ABSTRACT

Title of Document: SELF-COMPASSION, HOPE, AND WELL-BEING OF WOMEN EXPERIENCING PRIMARY AND SECONDARY INFERTILITY: AN APPLICATION OF THE BIOPSYCHOSOCIAL MODEL

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Infertility is a medical issue faced by 1 in 10 couples in the United States, and holds the potential to have especially profound psychological effects on women. The current study examined the well-being of 119 women experiencing primary infertility and 53 women experiencing secondary infertility. Utilizing the biopsychosocial model, this study explored the biological variable of infertility type (i.e., primary or secondary); the psychological variables of self-compassion, hope, subjective well-being, and fertility-related stress; and the social variable of online support group use. Data were collected using an online survey and correlations and regression analyses were run to assess for relationships between the variables of interest and for moderation and mediation. No significant differences were found in the reported levels of subjective well-being or fertility-related stress in the two groups of women. Yet the type of infertility moderated the relationship between hope and fertility-related stress and for women with primary infertility, self-compassion mediated the relationship between hope and positive affect and negative affect. Additionally, both hope and self-compassion predicted significant variance in all dependent variables beyond that predicted by demographic and biological

variables for both groups of women. These findings suggest the importance of considering positive psychological variables when working with women experiencing infertility.

SELF-COMPASSION, HOPE, AND WELL-BEING OF WOMEN EXPERIENCING PRIMARY AND SECONDARY INFERTILITY: AN APPLICATION OF THE BIOPSYCHOSOCIAL MODEL

By

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Chapter One

Introduction

Since antiquity, the problem of infertility has been described in literature, art, and myths. Suggested causes of infertility have ranged from neuroses to witchcraft and proposed solutions have ranged from eating spiders to digesting the eye of a hyena with licorice and dill (Burns & Covington, 2006). Researchers no longer look to folklore to address infertility, and advanced medical treatments have provided a more thorough understanding of the biological causes and solutions for infertility. Yet some mental health specialists note the need to address more fully the psychosocial components of infertility (Cwikel, Gidron, & Sheiner, 2004). Nearly one in ten couples faces either primary or secondary infertility (Burns & Covington, 2006), with primary infertility defined as the inability to achieve a pregnancy after 12 months of unprotected intercourse and secondary infertility defined as the inability to conceive after previously experiencing a successful pregnancy. As they respond to the pervasiveness of infertility and begin to explore the differential experiences of those with primary and secondary infertility, many reproductive centers are beginning to recognize the importance of the mind-body connection and the need to examine how infertility affects all aspects of people's lives, beyond its medical impact.

The exploration of psychological issues related to infertility began in the 1930s, with researchers intending to cure women's psychological distress so that these women would become pregnant (Burns & Covington, 2006). Although the field of fertility counseling has evolved significantly since then, especially within the last thirty years,

much remains unknown about the relationship between psychological functioning and infertility. In the area of reproductive health, the mind-body connection is elusive.

In a review of the literature, Greil (1997) divided infertility research on psychological aspects into studies that support the psychogenic hypothesis and those that provide evidence for the psychological consequences hypothesis. The psychogenic hypothesis asserts that infertility results from psychological causes whereas the psychological consequences hypothesis claims that psychopathology stems from experiencing the stress of infertility (Greil, 1997; Menning, 1980). The psychogenic hypothesis has been discredited for a multitude of reasons, including for implying causal pathways without adequate empirical evidence. However, its remnants have been repackaged in the hypothesis that stress leads to infertility (Wasser, Sewall, & Soules, 1993), and infertility-related stress continues to be explored as a potential contributor to the etiology of some types of infertility (Cwikel et al., 2004; Domar, Seibel, & Benson, 1990). In contrast, studies that are subsumed under the psychological consequences hypothesis often analyze whether the rates of psychological distress are higher for this population in comparison to "normal populations" (e.g., Adler & Boxley, 1985; Callan, 1987; Fekkes et al., 2003), finding much conflicting evidence (e.g., Bringhenti, Martinelli, Ardenti, & La Sala, 1997; Edelmann & Connolly, 1998). Finally, to move beyond infertility as either a cause or effect of psychological distress, the biopsychosocial model has been introduced as a third framework portraying an interactional relationship between biological, psychological, and social factors related to functioning and infertility (Burns & Covington, 2006; Cwikel et al., 2004), and warrants further exploration.

