result of instead of the cause of infertility, and an extremely low response rate of 14%. Further study is needed to address the directional link between infertility and depression.

Role of Gender in Response to Infertility

Wright et al. (1991) conducted a large-scale study examining the differences in men’s and women’s responses to the stress of infertility. They studied 449 volunteer couples at a

fertility clinic in Montreal, Canada. Couples participating in the study completed the Index of Psychiatric Symptom Inventory (Ilfeld), (a 29-item scale measuring depression, anxiety, cognitive disturbances, and anger), the Rosenberg Self-esteem scale, the Psychological State of Stress scale, the Dyadic Adjustment Scale, the Index of Sexual Satisfaction, and the Inventory of Socially Desirable Responding. Data collection was conducted at six-month intervals over a two year period, thus qualifying the study for longitudinal status. However, at the time of publication, the longitudinal analyses were not yet complete.

The researchers conducted two-tailed *t*-tests to compare the responses of men and women. Findings showed that women experienced “significantly more psychological distress than their partners on the total score of the Index of Psychiatric Symptomatology and the four subscales: depression, anxiety, cognitive disturbances, and hostility” (p. 104). The women also reported lower levels of self-esteem and greater overall psychological stress.

Wright also reported that on average, infertile men and women reported greater overall psychological distress than men and women in the general population. Further comparisons revealed that 25% of women and 17% of men in the sample scored above the cutoff point on the global index of Psychiatric Symptomatology, compared to 19% of women and 11% of men in the general population. The findings suggest that men and women in infertile couples experience higher levels of depression, stress, and anxiety when compared to their counterparts in the general population, with women experiencing a more symptoms than men.

Abbey, et al. (1991) examined the role of gender in response to infertility. They conducted in-person interviews with husbands and wives in 275 couples (550 individuals) recruited from infertility specialists, Resolve, the Endometriosis Association, newspaper advertisements, and referrals from study participants. A comparison group of 90 couples were

who were presumed to be fertile was also used in the study. Couples were asked to complete measures related to stress, home life performance, well being, attributions and control, perception of meaning and positive benefit, social relationships, coping, and degree of confidence they had that they would become biological parents.

The results from their study confirmed those of many others, namely that “wives perceived their infertility as significantly more stressful than their husbands” (p. 304). They also found that infertile women were more likely to be involved in problem-solving and escape coping, and were also more likely to attribute greater responsibility to themselves for infertility than did their husbands. With regards to control, infertile women were more likely to perceive greater control over the infertility than did men. When compared to the control group, infertile men and women reported lower levels of self-esteem and significantly higher levels of depression than couples presumed to be fertile, supporting the findings from other studies which report that overall, infertile men and women experience higher levels of psychological distress than couples presumed to be fertile.

The following sections detail specific emotional responses in men and women to the stresses of infertility summarizing findings that have examined this issue relative to both genders.

Female Emotional Response to Infertility

Infertile women, compared to infertile men, experience greater psychological distress, lower self-esteem, and higher levels of depression (Daniluk, 1997, Wright, et al, 1991). In addition, their marital and sexual satisfaction is likely to decrease once they begin dealing with the crisis of infertility (Sadler & Syrop, 1998). Several studies have been conducted examining the psychological profiles of infertile women compared to fertile women. Research results have

often been mixed in their findings, depending on the studies methodologies and the limitations in the study designs. However, there is consensus that negative factors such as depression, loss of self-esteem, and grief are all commonly experienced by infertile women. Connolly reported that women in infertile couples were more prone to anxiety, more introverted, and more likely to experience feelings of guilt than women in fertile couples (Connolly & Cooke, 1987).

In an effort to better understand the emotional aspects of infertility on females, Daniluk (1997) conducted a qualitative study in which she interviewed several women to gain their insight from the experience. One woman commenting on her infertility explained:

Infertility challenges everything. . . . Your beliefs about yourself, about what's important, about marriage, about what is fair and just, about God. Being infertile makes you question the purpose of marriage and of life. . . . nothing is left unaffected by this experience. . . . it changes you, subtly but profoundly. . . . I think that the biggest thing that we've had to work through as a couple and me as a person is just leaning to live with it. . . . because it changes everything. . . . being infertile changes everything (p. 117).

Downey and McKinney (1992) reported that the majority of women participating in a study of infertility reported negative changes in their psychological functioning. Seventy-five percent of the women reported noticeable changes in mood, almost half reported changes in sexual functioning, and over one-third reported decreased levels of self-esteem. The study hypothesized that, over time, a proportion of women who do not conceive will experience psychiatric symptoms and/or depression directly related to their infertility.

One woman speaking of the extreme nature of the infertility experience related:

The second I am up in the morning the thermometer is in my mouth, and I lay like a corpse fearful that the slightest movement, even a breath, will affect the temperature reading. Of course, from there my mood goes up or down with the reading. My life revolves around scheduled appointments to have sex, scheduled appointments with specialists, and contrived scheduled events designed to avoid bumping into anyone who might be happy. Just the simple question "how are you?" makes my emotions well up with an intensity that scares me. I am exhausted. Everyday I face myself in mirror and wonder how my life got so hard to deal with. I wonder, too, how long I can keep up the

façade that everything is fine, even though my life feels so empty. I hate my obsession to get pregnant and yet it is genuinely all I care about. And I hate to think of what my husband thinks of the mess he is married to. I just have no idea what to do with myself (Deveraux & Hammerman, 1998).

Women commonly attribute infertility to biological failure or past behaviors such as abortion or extramarital affairs, even when the couple received a male infertility diagnosis (Daniluk, 1997). Women often perceive their inability to conceive as a direct reflection on their identity and their self-image, especially as competent, successful women (Daniluk, 1997). Women are also more committed than males in pursuing medical treatments to achieve the goal of biological parenthood (Greil, et al. 1988).

Infertility appears to be a much more distressing in the lives of women when compared to men. Freeman (1985) reported that while 50% percent of women consider infertility the most distressing experience of their lives, only 15% of men answered similarly. In cases where the cause of infertility is undetermined, women are more likely than men to attribute it to themselves (Robinson & Stewart, 1996). Qualitative interviews show that women often report a great difficulty adjusting to the loss, as well as higher levels of depression, anger, and loss of self-esteem (Greil, et al. 1988). One woman reported:

It was as if a part of me had died, a part of me was never going to be fulfilled. Grieving to hold a baby. A part of me felt like I was never going to be, a part of me felt like a major disappointment to everybody. I think that was the hardest thing. I felt like I had disappointed my husband, I disappointed my parents, I disappointed his parents, and I disappointed myself (p. 180).

Perhaps one of the reasons the impact of infertility is so great for women is because of their biological makeup. For approximately thirty years, the female body is in a continuous cycle of preparing itself for pregnancy through the monthly cycle of menstruation. Thus “women are reminded on a monthly basis of their biological role in procreation” (Deveraux & Hammerman,

1998, p. 66). However, as a woman attempts to conceive, the menstruation period serves as a monthly reminder of her failure to do so. Because of this, women may experience greater emotional distress as their bodies not only remind them of their role in procreation, but also their failure to accomplish their biological goal.

Isolation is also common in women experiencing infertility. Many women will remove themselves from social interactions involving expectant mothers or mothers with young children. Infertile women often view the majority of women they see or interact with in social situations as being pregnant or having small children (Deveraux & Hammerman, 1998). Robinson and Stewart (1996) reported that women often feel guilty due to feelings of envy or anger towards pregnant women or women with children. Several studies have shown that especially for women, isolation is one of the greatest barriers to successful coping and adaptation. Women who are less socially isolated have reported higher levels of life satisfaction and have employed more adaptive coping skills in response to stress associated with infertility (Daniluk, 1997).

Bergart (1997) examined how women view their lives after infertility treatments fail. She conducted semi-structured interviews with women after they had stopped infertility treatment. Ninety percent of respondents indicated they still hoped for pregnancy, and most said that their marriages and other relationships had been stressed by infertility. Women who stopped treatment less than one year prior to the interview still experienced pain and sadness over the loss and experienced anger about childlessness, and many reported having a fear of the future without children. Many women reported avoiding young children, although women who had been out of infertility treatment over a year and a half reported better adaptation. Women in this category attempted to redefine their identities and attempted to develop "nurturing outlets," especially in

relationships with children. Women who had recently stopped treatment continued to avoid pregnant women and young children.

Bolter (1997) studied the ways in which a woman's coping strategies and defenses were linked to her ability to adapt to infertility. Women's initial coping strategies included hopefulness, obsessiveness, magical thinking, blame, and humor. Study subjects were asked to complete several self-report measures which assessed their level of functioning after a diagnosis of infertility, including the Beck Depression Inventory and Reactions to Infertility Questionnaire. Results showed three different forms of coping styles: action, hope, and detachment. Action was positively correlated with depression, anxiety, and distress, while detachment was positively related to self-esteem but negatively related to depression, anxiety, and distress. The study showed that the most important indicator of depression, self-punishment, and low-self esteem was a woman's avoidance of pregnant women and young children.

Male Emotional Response to Infertility

Male emotional response to infertility has been studied less than female emotional response. This is a documented and recognized limitation in the infertility literature. Daniluk (1997) reports that in the few studies that have been conducted, it has been shown that the news of infertility for the couple is as distressing for the man as it is for the women. However, results are mixed when compared with other findings (Robinson & Stewart, 1996). In a study interviewing 22 men diagnosed with male infertility, Mason (as cited in Daniluk, 1997) reported the men experienced feelings of guilt, shame, anger, isolation, loss, and personal failure. When diagnosed with infertility, males attributed more negative characteristics to themselves than males not diagnosed with infertility using terms such as "useless", "failure", or "defective".

Men are often non-communicative in their response to the painful emotions associated with infertility. As a result, many women may not realize their husbands are experiencing these emotions. Studies have indicated that males were much less likely than females to confide in others regarding infertility (Daniluk, 1997). In addition, because men are unable to solve the problem of infertility, they often feel helpless and unable to cope with the situation. As a result, they find it difficult to discuss their feelings related to the infertility. In a qualitative study conducted by Daniluk (1997), men's responses to infertility were described in the following terms:

I did not want to seriously examine my feelings because I did not want to face the feelings of pain, sorrow, disappointment and inadequacy . . . and I did not want to hear my wife's feelings of pain and anger about my infertility. . . a lot of it was not having the ability or the honesty to know what I was feeling.

I still think that it's somewhat within my power to do something that could help my wife. And I'm frustrated that I can't. I'm really frustrated that I can't solve [our] problems or contribute to the solution of them for [us].

Seibel and Taymor (1982) estimated that up to 10% of infertility is directly related to, or has its origins in male impotence or other sexual dysfunction. In addition, impotence is a common side effect of male infertility, further complicating the issue. Berger (as cited in Daniluk, 1997) reported that in an interview with 16 couples experiencing infertility, 63% of males had experienced a temporary impotence lasting one to three months. Irvine and Cawood (1996) reported that male infertility threatens the traditional male/father role and leaves males feelings sexually inadequate. As a result, men may avoid such feelings by throwing themselves into their work or having extramarital affairs.

Males diagnosed with infertility commonly report loss of self-esteem. Meyers (1990) reported that men diagnosed as infertile became reflective and withdrawn, obsessing about being

defective and questioning their identity. Connolly & Cook (1987) found that male infertility was clearly associated with an increase in marital problems as seen by both the man and the woman. They speculated that this was likely associated with the husbands loss of self-esteem as “infertility and virility become intertwined for the infertile; a man who is unable to father a natural child may feel that others doubt his masculinity” (p. 56). In a longitudinal study conducted with infertile men, Grover et al. (1995) reported that infertility was highly correlated with increased anxiety and distress, and that males were also likely to blame themselves for their fertility problems -- often feeling “less of a man” because of them (p. 31). They suggested that their findings showed male distress may be more “related to the threat to their manliness than the absence of a baby” (p. 33).

Social Considerations

The influence of culture plays an enormous role in male and female responses to infertility. Parents, family tradition, social norms, and religion all play an important role in the transmission of values and gender roles to children. Cultural and gender distinctions are made between boys and girls from the moment they are born. Young children are given toys directly related to the roles of fatherhood and motherhood. Girls are commonly given toys related to nurturing, femininity, and caring such as dolls, cooking ware, and cleaning ware; while boys, on the other hand, are given more “manly” toys such as trucks, sporting equipment, and construction sets (Deveraux & Hammerman, 1998). Furthermore, girls are often rewarded when they exhibit caring behaviors, while boys are rewarded for their toughness and ability to take things “like a man.”

Abbey et al. (1991) noted that differences in male and female responses to infertility may "reflect general gender differences in the ways in which men and women have been socialized"

(p. 298). Although both men and women are socialized in regards to parenthood, several authors speculate that this socialization process may place more of an emphasis on the females role in motherhood as opposed to the male's role in fatherhood. Chodorow and Rich (as cited in Daniluk, 1997) noted that although both men and women believe that parenthood is a "developmental milestone" in their lives, society prescribes motherhood as *the* defining role for women in society. Daniluk (1997) further stated that even though in our culture "more options are becoming available for women, motherhood is still the primary defining role for women in our society" (p. 112). For women immersed in this cultural belief system, infertility is no longer a medical diagnosis, but a definition of themselves. Thus, "the most debilitating effect of infertility is that it strikes at the very core of the female identity" (Williams, 1997, p. 11).

Although fatherhood is not as central to the male identity, males are not exempt from the influence of social culturalization. The essence of masculinity, as taught by society, is a man's ability to demonstrate strength, virility, and potency. However, the infertile man fails to demonstrate these characteristics. As a result, male clients typically report feeling the loss of their identity as a man, a husband, and as a potential father, both by society and by themselves. In essence, they are faced with a potential loss of their manhood (Deveraux & Hammerman, 1998). Thus, infertility also attacks the core of the male identity, but in a slightly different way than it does for females.

Infertility places a barrier between the couples and their ability to fit into the gender roles prescribed by their culture. Women who are infertile have no ability to meet the cultural expectation of motherhood, and men who are infertile have no ability to demonstrate the culturally taught aspects of their manhood. This questioning process is potentially linked with the couples' feelings of loss and depression. Not only has the couple lost their expectation and

hope of having a biological child, but they have also lost a part of themselves as well. Their personal identity, which they have formed over the course of their lives, is now in question.

In addition to the direct attack on one's identity, couples frequently experience a change in their interpersonal relationships and social interactions. Daniluk (1997) stated that for many women:

friendships with other women are dramatically altered when these women become mothers, and caretaking, domestic responsibility consume the space that was once reserved for their friendships . . . Thus, women in this situation must not only cope with the loss of being unable to produce a child, they must also deal with the pain of being excluded from the lives of significant women in her life who have made the transition into the world of motherhood (p. 112).

However, this loss of social relationships does not seem to be as great for men. When studying this phenomena, Daniluk noted that even though several of the men's friends made the transition to fatherhood, their social interactions remained relatively unchanged. Thus, the loss of social support and structure does not seem to be as great for males as it does for females.

Diagnosis

Studies attempting to establish a link between the attribution of an infertility diagnosis (e.g., male factor, female factor, combined infertility, or unexplained) and psychological distress have been inconclusive. Greil (1997) suggests that the majority of studies examining infertile diagnosis showed it did not affect the psychological distress levels of men or women. However, conflicting findings have been found (Connolly & Cook, 1987; Domar, et al., 1992). For example, Newton et al. (1999) found that infertility diagnosis had "a significant multivariate main effect" on individuals' perceptions of perceived social and sexual stress. However, Stanton et al. (1991) reported that infertility-related distress did "not vary as a function of locus of causation of infertility (e.g., male factor vs. female factor)" (p. 12). Although diagnosis may

play a significant part in infertility-related stress for some individuals, it does not seem to universally apply to all men and women experiencing infertility.

Nachtigall, Becker, & Wonzy (1992) conducted a qualitative study of 36 couples in infertility treatment examining the effects of gender-specific diagnosis on men and women's response to infertility. Both men and women were interviewed together as men's participation was typically contingent on being interviewed with their wives being present. Interviews were typically two hours or more and were conducted using semi-structured interview guides. The interviews were coded by variables such as age, gender, infertility factor, and length of infertility. Traditional qualitative methods were employed for the study analysis.

Study results indicated that, "no differences were found among women in their emotional response to infertility regardless of whether or not a female infertility factor was present (p. 116). Women in such instances reported feeling stigma, loss, role failure, and loss of self-esteem regardless of diagnosis. However, for men, feelings of stigma, perceptions of loss, role failure, and loss of self-esteem were only reported when the man was diagnosed with male factor infertility. When it was a combined diagnosis or female factor infertility, men were highly unlikely to report stigma, perception of loss, role failure, or loss of self-esteem. The authors concluded that, "men's response to infertility will closely approximate that of women if the infertility has been attributed to a male factor but will be significantly less if a male factors is not found" (p. 118).

The Effect of Infertility on the Couple Relationship

Infertility often comes as an unexpected shock to most couples. For many, having children is not a question of if, but when. One woman commenting on this issue noted:

Six years ago my husband and I got married. We knew that children would definitely be a part of our lives. The question was not if, but when. We waited several years to let me use my college degree, to buy a house, and to establish a good foundation before we brought children into the world. . . . I sit here six years later. I have a wonderful husband, established roots, the house of my dreams, years of teaching experience. But the children we had longed for are denied us (Menning, 1980).

Greil, et al. (1988) found that differences in the way couples commonly view infertility can lead to tension and anger in marital relationships. One woman in their study stated, “I was angry at him, because I didn’t think it really affected him like it did me. I just felt that his life was good and my life wasn’t” (p. 188). A man in the same study commented, “[My wife] would get upset with me, saying ‘you don’t really seem to care, you don’t seem to take interest in this. How come you don’t read the newsletters from Resolve? Don’t you care about this whole thing?’” (p. 188). Freeman, et al. (1985) reported that almost 50% of women considered infertility the most distressing experience of their lives, compared to only 15% of men. Greil, Gannon, Sherr, and Abel (1988) found that wives considered infertility an enormous role failure, while husbands perceived infertility as a “disconcerting event, but not a tragedy” (p. 181).

Infertility and Marital Adjustment

Several studies have been conducted examining the link between marital adjustment and infertility. Although there has been a general consensus that infertile individuals and couples are generally more distressed than those presumed to be fertile, there has been some disagreement whether infertility related stress has a negative effect on couples’ marital relationships. Several researchers propose the stress related to infertility causes a depletion in the resources of a marriage, uncovering problems that might not have been addressed and adding an unmanageable burden on the couple (Andrews, et al. 1991; Greil, 1997). In these instances, the couple typically relies on each other for support. However, a second group of researchers report that infertile

couples have above average levels of marital satisfaction hypothesizing that infertility acts as a challenge that brings the couple closer together and opens up new lines of communication and problem solving (Callan, 1987). This section present findings from both types of studies.

Shapiro (1982) was one of the first authors to write about the impact of infertility on marital relationships. Writing from a developmental perspective, he noted infertility was a, “unanticipated shock for most married couples” (p. 387). He proposed that infertility could be viewed as a crisis, or a “turning point that offers the opportunity for regression or for growth” (p. 387). He noted that crises’ are situations that are perceived as a “threat, loss or challenge” and typically occur after the normal coping strategies and resources of the couple have been depleted (p. 388). He hypothesized that couples typically mourn the loss of their expectations to have a child and commonly pass through the stages of grief: denial, anger, grief, and acceptance. He proposed ways in which counselors may help infertile couples at each stage in the grieving process, and suggested that grief resolution was a necessary component in resolving marital difficulties associated with infertility.

Connolly and Cook (1987), conducted a large-scale longitudinal study on infertility-related distress and marital problems noting that there was a lack of systematic data available to address this issue. They examined 843 couples who were patients at an infertility clinic between 1975 and 1985. Participants completed a survey inquiring about the provision of medical advice, the counseling needs of the couple, and the evaluation of distress and marital problems that were related to the infertility.

To examine the effect of infertility on marital distress, a one-way analysis of variance (ANOVA) was used to compare groups by diagnosis of infertility. Results showed that male factor infertility created more marital difficulties than when the infertility was attributable to the

female or both partners. *T*-tests compared couples by the length of time they had been in treatment and the effect it had on marital distress. The authors noted that the, “only significant score was the level of female distress to the level of female tests” (p. 54). Results also found that the longer men were in treatment, the more likely they were to report feelings of guilt and anger. Although the study had inherent limitations such as the use of an un-standardized measure, the authors were startled at the findings regarding male factor infertility and its effects on the marital relationship, noting that “it is clearly associated with an increase in marital problems as seen by both the man and the woman” (p. 55). They noted that further study was needed to address this potential relationship.

Daniluk (1988) conducted a longitudinal study examining the impact of infertility on individuals and couples. She noted that, “research directed at examining the ‘impact’ of infertility on the couple and their relationship has been fraught with methodologic flaws and hampered by a lack of rigorous, scientific research procedures” (p. 982). In an attempt to address this need, she conducted a study using 63 infertile couples undergoing treatment at an infertility clinic. Each couple was administered data collection instruments at four time intervals: “immediately after the initial medical visit, four weeks later during medical testing, within one week of diagnosis, and at six weeks after diagnosis” (p. 983). The instruments included the SCL-90-R (measuring overall psychological distress), the Relationship Change Scale (RCS), the Marital Adjustment Test (MAT), the Index of Sexual Satisfaction (ISS), and an experimenter-generated questionnaire which gathered information about the individuals assessment of the medical interventions.

Study results were analyzed using MANOVA across the four testing intervals on each of the data collection measures. Sexual satisfaction did not vary across the four testing sessions.

Marital adjustment was also unaffected across the four testing sessions “on the basis of the participants, the receipt of specific diagnostic information, the identification of etiologic source, or the time couples spent trying to conceive before attending the clinic” (p. 986). In reporting these findings, Daniluk (1988) noted the shortcomings of the study, namely that without obtaining data on the levels of marital adjustment before their participation in the study, “it is impossible to determine whether the experience of infertility itself impacted positively or negatively on the marital relationship of the men and women involved” (p. 988). However, it could be concluded that the process of infertility treatments did not show any positive or negative changes in the couples’ marital relationship.

Benazon, Wright, and Sabourin (1992) conducted a longitudinal study examining the effects of infertility on marital functioning (e.g., stress, sexual satisfaction and marital adjustment). Noting the conflicting findings in relation to this topic, the authors attempted to determine if infertile couples in treatment experience, “deterioration in marital functioning over time” (p. 275). In total, 461 couples participated in the study. Each couple completed the Dyadic Adjustment Scale (DAS), the Index of Sexual Satisfaction (ISS), and the Psychological State of Stress (PSS). At the time of publication, not all of the longitudinal findings had been completed. However, the authors did present many of the initial findings. ANOVA were used to measure scores across gender, success of becoming pregnant over time, and three assessment periods. Over time, no significant changes were reported in levels of marital adjustment as measured by the DAS, “suggesting that marital satisfaction was unaffected by the treatment process” (p. 278). Correlational analyses established a clear relationship between marital satisfaction and other variables. As a result, regression analyses were performed. Results showed that for men, marital satisfaction was not determined by the variable of pregnancy nor

sexual satisfaction, but was solely accounted for by the level of stress they experienced as a result of the infertility. For women in the study, it was found that sexual satisfaction was the only variable that was predictive of marital satisfaction, suggesting that the quality of a women's sexual relationship is linked to the overall adjustment of her marriage. The authors concluded that although infertility was a stressful experience for both men and women and had effects on their sexual functioning, it did not positively or negatively affect their levels of marital satisfaction.

Levin, Sher, and Theodos (1997) conducted a study looking at the effects of stress and coping on marital distress in infertile patients. Employing a stress and coping theoretical framework, the authors studied 54 couples and 6 individuals whose partners did not complete the study. Participants completed the Coping Inventory for Stressful Situations—Situation Specific Coping (CISS-SSC), the Brief Symptom Inventory (BSI), and the Dyadic Adjustment Scale (DAS). Couples were recruited from infertility clinics and were sent a packet of study information if they agreed to participate.

Study findings were analyzed by dividing study respondents into groups based on their responses to the coping instruments. They found a significant interaction between coping styles and marital satisfaction. Women who utilized task-oriented coping styles reported the highest levels of marital satisfaction. Couples who both reported low levels of coping strategies, reported the lowest levels of marital satisfaction. The authors hypothesized that these findings may be related to “the effect of individual distress on the marital relationship” (p. 369), thus providing further support for the use of a family systems model when examining the influence of infertility on men and women.

Studies Examining the Couple as the Unit of Analysis.