Over seventy years after researchers first addressed psychological aspects of infertility (Burns & Covington, 2006), the focus has shifted from determining the causal pathway between psychological distress and infertility to identifying the risk and protective factors for psychological distress in individuals experiencing infertility. Health is no longer seen merely as an end state comprised of the absence of disease; instead, health lies on a continuum (Hoffman & Driscoll, 2000). Even in the face of medical conditions such as infertility, it is important to address positive aspects of adjustment and well-being (Hoffman & Driscoll, 2000). In infertility research, investigation has begun of potential risk factors, such as gender and type of infertility, as well as of possible protective factors, including coping strategies and self-esteem. Implementing a biopsychosocial framework, this study examined these specific risk and protective factors to expose which individuals confronting infertility might have a high need for psychological intervention.

It has been reported that when faced with infertility, women experience greater psychological distress than men (Pasch, Dunkel-Schetter, & Christensen, 2002). Further, among women receiving donor eggs as part of their infertility treatment, those with primary infertility reported higher levels of depression than women with secondary infertility (Epstein & Rosenberg, 2005). In addition, it has been found that when infertility is perceived as a problem, women with primary infertility have lower life satisfaction than women with prior children (McQuillan, Stone, & Greil, 2007).

Researchers frequently explore the relationship between psychological health and coping strategies within the infertility population, finding that escape/avoidance coping and emotion-focused coping are associated with greater psychological distress (Daniluk

& Tench, 2007; Hynes, Callan, Terry, & Gallois, 1992) and that problem-focused coping is related to greater well-being (Hynes et al.). Moving beyond the traditional conceptualizations of coping, new coping strategies related to the mind-body connection, such as meditation, relaxation, and mindfulness, are beginning to be implemented as techniques for reducing psychological distress among people experiencing infertility (Lemmens et al., 2004). For example, a recent randomized controlled study demonstrated that women undergoing in vitro fertilization who participated in an Eastern Body-Mind-Spirit (EBMS) group intervention reported a significant drop in state-anxiety in comparison to a control group that received no intervention (Chan, Ng, Chan, Ho, & Chan, 2006). Although not statistically significant, the treatment group also had a higher pregnancy rate (Chan et al., 2006). Chan et al.'s study suggests the potential of coping strategies built on the mind-body connection for infertile populations.

Across a wide range of studies, the relationship between self-esteem and the experience of infertility has been investigated frequently (e.g., Daniluk & Tench, 2007; Fouad & Fahje, 1989; Klock & Greenfeld, 2000). In addition to being explored as an outcome variable that is negatively associated with infertility, self-esteem has been found to mediate the relationship between infertility-related stress and life quality (Abbey, Andrews, & Halman, 1992). Bringhenti et al. (1997) identified self-esteem as one of several protective factors against psychological distress for infertile women. However, outside of the infertility literature, self-esteem has been criticized for being derived from performance evaluations made of oneself and others and for its trait-like nature that makes it a difficult point of intervention (Neff, Kirkpatrick, & Rude, 2007). In summary, an overview of risk and protective factors for individuals experiencing infertility reveals

that women with low self-esteem and avoidance and emotion-focused coping strategies experiencing primary infertility are at risk for psychological distress.