When studying the psychological effects of infertility, only six studies since 1980 have examined the couple as the unit of analysis (Andrews, et al. 1991; Draye, et al. 1988; Hirsch & Hirsch, 1988; Sabatelli, et al. 1988; Stanton, et al. 1991; Ulbrich, et al. 1990). Considering that 94 quantitative and 26 qualitative articles have been published on the topic since that time, the number of studies examining couples as the unit of analysis is underrepresented. Greil (1997) has called for additional studies using the couples as the unit of analysis “because an individual’s response is likely to be dialectically related to the response of that individual’s partner . . . [and because] infertility is a shared reality of couples shaped both by medical variables and by a specific social context” (p. 1699).

Sabatelli, et al., (1988) studied the impact infertility has on couples and their marriages. Using a stress and coping theoretical framework advocated by McCubbin and Patterson (1982), they studied 29 couples recruited from the Connecticut chapter of Resolve (a national organization offering resources such as referrals, counseling, and support groups to infertile individuals and couples). The mean age of females in the study was 33.2 years. The mean age of male participants was 35.8. Of the female participants in the study, all had undergone treatment for infertility at some time, while only seven of the men had undergone treatment. The couples completed data collection instruments measuring the following variables: changes attributed to infertility, time spent coping with infertility, economic independence, marital satisfaction, marital commitment, locus of control, self-esteem, coping strategies, depression and anxiety, and adjustment to infertility.

The authors analyzed infertile couples as a dyadic unit. Paired t-tests were used to analyze husbands’ and wives’ adjustment and coping scores. They found that wives scored

significantly lower than their husbands on measures of adjustment to infertility and significantly higher on measures of anxiety. The authors also found a moderately high intercorrelation between husbands' and wives' adjustment to infertility. For example, husbands' adjustment to infertility was "significantly related to their wives anxiety and depression scores, while wives adjustment was only significantly related to their husbands' depression scores" (p. 341-342). Furthermore, husbands' and wives' self-esteem scores were correlated with the husbands adjustment to infertility, while husbands' and wives' marital commitment scores were correlated with the wives' adjustment to infertility. These findings led the authors to support the concept of family systems theory in relation to the effects of infertility on couples. They noted that "the results suggest that the overall adjustment to infertility is importantly influenced by not only one's own coping resources and coping strategies, but by the resources and coping strategies used by one's partner as well. . . . while the data highlight the impact of infertility on the individual and marital system, even more salient is how intertwined and reactive each system is to the other" (p. 342)

This study was not without its limitations. Specifically, the study was limited by its sample size and sampling strategy. Because study participants were obtained from a group of infertile persons pursuing some form of emotional support due to their infertility, the study does not examine those individual or couples who decided not to pursue such support. In addition, participants with male factor infertility are underrepresented. The authors note that this underrepresentation may be due to males "unwillingness to participate in research on sensitive issues and/or the possibility that males are less likely to seek support and education about the issue of infertility when it affects them or their spouse" (p. 342).

Draye, et al., (1988) examined how couples cope with infertility and examined the gender differences that exist in such coping. They viewed infertility from a developmental perspective, noting that infertility may induce a “developmental crisis” by blocking the social expectation of parenthood. They reviewed the literature on the socialization of men and women noting that women are taught to be mothers, and young couples often feel considerable pressure to become parents. They explored gender differences in infertile men and women in their personal and marital lives and examined how men and women differ in their approach to coping with infertility.

Study participants were patients at an infertility clinic in the northwestern United States between January and June of 1983. Measures included the Infertility Problem Inventory and a 20-item depression scale from the Center for Epidemiology Studies. The Infertility Problem Inventory identifies problems in five areas: personal life, marital relationship, relationship with family and friends, occupation, and the healthcare system. Patients were given questionnaires to complete at home. Both couples with primary and secondary infertility were included in the study. Twenty-six couples participated in the study. The sample was primarily white, aged in the late thirties, and had income greater than \$30,000 a year.

Women in the study showed greater overall distress than men. They reported lower self-esteem, higher levels of disruption in their personal lives, and higher although not statistically significant levels of depression, as 30% of women reported scores consistent with clinical rating of depression compared to 20% of men. There were no significant differences between men and women in the way they viewed problems related to their marriage, relationships with family and friends, or employment. It is important to note that this study included couples with both primary and secondary infertility. However, studies have shown that both types of infertility are

equally stressful (Domar, et al, 1992). One major limitation of this study is the authors failure to describe the methods used to study the couple as a unit of analysis.

Hirsch and Hirsch (1988) studied the effect of infertility on marriage and self concept. They studied 92 subjects divided into an experimental and control group. The experimental group contained 28 married couples seeking infertility treatment, while the control group contained 17 married couples who had not yet attempted to conceive, or were unconcerned with their ability to do so.

Couples in the study completed the Bem Sex-Role Inventory, Hudson Clinical Measurement Scales (designed to measure depression, self-esteem, marital discord, and sexual dissatisfaction), and an instrument designed to measure the level of investment the couple had made in the experience of infertility (e.g., length of time in infertility treatments, extent of medical interventions). A multifactor analysis of variance comparing the control and experimental groups was performed across all six dependent variables including femininity, masculinity, general contentment, self-esteem, marital satisfaction, and sexual satisfaction. Gender was used as an independent variable for both groups.

A unique finding to this study was that “infertile couples perceived themselves as more masculine than childless couples in the control group. Infertile couples also experienced significantly less sexual satisfaction than the couples in the control group” (p. 16). The authors noted that a select sub-group of couples did not agree on their answers to the question asking the couple to identify the primary reason they were unable to have children. These couples were included in a separate category of noncommunicators “based on the assumption that their lack of agreement on this crucial question was symptomatic of a greater problem: lack of communication” (p. 17). Findings from the study showed that couples in the noncommunicator

group showed “significantly higher levels of general discontent and of marital dissatisfaction” (p. 17). These findings were particularly relevant in light of Kraft’s findings (1980, as cited in Hirsch & Hirsch, 1988) that couples who expressed “ongoing mutuality” viewed infertility as a common problem regardless of who had the diagnosis. The authors hypothesize that couples who experienced ongoing mutuality were more likely to have greater empathy, discussion of their feelings, and a stronger marital bond. Couples not experiencing ongoing mutuality were more likely to experience discord regarding the infertility and, as a result, feel isolated and potentially grow further apart.

This study contained many of the limitations that are present in the majority of studies using infertile subjects – mainly the inclusion of professional, upper-middle class individuals who are pursuing infertility treatments at a private infertility clinic. The authors note that “infertility may have an even greater impact on single, low-income, ethnic individuals who cannot afford expensive medical interventions” (p. 19), and encouraged further research efforts to address this understudied population.

Andrews, et al., (1991) studied the effects of stress from infertility on life quality and marriage factors. They noted that little empirical research had been conducted on this issue and that the majority of conclusions made concerning the effects of infertility on marital factors and life quality were anecdotal. The study examined “subjective well being” as their outcome variable and examined how the stress related to infertility directly and indirectly impacted their well being, including measures of self, marriage, intimacy, and personal health.

In 1988, men and women in 157 infertile couples were separately interviewed by the staff of the Michigan’s Survey Research Center. Participants were recruited from infertility clinics, support groups, newspaper advertisements, and referrals from other study participants. All

members of the study were white, middle-class, and did not have any children within their marriage or from previous marriages. Infertile couples who had attempted *In Vitro Fertilization* were not included in the sample as the researchers sought to include couples who were in the early stages of infertility. The study examined six major areas: stress linked to the fertility problem, marital conflict, sexual self-esteem, sexual dissatisfaction, frequency of sexual intercourse, and subjective well-being. Age and length of marriage were also used as additional variables.

Wives consistently reported higher levels of fertility problem stress than their husbands. However, there were no differences between wives and husbands in their assessment of their life quality. When examining bivariate relationships, greater stress was related to greater marital conflict and sexual dissatisfaction and with lower sexual self-esteem and life quality. The study also found a positive relationship between fertility problem stress reported by the wife and fertility problem stress reported by the husband, but showed that members of the same couple may experience different levels of fertility problem stress. This finding is particularly important to the proposed study as it shows that differences exist in couples with regard to fertility perceived stress, however, the ramifications of how these differences affect the couple relationship remain unexplored.

Results also showed that the total effects of fertility problem stress were “consistently negative” in the lives of men and women with regard to life quality. They also empirically showed that fertility problem stress had a greater impact on the lives of wives than it did their husbands, thus confirming the anecdotal literature that consistently states this claim. Furthermore, the results from this study “provide quantitative documentation of the wide-ranging and substantial deleterious effects that fertility problem stress may have on the marriages and life

quality of couples trying to cope with infertility. This is in contrast to some of the anecdotal evidence that fertility problems may bring couples closer together and thereby enhance life quality” (p. 248).

Ulbrich, et al. (1990) studied the effect of infertility on marital adjustment. They attempted to examine the similarities between infertile spouses’ perception of their marital adjustment. The study used a non-probability sample of 127 married couples undergoing infertility treatments obtained through referrals from physicians specializing in infertility treatments and through the local branches of Resolve. Questionnaires included the Dyadic Adjustment Scale (DAS), an instrument measuring infertility duration and diagnosis, and an instrument measuring the couple’s stress associated with the infertility, specifically examining self-blame, guilt, self-esteem, and sexuality. Questionnaires were sent to participants through the mail with consent forms, letters of explanation, and stamped return envelopes. The response rate was estimated at 84% for the couples referred through Resolve, but was undetermined from the couples referred by their physicians. This study was based on a sample of 103 couples who returned the completed questionnaires.

Couples had been married an average of seven years and had been in some type of infertility treatment for approximately three years. Male infertility was underrepresented in the study as only 11% of the cases were primarily a male-factor diagnosis. Sixty-eight percent of the participant were given a female diagnosis, and approximately 20% was a combination of both. The authors speculated that this may be a function that men are more reluctant to discuss their infertility through questionnaires and also may be less likely to seek social support.

To examine the similarities between husbands and wives’ reports on the subjective variables, paired t-tests were conducted. Significant differences were found between spouses’

attitudes towards childlessness. Wives viewed the situation as less acceptable than their husbands and also reported significantly greater stress associated with the overall experience of infertility than their husbands. They did not, however, differ significantly on three out of four of the sub-scales of the DAS with the exception being cohesion as husbands viewed their relationships as more cohesive than their wives.

The authors also used stepwise multiple regression to “determine the predictors of spouses’ perceptions of marital adjustment” (p. 153). Husbands’ attitudes towards childlessness was positively related to every measure and was the strongest predictor of marital adjustment. Greater stress was associated with husbands’ reports of less satisfaction, less consensus, and less affectionate expression. Wives’ infertility related stress was related to satisfaction, consensus, and affection. There was also greater stress when women perceived less satisfaction, less consensus, and less affectionate expression.

These findings are particularly relevant to the current study. Ulbrich et al. note that “spouses differ in the level of stress associated with their infertility, with wives experiencing more stress than their husbands” (p. 155). From this result, we hypothesized that females in the current study likely experience a greater amount of stress than their husbands. However, the current study expanded these findings by comparing couples who differ in their levels of stress related to infertility with couples who experience similar levels of stress. Thus, the study was not limited to comparing husbands and wives, but also compared couples who experience differences in their levels of stress related to infertility.

Stanton, et al., (1991) examined how the cognitive appraisals of infertile couples relate to each other, and how these appraisals were related to their overall adjustment. Using a theoretical framework of stress and coping focusing on the influence of cognitive processes in relation to its

impact on the stress associated with infertility, the authors hypothesized that psychological distress would be greater when infertility was appraised as threatening, having little positive benefit, and being highly uncontrollable. The study employed samples from two geographical regions, the Southeast and Northeast. The sample from the Southeastern region included 34 married couples and seven females whose husbands chose not to participate. The sample from the Northeastern region included 20 married couples and 15 females whose husbands would not participate, for a total of 76 females and 54 males in the entire sample.

Participants from the two regions were recruited using different means. Individuals from the Southeast were referred from gynecological physicians in a university community. Participants from the Northeast were recruited from a university infertility clinic, newspaper advertisements, and the local chapters of Resolve. Participants were administered instruments measuring cognitive appraisals of threats, challenge, and personal control. Threats were defined as “the extent to which infertility had potential to harm such areas as self-esteem, important life goals, financial security and health” (p. 5). Challenge appraisals on the other hand, related to the degree that infertility provided a platform for personal growth, a personal challenge, or the possibility of strengthening the couple relationship. They were also given an instrument measuring global distress and infertility specific distress.

In agreement with the authors initial hypothesis, infertile couples felt both threatened and challenged by their infertility. The notion that the infertile couples and individuals often feel less control over their infertility was supported by this study. Findings from this study were unique in that the “responses of husbands and wives were paired and correlated” (p. 6). The couple was studied as the unit of analysis in an attempt to examine if married partners differed in their appraisals of psychological distress, to assess if the appraisals of one member of the couple was

associated with the others, and to explore if the relationship between cognitive appraisals and adjustment was similar for men and women.

The authors noted that “few statistically significant pooled correlations emerged between partners’ scores on identical measures or between one partner’s cognitive appraisal and the other partner’s adaptational status. There were correlations between husbands’ and wives’ challenge appraisals showing that wives’ who felt challenged by their infertility, also had husbands’ who felt similarly. Challenge was also a positive factor for husbands whose wives showed greater challenge as men whose wives reported more challenge in relation to their infertility experienced less global stress. With relation to other gender differences, wives reported greater negative reactions between control and global distress than did their husbands.

The findings from this study support the hypothesis that a stress and coping theoretical framework is a viable approach to use when studying infertility. The study also lends support to the link between infertility and family systems theory. The authors note that “husbands reported less distress as their wives perceived greater challenge from their infertility (finding positive aspects in their infertility)” (p. 12). The current study attempted to build on the findings from this study by examining the cognitive appraisals of infertile couples to see how differences between spouses’ appraisals influence their individual reports of depression and marital adjustment.

CHAPTER III

METHODS

Design of the Study

This study analyzed data previously collected through the Reproductive Endocrinology and Infertility Clinic, at the London Health Science Centre in Ontario Canada. Colby (1982) noted that secondary analysis “provides an economical way to conduct exploratory research, allowing one to delimit the problem, to refine the questions to be addressed and the means for addressing those questions” (p. 122). She also noted that secondary analysis “allows one to examine evidence based on data collected using several designs, cohorts, or types of samples” (p. 122). This study effectively utilized secondary data analysis techniques to examine the relationships between couple’s perceptions of their infertility perceived stress and its impact on depression and marital adjustment in infertile men and women.

Study Participants and Procedures

Study participants were comprised of men and women referred to a university-affiliated teaching hospital for assessment and treatment with In Vitro Fertilization, Intrauterine Insemination or Therapeutic Donor Insemination between the years of 1998 and 2000 (Newton, et al, 1999). Couples who were eligible to receive treatment were required to have stable marital relationships, less than two children living at home, and a referral from their gynecologist or infertility specialist, “typically after several years of unsuccessful treatments to overcome their infertility” (Newton, 1990). Three months prior to treatment, prospective participants were mailed a series of self-report measures. Both husbands and wives were asked to complete the instruments separately and return them by mail before making a pretreatment appointment with the program staff (Newton, et al, 1999). Once the instruments had been received by the clinic,

the data were cleaned and entered into a database containing the final responses of both members of the couple. For the purposes of this study, only couples experiencing primary infertility in their current relationship were included in the sample. In addition, only couples who provided information on all of the three data collection measures presented later in this chapter were included in the final sample.

A total of 1,050 individuals representing 525 couples were included in the study. Males were slightly older than females with a mean age (\pm SD) of 33.8 ± 5.3 , compared to 32.3 ± 4.3 for females ($t = -7.8, p < .001$). More than half of the men and women received some type of post secondary education (58% of women, 54% of men). Seventy-one percent of infertility diagnoses were directly attributable to female participants (e.g., tubal factors, endometriosis), 17% was idiopathic or unexplained infertility, and 11% was diagnosed as male factor infertility. The mean duration of infertility for study participants was 3.5 ± 2.8 years.

Data Collection Instruments

Study participants initially obtaining treatment at the infertility clinic were asked to complete the following instruments: The Fertility Problem Inventory (FPI), the Beck Depression Inventory (BDI), The State-Trait Anxiety Inventory, the Dyadic Adjustment Scale (DAS), and the Social Desirability Scale of the Personality Research Form-E. For the purposes of this study, only couples who completed the FPI, BDI, and DAS were included in the final sample.

Fertility Problem Inventory (FPI)

The Fertility Problem Inventory (FPI, attachment 1) is a 46-item questionnaire developed by Christopher Newton of the London Health Sciences Center in Ontario, Canada. It was used to measure the level of a couple's infertility-related stress. Since much of the psychological research on infertility has been limited by a lack of infertility specific measures, the FPI was

developed to provide a reliable and valid instrument to address this critical need (Newton, et al. 1999). A preliminary questionnaire was developed after conducting an extensive review of the infertility literature, which examined the attitudes and beliefs of infertile patients (Newton, 1999). From this search, infertility-related themes were identified resulting in seven relevant domains or themes including: social concern, sexual concern, relationship concern, role loss, role failure, need for parenthood, and rejection of childfree lifestyle. Respondents were asked to indicate their agreement with each question using a six-point Likert scale ranging from “strongly disagree” to “strongly agree” (Newton, 1999). The result was an 84-item questionnaire which addressed seven infertility-related themes.

The FPI was finalized after an extensive test-development period. During development, the FPI employed a “sequential strategy of scale construction” (p. 55). Items which 95% of males or females reported as a 1, 2, 5, or 6 were considered to “discriminate inadequately among respondents and were discarded” (p. 55). Convergent and discriminant validity were enhanced by eliminating items that correlated more highly with any scale other than the scale for which they were intended. Items that generated socially desirable responses were also eliminated. The final questionnaire consisted of 5 scales: social concern, sexual concern, relationship concern, need for parenthood, and rejection of childfree lifestyle. Newton (1999) noted that because “role loss and role failure showed unacceptably high correlations both with social concern (.81 and .72 respectively) and with each other (.77)” both scales were discarded.

Each of the five scales consisted of relatively homogenous items as indicated by the moderate to high reliability (internal consistency) of each scale (social concern = 0.87, sexual concern = 0.77, relationship concern = 0.82, rejection of childfree lifestyle = .80, need for parenthood = 0.84, and global stress = 0.93). Test-retest correlations performed after a 30 day

interval also showed moderate to high reliability (global stress was 0.83 for women and 0.84 for men).

Discriminant validity, or the extent to which the sub-scales measure separate items, was obtained by measuring the intercorrelations between the five scales. Newton (1999) noted that “intercorrelations were significant but low to moderate in size (mean intercorrelations, 0.45; range 0.26-0.66) and provided evidence that the questionnaire was indeed measuring separate, although related, dimensions of infertility related stress” (p. 56). Convergent validity was determined by assessing correlations between the FPI and the other collateral measures used in the study (i.e., the BDI, and the DAS). The observed correlations were “in the expected direction and moderate in size” (p. 56).

Dyadic Adjustment Scale (DAS)

The DAS (attachment 2) is a 32-item scale developed by Spanier (1976) that measures the overall adjustment couples experience within their relationship. The instrument was developed to create a reliable and valid measure regarding marital adjustment since it was one of the most commonly studied dependant variables in the field of marriage and family relationships. The DAS contains four sub-scales: dyadic satisfaction, dyadic cohesion, dyadic consensus, and affectional expression. The satisfaction sub-scale includes 10 items and has scores ranging from 0 to 50. It is intended to assess the degree to which “the couple is satisfied with the present state of the relationship and is committed to its continuance” (Ulbrich, et al., 1990). The cohesion sub-scale includes five items with scores ranging from 0 to 24, and measures the degree to which the couple engages in activities together. Consensus contains 13 items with scores ranging from 0 to 65. It measures the degree to which couples agree on matters of importance in their relationship. Affectional expression includes 4 items with scores ranging from 0 to 12, and

measures the degree to which the couple is satisfied with the expressions of affection and sex in the relationship. Spanier reported that the measure demonstrated content validity, criterion-related validity, and construct validity. Internal consistency reliability for each of the sub-scales was reported at: satisfaction .80 females, .82 males; cohesion .75 women, .78 men; consensus .77 women, .85 men; and affectional expression .64 women, .63 men.

Beck Depression Inventory (BDI)

The BDI (attachment 3; Beck, Rush, Shaw, and Emery, 1979) was used to assess the severity of depression among infertile study participants. The Beck is a 21-item survey and has been “substantiated through a large body of research” (Newton, et al., 1999). The BDI “reliably measures the severity of depressive symptoms in non-psychiatric samples, correlates highly with clinical rating of depression, and differentiates depression from anxiety” (Fincham, Beach, Harold, and Osborne, 1997). Each question contains four response options ranging from zero to three, with the higher rating indicating a more severe symptom of depression. The total range of potential total scores vary from 0 to 52. Scores between zero and nine indicate that depression is not present, scores between 10-18 indicate mild/moderate depression, scores ranging from 18-29 indicate moderate to severe levels of depression, and scores of 30 and above indicate extremely severe levels of depression. In accordance with the testing guidelines, a score of 10 or greater was used to indicate the presence of depression symptoms

Data Cleaning and Analysis

An SPSS database containing 7,405 records was obtained from Dr. Christopher Newton of the London Health Sciences Centre Department of Reproductive Endocrinology and Infertility in Ontario, Canada. The data had been collected over a period of several years from men and women seeking advanced infertility treatments at the aforementioned infertility clinic. Three

months prior to treatment, participants were required to complete several data collection instruments including the State Trait Anxiety Inventory, the Beck Depression Inventory (BDI), the Dyadic Adjustment Scale (DAS), the Social Desirability Scale of Personality Research Form-E, and the Fertility Problem Inventory (FPI). Couples were coded on the basis of a patient number. Females were assigned an even patient number and their male partners were given the odd number immediately preceding the number (e.g., female partner =110, male partner = 109).

For the purposes of this study, only data from the BDI, DAS, and FPI were analyzed, and only couples who had completed all three data collection instruments were included in the study. Individuals in the data set whose partner did not complete the instruments were excluded from the study. Following the elimination of these individuals and couples, a total of 1,338 records remained. Of these, only those who experienced primary infertility in their current relationship were included in the study, leaving a final sample of 1,050 individuals or 525 couples.

In order to examine differences in couples with relation to their levels of infertility-related stress, it was necessary to examine the male and female data as a single unit. This entailed merging the two separate rows of data for both partners into one combined row of data. In order to accomplish this, male and female subjects were assigned to two separate groups and were coded with a couple number that appropriately linked male and female partners. New variable names were created in each of the two files, and the files were combined into a couple's file that contained one row of data per couple.

Once the couple file was created, difference scores on each of the sub-scales of the FPI were obtained by subtracting the female partner's score on the sub-scale from the male partner's score. The difference between the couple's scores constituted the final difference score. After difference scores were obtained, couples were divided into groups based on their differences in

order to assess the effects of overall congruence. Three groups of couples were created – couples in which the male experienced a greater amount of stress than the female, couples in which both males and females perceived the infertility as equally stressful, and couples in which the female perceived the stress related to the infertility as more stressful than the male. Each group was given a variable of -1 , 0 , or 1 , respectively, for grouping. This design allowed for the study of congruence as couples experiencing equal levels of infertility-related stress were considered more highly congruent than those whose stress levels were not equal.

Means and standard deviations of men and women with regards to depression and marital adjustment were examined. Correlation and regression analysis examining the predictive nature of differences in infertility-related stress on depression and marital adjustment were also studied. Analyses of variance were used to compare means of depression and marital adjustment scores among the three groups of couples based on differences in their levels of perceived stress as reported by both members of the couple.

Unit of Analysis

This study examined couples as the primary unit of analysis as determined by the differences they report with their partner on measures on infertility-related stress. As stated earlier, Greil (1997) noted the importance of studying infertility using the couple as the unit of analysis “because an individual’s response is likely to be dialectically related to the response of that individual’s partner” (p.1699).