Recognizing these risk factors and the need to improve protective factors for people experiencing infertility, Domar, Seibel, and Benson (1990) developed a Mind/Body Program that incorporated a behavioral treatment approach. Utilizing the structure of the Mind/Body Basic Program developed by New England Deaconess Hospital and Beth Israel Hospital, the authors added sessions on cognitive-behavioral techniques, yoga, and self-empathy and compassion. The relationship between infertility and cognitive-behavioral techniques and yoga have begun to be explored (Domar et al., 2000; Khalsa, 2003), yet no research exists on the relationship between self-empathy and compassion with infertility.

The construct of self-empathy has been described in qualitative research (Jordan, 1989), but recently more attention has been given to empirically examining the construct of self-compassion. Stemming from Buddhist philosophy, self-compassion embodies treating oneself kindly during painful experiences or failure (i.e., self-kindness); recognizing one's painful experiences or failure as part of the human experience (i.e., common humanity); and implementing mindfulness skills rather than ruminating in the face of painful experiences or failure (i.e., mindfulness) (Neff, 2004). Neff (2003) developed the Self-Compassion Scale to measure the six dimensions of self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Self-compassion has been found to correlate positively with life satisfaction, positive affect, and self-esteem and to correlate negatively with depression, anxiety, self-criticism, and rumination (Neff, 2003; Neff, Hsieh, & Dejitthirat, 2005; Neff, Rude, & Kirkpatrick,

2007). Moreover, self-compassion's component of mindfulness relates to an emphasis on meditation in place of avoidance and emotion-focused coping, both of which are coping techniques that have been associated positively with psychological distress among individuals experiencing infertility (Daniluk & Tench, 2007; Hynes et al., 1992). It also is suggested that self-compassion represents a more malleable point of intervention than self-esteem, and thus would be easier to increase than self-esteem (Neff, Kirkpatrick, & Rude, 2007). Perhaps most interestingly, it has been proposed that the positive mental health effects of self-esteem might more accurately be attributed to higher levels of self-compassion; self-compassion might more adequately capture the protective effects of self-esteem without its negative comparative elements (Leary, Tate, Adams, Allen, & Hancock, 2007).

Domar et al. (1990) identified the potential of self-empathy and compassion for improving the well-being of women experiencing infertility, but it is necessary to examine self-compassion empirically before its application in interventions for this population is justified. Thus far, self-compassion research has been done mainly with college student populations. More research is needed on how self-compassion relates to well-being and adjustment for individuals experiencing infertility, including research on for whom it might be most beneficial.

In addition to self-compassion, hope represents another variable that might be beneficial to study in relation to women's well-being when experiencing infertility. For this population, a three-phase model of hope has been described: (1) the hope for pregnancy, (2) a period of acceptance that their hopes may not be realized, and (3) a final phase of creating new hopes and dreams (Bergart, 1998). General hope, beyond the hope

for pregnancy, has been identified as critical for the well-being of women experiencing infertility (Benyamini, 2003; Bergart), yet it has not be studied quantitatively. Snyder's (1985) hope theory offers a general framework for understanding the agency and pathways that individuals use to move toward the goals that comprise their hopes. Hope theory has been studied in relation to illnesses, including arthritis (Laird, 1992), spinal cord injuries (Elliott, Witty, Herrick, & Hoffman, 1991), and breast cancer (Stanton et al., 2000), although it has not been examined in relation to infertility. However, high levels of hope have been connected to improved adjustment for those with other physical ailments (Snyder, Rand, & Sigmon, 2005). The focus on hope within qualitative infertility research indicates its relevancy for this population, and a quantitative and standardized definition of a generalized form of hope as applied to this population can further understanding of whether hope represents a variable that can improve the adjustment of women experiencing infertility.