Copeland and White (1991) discussed the different types of analysis one can make when examining family related issues. They note that data can be collected and analyzed at an individual, dyadic, or family systems level, and that measures that collect data at the individual level can be coded to form a dyadic variable. This variable is created on the basis of two

individual reports “forming a dyadic variable from individual assessments” (p. 24). This type of analysis is critical to this study. Because the FPI is designed to measure individual levels of perceived infertility-related stress, a conversion of the individual scores to a dyadic measure enabled the study to examine the effect of infertility-related stress on men and women within couples’ who had differing amounts of stress as opposed to focusing solely on individual men and women. A conversion to a dyadic variable was not attempted however, with regards to husband’s and wife’s individual reports of depression and marital satisfaction. It was felt that an average depression score for the couple would not provide a meaningful or appropriate measure as it is specifically designed to assess an individual report of an individual problem. The same rationale was used for marital satisfaction even though it is constructed as an individual report of a dyadic situation and could conceivably be converted given the proper study conditions. Therefore, this study analyzed the impact of the dyadic variable (couple differences on infertility-related stress) on individual variables of depression and marital adjustment in infertile men and women.

CHAPTER IV

RESULTS

Introduction

This study explored the effect of congruence between couples with regard to infertility-perceived stress and its effect on individual levels of depression and marital adjustment in infertile men and women. The data used for the study were obtained from The Reproductive Endocrinology and Infertility Clinic at the London Health Science Centre in Ontario Canada. A total of 1,050 individuals representing 525 couples were included in the study. These couples had been referred to the university-affiliated teaching hospital for assessment and advanced infertility treatments. Couples in the sample were required to complete the Fertility Problem Inventory (FPI), the Beck Depression Inventory (BDI), and Dyadic Adjustment Scale (DAS), which were used as the measures of assessment in the study.

Profile of the Sample

Table 1 presents the means and standard deviations of men and women with regards to depression, marital adjustment, and infertility-related stress. Females perceived infertility as more stressful than males on each of the 5 sub-scales of the FPI, confirming previous research that shows that females experience greater amounts of infertility-related stress when compared to males. Overall, females reported a mean global stress score of 132.1 compared to 116.1 in males ($t = 12.4, p < .01$).

Although, females had higher mean scores of depression (5.8) than males (3.4), ($t = 9.2, p < .01$), both means fell in the “non-depressed” range of the BDI. It should also be noted that frequency distributions of male and female depression scores revealed that the majority of men and women in the study did not score in depressed range as measured by the BDI. The Beck

Table 1

Means, Standard Deviations, and t-Tests for Male and Female Depression, Marital Adjustment, and Perceived Infertility-Related Stress (n=1,050)

Variable	Males (n=525)		Females (n=525)		t-Value
	Mean	SD	Mean	SD	
<u>Beck Depression Scale</u>					
Beck Total Score	3.4	4.5	5.7	5.9	9.2**
<u>Dyadic Adjustment Scale</u>					
DAS Consensus	50.8	5.9	50.8	6.1	-1.4
DAS Satisfaction	41.1	4.2	41.0	4.3	-.78
DAS Affect. Expression	9.4	1.9	9.3	1.9	-.46
DAS Cohesion	16.7	3.4	16.8	3.3	.62
DAS Total	118.0	11.9	117.9	12.25	-.14
<u>Fertility-Problem Inventory</u>					
Sexual Concern	14.3	5.5	17.8	7.8	10.6**
Social Concern	22.8	9.6	27.9	11.1	11.8**
Relationship Concern	19.3	7.8	20.9	8.7	5.0**
Rej. Childfree Lifestyle	25.8	7.7	26.6	7.9	2.3*
Need for Parenthood	33.9	10.3	38.9	10.2	11.2**
Global Stress	116.2	30.3	132.1	34.4	12.4**

** p < .01

* p < .05

depression scale scores range from 0 to 52. Scores between zero and nine indicate that depression is not present, 10-18 indicate mild/moderate depression, 19-29 indicate moderate to severe levels of depression, and scores of 30 and above indicate extremely severe levels of depression (Beck, et al. 1979). Individual scores ranged from 0 to 37 in females and 0 to 32 in males. However, only 18% of female and 8% of male respondents reported depression scores of 10 or greater, indicating a generally non-depressed sample of men and women.

Results for marital adjustment, as measured by the Dyadic Adjustment Scale, indicated well-adjusted couples with no differences between males and females ($t = .14, p = .89$). Mean overall scores of 100 or greater typically indicate well-adjusted couples (Spanier, 1976). Frequency distributions revealed that 94% of males and 93% of females had scores of 100 or higher. Males and females in the study reported similar levels of adjustment with mean score of 117.9 for females and 118.0 respectively; (range: 73 to 145 for females, 58 to 145 for males).

Relationships Between Couple Differences, Depression, and Marital Adjustment

In order to explore the relationship between couple difference scores on measures of infertility-perceived stress and measures of depression and marital adjustment in infertile men and women, correlational analyses were performed. The correlations were computed separately for males and females and are presented in Table 2.

Female depression scores were significantly correlated with couple difference scores on all six scales of the FPI indicating a positive relationship between the variables. The strongest correlations existed between couple differences and female depression with regards to sexual concern ($r=.39$), global stress ($r=.35$), social concern ($r=.34$), and relationship concern ($r=.25$). Male depression did not correlate with any of the sub-scales of the FPI.

Couple differences on four of the six sub-scales of the FPI significantly correlated with female total marital adjustment. Differences in sexual concern presented the strongest correlation ($r= -.21$), followed by weaker, yet significant correlations in global stress ($r= -.18$), relationship concern ($r= -.17$), and social concern ($r= -.14$). For males, differences in sexual concern presented a relatively weak, yet significant correlations with male total marital adjustment ($r= -.12$) and rejection of childfree lifestyle ($r= -.11$).

Table 3 shows the intercorrelations of depression and marital adjustment. For both males and females, depression and marital adjustment were moderately correlated ($r= -.36$ and $r= -.40$, respectively), indicating a tendency for an inverse relationship between the two variables. Within couples, husband's and wife's scores were positively related to a moderate degree for depression ($r=.38$), but to a strong degree for marital adjustment ($r=.69$).

Table 2

Correlations of Couple Differences on Measures of Infertility-Perceived Stress with Depression and Marital Adjustment in Infertile Men and Women (N=1,050)

Couple Differences on FPI	Female Depression	Male Depression	Female Dyadic Adjustment Total	Male Dyadic Adjustment Total
Social Concern	.34**	-.06	-.14**	-.05
Sexual Concern	.39**	-.02	-.21**	-.12**
Relationship Concern	.25**	-.08	-.17**	.05
Rejection of Childfree Lifestyle	.15**	.07	-.07	-.11*
Need for Parenthood	.10*	-.04	-.08	-.06
Global Stress	.35**	-.04	-.18**	.08

** Correlation is significant at the .01 level (two-tailed)

* Correlation is significant at the .05 level (two-tailed)

Table 3

Intercorrelations Between Depression and Marital Adjustment (n=1,050)

Variable	Male Depression	Male Marital Adjustment	Female Depression	Female Marital Adjustment
Male Depression	--			
Male Marital Adjustment	-.36**	--		
Female Depression	.38**	-.27**	--	
Female Marital Adjustment	-.26**	-.69**	.40**	--

** Correlation is significant at the .01 level (two-tailed)

Examining the Ability of Couple Differences to Predict Depression and Marital Adjustment

Regression analyses were performed in order to determine the best predictors of depression and marital satisfaction among couples experiencing differences in infertility-related stress. Multiple regression analyses were conducted using depression and marital adjustment as dependent variables and differences in couples' reports of perceived-infertility related stress on each of the five sub-scales of the FPI as independent variables.

Results from the regression analyses for male and female depression are presented in Tables 4 and 5. Differences between couples regarding infertility-related stress were predictive of female depression ($R^2 = .20$, $F = 26.5$, $p < .001$), accounting for 20% of the variance in female depression scores in the sample (see Table 5). According to this model, sexual concern and social concern accounted for the greatest amount of variance. With regards to male depression, difference scores between couples along the sub-scales of the FPI accounted for only 2% of the variance in male depression scores ($R^2 = .02$, $F = 2.2$, $p = .052$) (see Table 6).

Regression analyses were also performed using marital adjustment as the dependent variable (Tables 6 and 7). Differences between couples on infertility-related stress accounted for only 5% of the variance in total female marital adjustment in the sample ($R^2 = .05$, $F = 5.5$, $p = .000$) (Table 6). According to the model, sexual concern was the only variable that significantly accounted for the variance in female marital adjustment. For male marital satisfaction, couple differences on the sub-scales of the FPI explained 3% of the variance in total marital adjustment ($R^2 = .03$, $F = 3.7$, $p = .003$) (Table 7).

Table 4
Multiple Regression Analysis: Assessing the Relationship Between Female Depression and Differences Between Couples on Measures of Perceived Infertility-Related Stress

Variable	B	SE B	β	p value
Social Concern	.13	.28	.22**	< .001
Sexual Concern	.24	.04	.30**	< .001
Relationship Concern	.04	.04	.05	.248
Reject Childfree Lifestyle	.08	.03	.10*	.026
Need for Parenthood	-.09	.03	-.16*	.001

Note. $R^2 = .20$, $p < .001$

** $p < .01$

* $p < .05$

Table 5
Multiple Regression Analysis: Assessing the Relationship Between Male Depression and Differences Between Couples on Measures of Perceived Infertility-Related Stress

Variable	B	SE B	β	p value
Social Concern	-.02	.02	-.05	.324
Sexual Concern	.02	.03	.04	.457
Relationship Concern	-.05	.03	.08	.113
Reject Childfree Lifestyle	.07	.03	.12*	.013
Need for Parenthood	-.03	.02	-.08	.132

Note. $R^2 = .02$, $p = .05$

** $p < .01$

* $p < .05$

Table 6

Multiple Regression Analysis: Assessing the Relationship Between Female Marital Adjustment and Differences Between Couples on Measures of Perceived Infertility-Related Stress

Variable	B	SE B	β	p value
Social Concern	-.05	.07	-.04	.411
Sexual Concern	-2.4	.09	-.15**	.006
Relationship Concern	-.14	.08	-.08	.091
Reject Childfree Lifestyle	-.05	.08	-.032	.591
Need for Parenthood	.03	.06	.02	.654

Note. $R^2 = .05$, $p < .001$

** $p < .01$

* $p < .05$

Table 7

Multiple Regression Analysis: Assessing the Relationship Between Male Marital Adjustment and Differences Between Couples on Measures of Perceived Infertility-Related Stress

Variable	B	SE B	β	p value
Social Concern	.09	.06	.01	.889
Sexual Concern	-.26	.09	-.17**	.002
Relationship Concern	.21	.08	.13**	.010
Reject Childfree Lifestyle	-.15	.08	-.10*	.044
Need for Parenthood	.03	.06	.02	.648

Note. $R^2 = .03$, $p = .003$

** $p < .01$

* $p < .05$

Congruence Between Couples and its Relationship to Depression and Marital Adjustment

In order to explore if different patterns of infertility-related stress were related to differences in the partner's responses, couples were placed into one of three groups: couples in which the man's infertility-perceived stress was greater than the woman's; couples in which each partners level of stress was equal; and couples in which the woman's infertility perceived stress was greater than the man's.

Since previous research has shown that higher levels of agreement on stressful life events have caused lower levels of negative symptoms in couples and families (Patterson, 1993 as cited in Snell & Rosen, 1997), a tentative hypothesis was made that the group reporting equal levels of stress would report lower mean depression scores and higher marital adjustment scores when compared to the other two groups. One-way analyses of variance were conducted to test this hypothesis by comparing the mean scores of depression and marital adjustment in each group. Post-hoc comparisons were conducted to determine which groups, if any, showed significant differences.

The results of the ANOVAS and characteristics of the groupings across each of the subscales of the FPI are presented in Tables 8 and 9. Women in infertile couples whose infertility-related stress levels were equal reported significantly lower depression scores on the BDI than couples where the woman's stress was greater than the man's on the scales of sexual concern ($F = 17.9, p < .001$), relationship concern ($F = 12.2, p < .001$) (see also Figure 1) and social concern ($F = 11.1, p < .001$). Men in couples whose infertility-related stress levels were equal reported significantly lower scores of depression when compared to men in the other two groups with regards to sexual concern ($F = 3.9, p < .05$). Men in couples whose stress levels were equal also reported lower mean levels of depression when compared to men in couples who reported greater

Table 8

One-way Analysis of Variance: Examining Mean Differences of Depression and Marital Adjustment in Couples Experiencing Infertility-Related Stress as Measured by the FPI

Variable	Male Stress > Female Stress	Male Stress = Female Stress	Female Stress > Male Stress	<i>F</i>	<i>p</i> value
	Mean (n=)	Mean (n=)	Mean (n=)		
<u>Sexual Concern</u>	(n=141)	(n=62)	(n=322)		
Female Depression	3.9	3.6	6.9+	17.9**	<.001
Male Depression	3.8+	1.9	3.5+	3.9*	.020
Female Marital Adjust.	119.2	122.7	116.4+	8.3**	<.001
Male Marital Adjust.	117.6+	123.0	117.2+	6.5**	.002
<u>Social Concern</u>	(n=146)	(n=27)	(n=352)		
Female Depression	4.3	3.1	6.6+	11.1**	<.001
Male Depression	4.0	1.9	3.2	3.1*	.046
Female Marital Adjust.	118.7+	126.3	116.9+	7.9**	<.001
Male Marital Adjust.	117.3+	125.3	117.7+	5.6**	.004
<u>Relationship Concern</u>	(n=189)	(n=56)	(n=280)		
Female Depression	5.0	3.1	6.8+	12.2**	<.001
Male Depression	4.0+	2.0	3.2	4.6*	.011
Female Marital Adjust.	118.1+	123.7	116.5+	8.8**	<.001
Male Marital Adjust.	115.3+	124.1	118.5+	12.9**	<.001
<u>Reject Childfree Lifest</u>	(n=208)	(n=44)	(n=273)		
Female Depression	4.7	5.0	6.7	7.4**	.001
Male Depression	3.1	3.4	3.6	.82	.437
Female Marital Adjust.	119.0	119.9	116.7	2.6	.071
Male Marital Adjust.	119.2	119.9	116.7	3.3*	.039
<u>Need for Parenthood</u>	(n=142)	(n=29)	(n=354)		
Female Depression	5.6	5.0	5.9	.39	.676
Male Depression	3.5	4.7	3.2	1.5	.236
Female Marital Adjust.	116.8	120.5	118.1	1.3	.272
Male Marital Adjust.	117.3	119.1	118.1	.35	.702

** $p < .01$

* $p < .05$

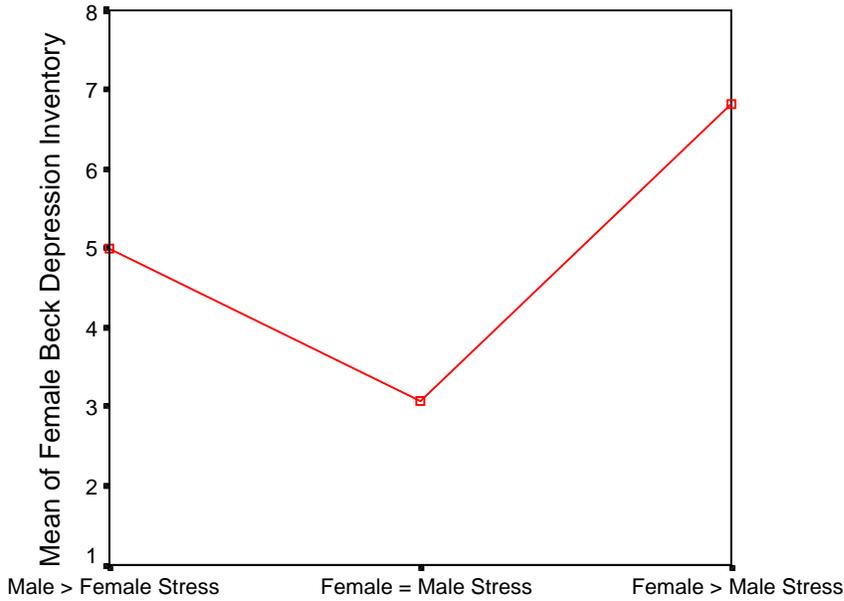
+ Post-hoc tests revealed significant differences between couples in male stress = female stress group and group(s) indicated

Table 9

Profile of Group Characteristics: Average Levels of Stress and Severity of Depression

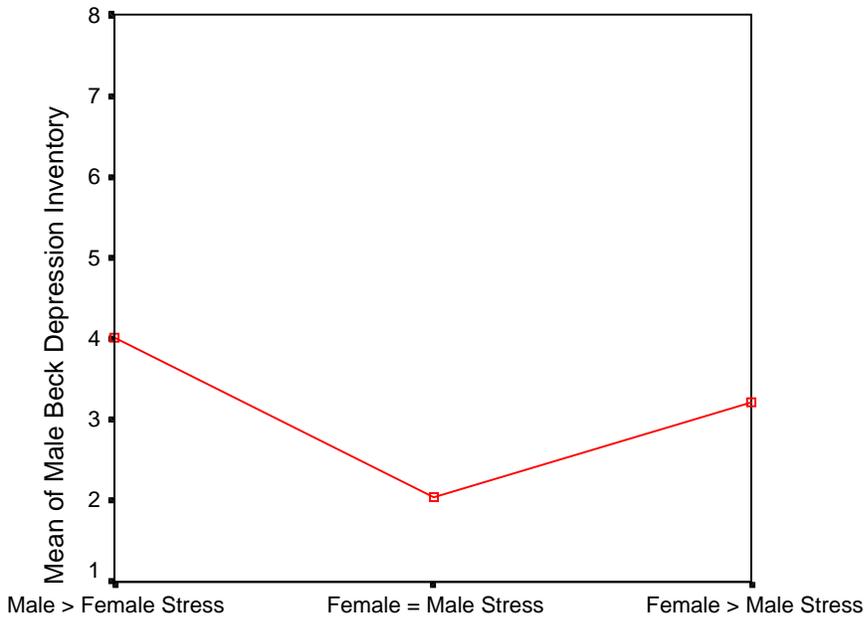
Variable	Male Stress > Female Stress	Male Stress = Female Stress	Female Stress > Male Stress
<u>Sexual Concern</u>	<u>(n=141)</u>	<u>(n=62)</u>	<u>(n=322)</u>
Range of Difference	1-19	0	1-30
Female Mean Sexual Stress	13.2	11.6	20.9
Male Mean Sexual Stress	17.7	11.6	13.4
Female Mean Global Stress	117.7	110.3	142.6
Male Mean Global Stress	121.8	101.0	116.6
Percent Females \geq 10BDI	7%	11%	27%
Percent Males \geq 10BDI	10%	3%	9%
<u>Social Concern</u>	<u>(n=146)</u>	<u>(n=27)</u>	<u>(n=352)</u>
Range of Difference	1-31	0	1-38
Female Mean Social Stress	21.6	19.9	31.1
Male Mean Social Stress	27.8	19.9	21.0
Female Mean Global Stress	119.1	116.5	138.7
Male Mean Global Stress	127.7	107.0	112.1
Percent Females \geq 10BDI	11%	7%	22%
Percent Males \geq 10BDI	10%	7%	7%
<u>Relationship Concern</u>	<u>(n=189)</u>	<u>(n=56)</u>	<u>(n=280)</u>
Range of Difference	1-27	0	1-31
Female Mean Relation. Stress	17.9	15.1	24.1
Male Mean Relation. Stress	23.1	15.1	17.6
Female Mean Global Stress	128.6	115.3	137.8
Male Mean Global Stress	125.6	108.9	111.3
Percent Females \geq 10BDI	16%	8%	26%
Percent Males \geq 10BDI	12%	4%	8%
<u>Reject Childfree Lifest</u>	<u>(n=208)</u>	<u>(n=44)</u>	<u>(n=273)</u>
Range of Difference	1-28	0	1-25
Female Mean Rej. Chd Stress	22.9	26.6	29.3
Male Mean Rej. Child Stress	29.3	26.6	23.0
Female Mean Global Stress	122.2	135.7	139.0
Male Mean Global Stress	121.7	122.3	110.9
Percent Females \geq 10BDI	16%	18%	25%
Percent Males \geq 10BDI	7%	12%	10%
<u>Need for Parenthood</u>	<u>(n=142)</u>	<u>(n=29)</u>	<u>(n=354)</u>
Range of Difference	1-43	0	1-33
Female Mean Need Par. Stress	33.1	40.4	41.5
Male Mean Need Par. Stress	40.2	40.4	30.9
Female Mean Global Stress	119.0	139.9	136.7
Male Mean Global Stress	127.0	135.9	110.2
Percent Females \geq 10BDI	21%	17%	21%
Percent Males \geq 10BDI	9%	14%	9%

Figure 1: Profile of Mean Differences of Female and Male Depression in Couples Experiencing Perceived Infertility Stress Related to Relationship Concern



Couple Differences: Relationship Concern -- 3 Groups

$F = 12.2$ $p < .01$. * Post-hoc test revealed significant differences between f=m and f>m group



Couple Differences: Relationship Concern -- 3 Groups

$F = 4.6$ $p < .05$. * Post-hoc test revealed significant differences between f=m and m>f group

amounts of infertility-related stress than their partners on the scales of relationship concern ($F = 4.6, p < .05$) (see Figure 1). These findings seem to suggest that when couples agree on their appraisal of infertility-perceived stress with regards to sexual concern, social concern, and relationship concern, men and women report lower scores of depression when compared to men and women in couples who report differences in their appraisal of the infertility-related stress.

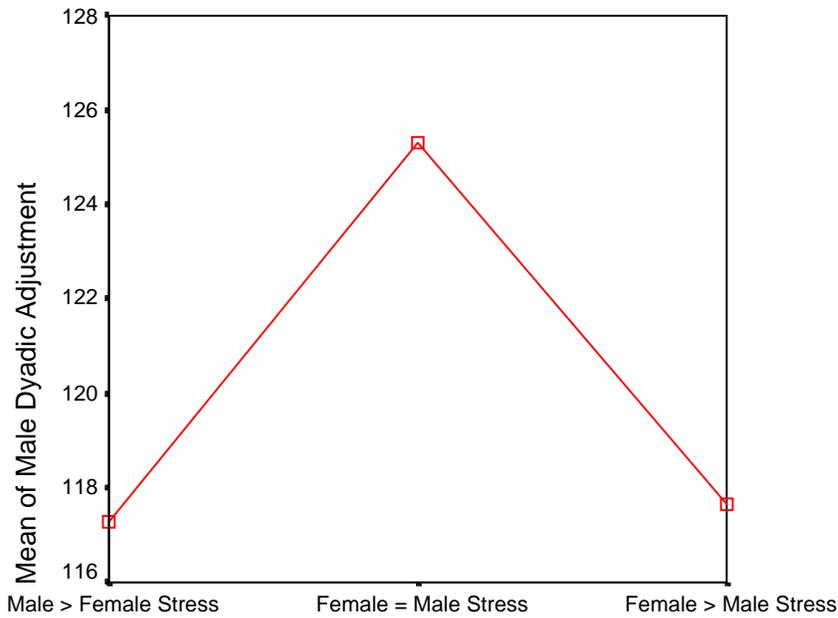
Analysis of variance and post-hoc tests were also performed on measures of male and female marital adjustment. For similar reasons as depression, it was tentatively hypothesized that couples experiencing congruence in the appraisals of the infertility-related stress would show significantly higher means of marital adjustment when compared to groups who differed in the cognitive appraisals. Results from the study seemed to support this hypothesis on the scales of sexual concern, social concern, and relationship concern. Women in couples who reported congruence in the appraisal of the infertility-related stress reported significantly higher marital adjustment than couples whose appraisals were incongruent on the scales of relationship concern ($F = 8.8, p < .001$) and social concern ($F = 5.6, p < .001$) (see figure 2). Women in couples reporting congruence related to sexual concern reported significantly higher marital adjustment scores than couples where the female experienced a greater amount of stress than the male ($F = 8.3, p < .001$). For males, those in couples who reported congruence on their appraisals of infertility-related stress reported significantly higher marital adjustment than men in the other two groups on the scales of relationship concern ($F = 12.9, p < .001$), sexual concern ($F = 6.5, p < .01$), and social concern ($F = 5.6, p < .01$) (see Figure 1). These findings suggest that congruence between couples with regards to their appraisals of infertility-related stress related to

Figure 2: Profile of Mean Differences of Female and Male Marital Adjustment in Couples Experiencing Perceived Infertility Stress Related to Social Concern



Couple Differences Social Concern -- 3 Groups

$F = 7.9$ $p < .01$. * Post-hoc test revealed significant differences between f=m and m>f and f>m group



Couple Differences Social Concern -- 3 Groups

$F = 5.6$ $p < .01$. * Post-hoc test revealed sig differences between f=m and m>f and f>m group

sexual, social, and relationship concern have a significant impact on the levels of marital adjustment experienced by both men and women in the couple.

Because, in general, the sample was not depressed as measured by the BDI, a sub-sample of couples whose members both scored 10 or greater on the BDI was analyzed to assess the results of these findings on a depressed population (n=24). Due to the small sample size, post-hoc results were not provided and significance was not assessed. The results from the analysis were only used to provide support for the idea that in depressed populations, congruence between couples may reduce the levels of depression and increase the levels of marital adjustment in infertile men and women.

Comparisons on all of the sub-scales of the FPI were not possible as all three groups were not always represented due to the small sample sizes. Preliminary results showed that males in couples with congruent levels of stress reported lower scores of depression on the BDI when compared to the other two groups in terms of relationship concern (female = male stress, mean BDI = 10; male stress > female stress, mean BDI= 18; female stress > male stress, mean BDI = 14). In terms of marital satisfaction, women in couples displaying congruence on measures of social concern, scored approximately 23 points higher than females in couples where male stress was greater and approximately 18 points greater than women in couples where female stress was higher (female = male stress, mean =127; male stress > female stress, mean 104; female stress > male stress, mean =109).

These findings seem to support the idea that congruence between couples relational and social infertility-related stress may play an important role in curbing the negative effects of depression and marital satisfaction in depressed populations. However, it is important to note that these findings are not significant and are not supported by adequate sample sizes. They are

strictly anecdotal and cannot be generalized to any population. Further studies are needed to assess this important relationship among infertile and depressed populations.

CHAPTER V

DISCUSSION

The purpose of this study was to explore the impact of congruence between couples' cognitive appraisals of infertility-related stress and its effects on depression and marital satisfaction in infertile men and women.

Summary of Key Findings

This study provided support for the idea that couples experiencing congruence on measures of infertility-related stress report lower scores of depression on the BDI and higher scores of marital adjustment on the DAS, especially when differences are measured in terms of sexual, social, and relationship concern.

Differences between couples' evaluations of infertility-related stress were significantly correlated with female depression. However, no significant correlation existed between couple differences on measures of infertility-related stress and male depression. Regression analyses further showed that differences between couples on each of the five sub-scales of the FPI were predictive of female depression, but not male depression. These findings may be explained partially because women are twice as likely as males to be depressed in the general population (Llewellyn, et al.1997). However, these findings may also be reflective of differences in male and female coping styles with regards to infertility-related stress. Because women are already more likely to report higher levels of depression, differences with their partner's regarding infertility-related stress may exacerbate their depressive symptoms. Although men do not report higher levels of depression, their lives may be negatively impacted by these differences in other areas that were not measured by the instruments used for this study. Newton et al., (1999) noted that the FPI may "lack sensitivity to male depression, or male coping strategies may continue to

mask the effects of infertility. Research that combines a measure of infertility-related stress with measures of coping may help to clarify this interaction” (p. 59).

Analysis of variance between couples that had high levels of agreement concerning the impact of infertility-related stress and couples who differed in their appraisals of the stress showed they differed significantly in their levels of depression and marital adjustment. For both men and women, couple differences on the scales of social concern, sexual concern, and relationship concern were consistently related to higher levels of depression and lower levels of marital adjustment. These differences were greater for women in terms of depression, but were relatively equal for both genders when examined by marital adjustment.

The findings seem to suggest that congruence between couples with regards to infertility-related stress in these areas may act as a buffer that helps lessen the negative symptoms that are associated with these stressors. These findings also seem to support prior research which shows that high levels of agreement between couples and families related to the stresses they experience, helps them in successfully managing the impact of these stressful life events (Snell & Rosen, 1997). The potential reasons for increased depression and lower levels of marital adjustment with regards to couple’s differences related to social concern, sexual concern, and relationship concern will now be discussed.

Social Concern

Social concern, as measured by the FPI, examined the participants’ sensitivity to comments about their infertility and the participants’ perception of the stressful nature of the reminders of infertility. It also explored participants’ feelings of social isolation and any alienation they may feel from their family and peers. In terms of depression, women in couples who were not congruent regarding social concern were shown to have higher scores of

depression on the BDI when compared to women in couples who perceived the stress equally. This may be for several reasons. First, previous research has shown that infertility is linked to a dramatic change in women's social relationships when compared to minor changes in the social relationships of men. Women are often cut off from previous friendships with those whose time is now dominated by caretaking and domestic responsibility, while men's friendships often are relatively unchanged (Daniluk, 1997). These significant social alterations may be viewed as such a loss by the woman that it contributes to feelings of depression related to the infertility. In terms of differences with their spouse related to these concerns, it is possible that women in couples who perceive social stress equally with their partners may experience greater amounts of support from their partner compared to women in couples who view the stress differently. This support is likely to act as a buffer against the negative symptoms resulting from the stress related to social concern, and may essentially curb the negative effects of depression.

Sexual Concern

In terms of sexual concern, the FPI measured areas of diminished sexual enjoyment or sexual self-esteem. It also assessed the difficulty of scheduling sexual relations between the couple. Couples reporting equal levels of stress with regard to sexual concern reported lower scores of depression and higher scores of marital adjustment when compared to couples differing in their perceptions of sexual concern. Prior research has documented the direct relationship that exists between infertility-related stress and decreases in couples' sexual satisfaction. Hirsh and Hirsh (1989) found that infertile couples experienced significantly less sexual satisfaction than the couples in control groups. Couples who view the stress of infertility related to their sexual relationship differently may be even more likely to experience greater amounts of stress than couples who perceive the stress more equally. Even though the stress related to the sexual

concern is likely to decrease the overall adjustment of the couple, this added stress of disagreement with regards to their sexual related stress may be viewed in light of the “pile on” component of the stress and coping theoretical framework (McCubbin & Patterson, 1982). The additional stress of disagreement about the couple’s sexual stress is added to the original stress of dissatisfaction related to the couple’s sexual relationship, which may deplete even more of the couple’s resources and result in lower levels of marital adjustment for both partners.

Relationship Concern

Congruence related to couples’ perceptions of their relationship concern was significantly related to lower scores of depression and increased levels of marital adjustment in both men and women. Relationship concern as measured by the FPI was defined as experiencing difficulty talking about infertility and having concerns about how the infertility may impact a couple’s relationship. For men and women who have difficulty talking about infertility, hidden fears such as the end of the relationship or the potential for extramarital affairs may especially affect the individual’s assessment of the couple’s marital adjustment. Studies have shown that it is not uncommon for the infertile partner to expect his or her partner to leave the relationship in pursuit of a fertile partner (American Fertility Society, 1992, Ulbrich, Coyle, & Llabre, 1991). Couples who differ in their responses to questions such as “because of infertility, I feel my partner and I drifting further apart,” may be at risk for lower marital adjustment due to the added strain of incurring the stress. This same rationale may also apply to couples who differ with their partner regarding the potential outcome of their relationship.

Infertility-Related Stress, Depression, and Marital Adjustment

This study confirmed findings consistent with a wide body of literature that while both males and females report infertility as a stressful experience, females perceive it as more

stressful and generally seem to be more affected in terms of negative life consequences (Greil, 1997; Robinson & Steward, 1996). Females in the study perceived infertility as more stressful than males on each of the five sub-scales and global scale of the FPI. Females also reported higher scores on the BDI when compared to men.

In terms of depression rates in the sample, the majority of men and women in the study were not in the depressed range when measured by the BDI. Thus, it is important when examining differences between groups with regards to depression, higher levels of depression on the BDI are still below the clinical range of an individual reporting depressive symptoms. These findings were unexpected, particularly for women. While prevalence rates of depression are greater for women in the general population when compared to men (Llewellyn, et al., 1997), research among infertile women has also shown that they are likely to experience higher levels of depression when compared to fertile women (Domar, et al. 1992). Domar found that 37% of infertile women scored in the depressed range compared to 18% for fertile women. In the current study, only 18% of women scored in the depressed range suggesting that female depression is underrepresented in the current study. Only 8% of men reported being in the depressed range. However, no comparable baseline was available as no studies have been conducted examining depression rates in infertile men. The lower depression rates in the sample may be partially attributable to the selection of couples who completed the study data collection instruments three months prior to their first advanced infertility treatments. Couples in this stage of infertility may be more hopeful that participation in the treatment program will result in pregnancy when compared to those who have previously undergone advanced treatments.

When examining levels of marital adjustment of the study subjects, both genders reported higher than average levels of marital adjustment when evaluated by standardized measures

(DAS). Over 94% of men and 93% of women reported scores above the adjustment point of 100 as indicated by the DAS, with mean scores of 118.0 and 117.9, respectively. Although several anecdotal reports have described infertility as a “brutal and unanticipated shock” and “a crisis that may affect the couple’s future life goals and dreams,” these findings are consistent with a larger body of literature indicating that “marital satisfaction among the infertile is as high, or higher than that of non-infertile individuals” (Greil, 1997, p. 1683). In a study examining the impact of psychological distress and marital satisfaction men and women, Callan (1987) found that infertile women tend to have lower levels of psychological well-being but reported higher levels of marital satisfaction than women who had children (p. 854). The above-average scores of marital adjustment may also be explained by the treatment selection criteria at the London Health Sciences Center, which required couples to be “stable” before qualifying for advanced infertility treatments. It is possible that this requirement may have led to social desirability biases for men and women completing the study (e.g., couples whose marriages were not well adjusted but who greatly desired to utilize advanced infertility treatments may have provided inflated estimates of marital adjustment in order to avoid denial of services based on the perceived stability of their relationship). Finally, the high levels of marital adjustment may also be related to the timing of data collection. Prior research has shown that the duration of treatments may have a deleterious effect on the couple’s overall level of adjustment. Berg and Wilson (1991) found couples who had above-average levels of marital satisfaction during the first two years of infertility treatment reported dramatically lower levels of marital adjustment after the third year of treatment, which approached the clinical cutoff point of 100. Couples in this study completed the data collection measures three months prior to their first treatment

cycle. Thus, the duration of infertility treatments was not a significant factor when assessing their overall adjustment, but may become more important as treatments continue.

Study Limitations

It should be noted that the current study contained a number of limitation which should be taken into account when examining the findings. First, as with the majority of infertility research, this study is limited by its use of a purposive sample of couples who are pursuing advanced reproductive technologies. As such, the results are limited in their generalizability. Because of their availability and willingness to participate in studies, couples pursuing advanced infertility treatments are often asked to participate in studies examining the emotional effects of infertility. This sampling method fails to capture approximately 25% of infertile couples who do not have the resources to pursue infertility treatments or who elect not to pursue infertility treatment.

Second, data on the ethnicity of study participants was not collected. However, in a previous article summarizing the data from which the sample was taken, Newton et al. (1999) noted that the sample was comprised primarily of patients who are Caucasian. As a result, minority groups were underrepresented, which is a second common limitation to the infertility literature as a whole. Because infertility research primarily uses convenience samples of white middle-class couples, “a select group of the infertile, who are almost certainly not representative of the infertile population as a whole, speak for the whole group” (Greil, 1997).

Third, the study is limited in that it used couples who indicated high overall levels of marital adjustment and low overall levels of depression. For the purposes of this study, this factor was a limitation in that variations in marital adjustment and depression were examined.

Although differences among groups were found, the differences were found in the well-adjusted range of both measures, thus limiting the clinical significance of the findings.

Fourth, because over 70% of the sample had a female factor diagnosis (e.g., tubal factors, endometriosis), this represents a highly skewed sample of the infertility population. It has been estimated that 40% of infertility is attributable to females, 40% to males, and 20% to a combination of male and female factors (Robinson & Steward, 1996; Wright, Allard, Lecours, and Sabourin, 1989). Because over 70% of participants in this study had a female factor diagnosis, couples with a male factor diagnosis were underrepresented. A study by Ulbich, et al., (1990) had similar sample limitations due to the underrepresentation of male factor infertility. Male infertility accounted for only 11% of cases, while female infertility accounted for 68% of the cases, and approximately 20% were a combination of both. The authors speculated that this may be a function of men being more reluctant to discuss their infertility and seek social support.

Clinical Relevance

Treatment Implications

Several authors have discussed the clinical implications of working with infertile populations. Shapiro (1982) compared the treatment of infertility to the resolution of the grief cycle often used with bereaving individuals. He advocates that therapists should help assist infertile couples resolve each stage of the grieving process as it appears. Sadler and Syrop (1987) discuss treatment of infertility from a systems perspective incorporating the couples' interactions with their experience within the medical treatment system. McDaniel, Hepworth and Doherty (1992) use a biopsychosocial/systems model in their treatment approach. They emphasize the use of outside support systems and also stress the importance of the therapist's education with regard to infertility issues. Devereaux and Hammerman (1998) also propose a

theory of grief resolution and encourage therapists to help clients to not label themselves as infertile, but to view themselves as going through “the experience of infertility.”

The findings in this study suggest that therapists could consider using a different and unique approach to helping couples deal with the stress of infertility. This study seems to suggest that if couples come to a level of agreement about the impact of the stressful nature of the experience, it may act as a buffer against negative outcomes such as increased levels of depression and lower levels of marital adjustment. When working with couples dealing with the experience of infertility, therapists could assess the couple’s views of the stress related to the infertility by having each member of the couple independently complete the FPI. The therapist could then assess the level of the couple’s congruence with particular attention being paid to perceptions of their sexual, social, and relationship concern. If couples demonstrated a wide discrepancy between the levels of stress in these areas, the therapist could inquire if these differences are affecting the couple. If difficulties concerning the differences existed, the therapist could normalize the incongruence noting that couples are likely to experience infertility-related stress in different ways and also at different stages. The therapist could also help the couple develop empathy for the other’s perceived level of stress, and appreciate, rather than be threatened by, these differences.

Although attempting to achieve congruence may be helpful to some couples, it has limitations. First, it is not the only factor that may affect the outcomes of depression and marital adjustment for infertile men and women. The stressors of sexual concern, relationship concern, or social concern are still present in both individuals even if the couples agree on the level of stress they report from these factors. Second, for couples who have a large discrepancy, therapists run the risk of marginalizing the feelings of the partner experiencing more stress,

especially if treatment interventions are aimed at targeting them as the problem. Because couples often do not come to resolution of their grief at the same time, therapists must be sensitive when working to achieve more congruence between couples. The fact that only approximately 10% of couples in the sample experienced infertility-related stress equally informs us as to how rare this situation may actually be.

Suggested Future Research

This study opens an important door for future research related to couples' congruence to the stress of infertility and its effects on individual functioning (e.g., depression, marital adjustment). This is the first such study to examine the impact of congruence related to couples' perceptions of infertility-related stress. Carefully designed quantitative research studies that further examine this issue are warranted. Research conducted in this area should be closely linked with theoretical considerations to provide meaningful and reliable results that will be useful to both researchers and clinicians.

In addition to quantitative studies, qualitative research can provide a meaningful medium to better understanding the emotional experience of infertility for couples. Qualitative studies could help reveal the complex processes of infertility and how these processes affect the psychological distress of both men and women. A well-designed qualitative study could interview men and women who report high differences on the FPI to try and understand if these differences affect their overall levels of depression and marital adjustment.

More longitudinal studies that track changes in infertile couples' attitudes and perceptions would also be of great value. Because infertility is often viewed as a static event, it is difficult to see the changing attitudes of couples dealing with infertility over time (Daly, 1992). To address these concerns, more longitudinal studies as opposed to cross-sectional

designs would be appropriate, emphasizing the effects of timing, duration, and changes in infertility-related stress, especially with regards to changes in the overall level of congruence between couples perceptions of infertility-related stress.

Finally, further examination of the relationship between congruence, depression, and marital adjustment in more depressed and less adjusted populations would be useful in assessing the validity of these preliminary findings. The findings from this study seem to show that congruence of appraisals between couples' with regard to their infertility-related stress is an important factor in lessening the severity of negative outcomes such as higher levels of depression and lower levels of overall marital adjustment. More controlled studies specifically designed to address this important issue would expand the research base in this area as well as benefit clinicians and infertile couples who are currently undergoing the stress related to infertility.

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The Fertility Problem Inventory (Partial Instrument)

The following statements express different opinions about a fertility problem. Please place a number on the line to the left of each statement to show how much you agree or disagree with it.

Please mark every item. Use the following response categories:

- | | | |
|---|---|---------------------|
| 6 | = | strongly agree |
| 5 | = | moderately agree |
| 4 | = | slightly agree |
| 3 | = | slightly disagree |
| 2 | = | moderately disagree |
| 1 | = | strongly disagree |

Social Concern

- It doesn't bother me when I am asked questions about my infertility
- I can't help comparing myself with friends who have children

Sexual Concern

- I feel I have lost my enjoyment of sex because of the fertility problem
- Having sex is difficult because I don't want another disappointment

Relationship Concern

- My partner doesn't understand the way the fertility problem affects me
- My partner and I could talk more openly about our fertility problem
- Because of infertility, I worry that my partner and I are drifting apart

Rejection of Childfree Lifestyle

- Couples without a child are just as happy as those with children
- I could see a number of advantages if we didn't have a child (or another child)

Need for Parenthood

- Pregnancy and childbirth are the two most important events in a couple's relationship
- My marriage needs a child (or another child)
- As long as I can remember, I've wanted to be a parent

For a complete copy of the instrument, please contact
 Christopher Newton, Ph.D.
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 London Health Sciences Center
 London, Ontario Canada
 519-685-8300 x 32477

Dyadic Adjustment Scale (Partial Instrument)

Spanier, G.B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. Journal of Marriage and the Family, 38, 15-28.

Most persons have disagreements with their relationships. Please indicate below the appropriate extent of the agreement or disagreement between you and your partner for each item on the following list:

5	=	Always agree
4	=	Almost always agree
3	=	Occasionally disagree
2	=	Frequently disagree
1	=	Almost always disagree
0	=	Always disagree

- _____ Handling family finances
- _____ Matters of recreation
- _____ Religious matters
- _____ Demonstration of affection
- _____ Philosophy of life
- _____ Making major decisions
- _____ Leisure time interests

Please indicate below approximately how often the following items occur between you and your partner

1	=	All of the time
2	=	Most of the time
3	=	More often than not
4	=	Occasionally
5	=	Rarely
6	=	Never

_____ How often do you discuss or have you considered divorce, separation, or terminating the relationship?

_____ How often do you and your mate leave the house after a fight?

_____ Do you ever confide in your mate?

Beck Depression Inventory (Partial Instrument)

Beck, A.T., Rush, A.J., Shaw, B.F., & Emery, G. (1979). Cognitive Therapy of Depression. Guilford, New York.

As you fill out this questionnaire, read each item carefully and circle the number next to the answer that best reflects how you have been feeling during the past few days. Make sure you circle one answer for each of the twenty-one questions. If more than one answer applies to how you have been feeling, circle the higher number. If in doubt, make your best guess. Do not leave any questions unanswered.

- 0 I do not feel sad
- 1 I feel sad
- 2 I am sad all the time and I can't snap out of it
- 3 I am so sad or happy that I can't stand it

- 0 I am not particularly discouraged about the future
- 1 I feel discouraged about the future
- 2 I feel I have nothing to look forward to
- 3 I feel that the future is hopeless and that things cannot improve

- 0 I get as much satisfaction out of things as I used to
- 1 I don't enjoy things the way I used to
- 2 I don't get real satisfaction out of anything anymore
- 3 I am dissatisfied or bored with everything

- 0 I don't cry any more than usual
- 1 I cry more now than I used to
- 2 I cry all the time now
- 3 I used to be able to cry, but now I can't cry even though I want to

- 0 I have not lost interest in other people
- 1 I am less interested in other people than I used to be
- 2 I have lost most of my interest in other people
- 3 I have lost all of my interest in other people

- 0 I can sleep as well as usual
- 1 I don't sleep as well as I used to
- 2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
- 3 I wake up several hours earlier than I used to and cannot get back to sleep

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EDUCATION

Master's Degree, Marriage and Family Therapy, Virginia Tech, August 98 – August 00
· 3.91 overall grade point average
· Interests: infertility, marriage and family relationships, couples therapy, couple intimacy, parent-child relationships, efficacy of therapy

Bachelor of Science, Brigham Young University, April 1995

- 3.80 overall grade point average
- Major: Psychology
- Minor: Business Management

WORK

EXPERIENCE

Staff Liaison, Board of Trustees, American Psychiatric Association

Washington, D.C., June 1998-August, 2000

- Maintained daily contact with the APA President and Medical Director
- Attended APA Board meetings and report actions taken by the Board
- Reviewed and reported public policy determined by APA Board
- Maintained the flow of information between APA staff and Board of Trustees

Network Coordinator, Practice Research Network (PRN), American Psychiatric Association, Office of Research, Washington, D.C., June 1995-June 1998

- Coordinated the *National Survey of Psychiatric Practice* including sampling, survey design, implementation, and analysis
- Analyzed and summarized findings for publication in peer-reviewed journals
- Coordinated specific PRN studies including tracking, follow-up, and database development
- Provided research assistance on PRN study designs and other methodologic issues

CLINICAL

EXPERIENCE

Family Therapist Intern, Center for Family Services, Falls Church, VA, September 1999- present

- Provide marriage and family therapy to a broad range of clinical populations
- Develop treatment approaches through group case planning sessions
- Receive individual and group supervision (both live and video)

Co-Facilitator, Men's Anger Management Group, Center for Family Services, Falls Church, VA, November 1999- present

- Co-conduct weekly class on anger management
- Help educate group members about alternatives for abuse and control
- Work with men to create better solutions to conflict
- Assist group in understanding and breaking the patterns of abuse

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CLINICAL EXPERIENCE (Cont)

Listener, Northern Virginia Hotline, Arlington, VA, May 1997-May 1998

- Managed calls from individuals experiencing a wide range of problems including loneliness, depression, grief, relationship difficulties, abuse, rape and suicide
- Provided empathetic reflective listening to all callers
- Linked callers to appropriate community services through referrals

Patient Assistant, Arlington Hospital, Center for Psychiatric and Addictions Treatment, Arlington, VA, October 1996-May 1997

- Talked with and listened to patients suffering from severe mental illness
- Attended Affective Disorders Workgroup with patients
- Assisted nursing staff in coordinating and directing patient activities

Assistant Case Manager, City of Alexandria Mental Health Center, Patrick Street Clubhouse Program, Alexandria, VA, November 1996-March 1997

- Provided needed services for individuals suffering from severe mental illness (e.g., grocery shopping, transportation, supplies for continuing employment)
- Linked clients to appropriate community services through needs assessment

TEACHING EXPERIENCE

Instructor, Missionary Training Center, Provo, Utah, May 1993-April 1995

- Taught a five-week training program to volunteer missionaries
- Provided interactive feedback on missionaries' teaching performance
- Conducted weekly interviews and evaluated missionaries' personal progress

Teaching Assistant, Dr. Harold Miller, Brigham Young University, Department of Psychology, Provo, Utah, September 1993-April 1994

- Conducted and supervised group discussions
- Graded essay examinations and weekly papers
- Consulted with students and evaluated student performance
- Conducted one lecture per semester

VOLUNTEER EXPERIENCE

Intern, American Psychiatric Association, Washington, D.C., April 1994-August 1994.

- Coordinated the implementation of two Psychiatric Research Network pilot studies
- Implemented pilot study data collection, tracking, and follow-up systems
- Co-authored paper analyzing preliminary findings from network pilot studies
- Responded to verbal and written inquiries concerning DSM-IV

ACHIEVEMENTS

Dean's List, 1990, 1994, 1995
Alvina S. Bennett Academic Scholarship
Member Golden Key National Honor Society
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SKILLS

Microsoft Word, Excel, Access, Power Point, Explorer, Lotus Notes, Type 45 wpm

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Golf, movies, television production, travel, tennis, camping and backpacking

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PUBLICATIONS

CHAPTERS

Peterson BD, West JW, Tanielian, T, Pincus HA, et. al., *Mental Health Practitioners and Trainees*. Center for Mental Health Services. In Mental Health United States, 1998. Manderscheid R and Henderson, M.J., eds. Department of Health and Human Services Pub (SMA) 99-3285. Washington, D.C., U.S. Government Printing Office, 1998.

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ARTICLES

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PRESENTATIONS *Male and Female Emotional Response to Infertility: A Proposal for DSM-V*. Collaborative Family Health Care Coalition, Bethesda, Maryland, January 2000.

Characterizing Psychiatry: Findings from the 1996 National Survey of Psychiatric Practice. American Psychiatric Association (APA) Annual Meeting, San Diego, CA, May 1997

Characterizing Psychiatry: Findings from the 1996 National Survey of Psychiatric Practice. American Psychiatric Association (APA) Institute on Psychiatric Services, Washington, D.C., October 1997