Before further addressing the potential of self-compassion and hope for improving the lives of the infertility population, it is important to note that a wide range of outcomes has been utilized when assessing the well-being of these individuals and that the operationalization of these outcomes has been inconsistent. The terms happiness, well-being, life satisfaction, and subjective well-being often have been used interchangeably (Kohler, Behrman, & Skytthe, 2005; McQuillan et al., 2007), and have been measured in divergent ways (Abbey et al., 1992; Brothers & Maddux, 2003; Williams, 1997), thereby making it difficult to ensure the construct validity of these terms with populations experiencing infertility. A more consistent and validated framework of well-being is needed in infertility research, such as that presented by Emmons and Diener (1985)'s

concept of subjective well-being (SWB). As outlined by Diener and others (e.g., Diener, Emmons, Larsen, & Griffen, 1985; Diener, Suh, Lucas, & Smith, 1999; Ryan & Deci, 2001), subjective well-being consists of a cognitive self-assessment of life satisfaction and the emotional experience of positive and negative affect. To the extent that one experiences a high level of positive affect, a low level of negative affect, and a high level of life satisfaction, one is considered to have high subjective well-being (Deci & Ryan, 2008).

The measurement of infertility adjustment also has faced inconsistencies, but recently Newton, Sherrard, and Glavac (1999) presented empirically supported domains integral to the assessment of infertility-related stress: social concerns, sexual concerns, relationship concerns, attitude toward a childfree lifestyle, and the need for parenthood. These domains are considered to be sensitive to detect stress and adjustment issues unique to infertility populations (Newton et al.). Although the reliability and validity of Newton et al.'s measure of stress related to infertility adjustment has begun to be established, further investigation is necessary.

Of the five domains of infertility-related stress, as defined by Newton et al. (1999), two describe intrapersonal factors (i.e., attitude toward childfree lifestyle and need for parenthood) and three describe interpersonal factors (i.e., social concerns, sexual concerns, and relationship concerns). Infertility research has examined interpersonal factors extensively, largely focusing on the traditional social support networks of family and friends, and has reported that the experience of infertility can be associated with stress in the interpersonal relationships that typically comprise social support networks (Mindes, Ingram, Kliewer, & James, 2002). Recent studies report that an increasing

number of individuals are turning to the Internet to connect with others also experiencing infertility. Internet resources, such as infertility-specific online support groups, are providing a space in which individuals can discuss their symptoms, news about their treatment progress, and feelings of depression, among many other topics (Epstein, Rosenberg, Grant, & Hemenway, 2002).

The experience of infertility can be devastating for some women, including those with and without previous children. The biopsychosocial framework suggests the importance of conducting further research on the relationships between risk and protective factors with well-being and fertility adjustment, and the central purpose of this study was to explore these variables more closely. More specifically, the purpose of this study was to identify whether there was a strong positive relationship between self-compassion and hope with subjective well-being and a negative relationship between self-compassion and hope with infertility-related stress. In addition, by using samples of women who are experiencing primary or secondary infertility, this study shed light onto for whom self-compassion and hope might be most relevant.

Chapter Two

Review of the Literature

Infertility can represent a life event that leads women to question their life meaning as they experience feelings of helplessness, isolation, and guilt (Bridges, 2005). It is estimated that between 80 million and 168 million individuals are affected by infertility worldwide (Burns & Covington, 2006). Roughly one in ten couples will experience either primary or secondary infertility (Butler, 2003; Vayena, Rowe, & Peterson, 2002). Among the worldwide population, primary infertility rates have been estimated to range from 1 to 8% and secondary infertility has been estimated to be as high as 35% (Burns & Covington, 2006). Within the United States, approximately 7.3 million women and their partners experience infertility, or around 12% of the population currently at reproductive age (U.S. Department of Health and Human Services, 2002).

Although much research has explored the relationship between infertility and negative psychological factors (e.g., Cwikel et al., 2004), more information is needed on protective factors that contribute to positive functioning in the face of infertility. The long history of studying individuals' experience of infertility can be categorized according to the following hypotheses: infertility stems from psychological causes (psychogenic hypothesis); psychological consequences result from the experience of infertility (psychological consequences hypothesis); and an interactional and multi-dimensional relationship exists between the biological status of infertility, psychological states, and the social environment (biopsychosocial approach) (Burns & Covington, 2006; Cwikel et al.; Greil, 1997).

This literature review first outlines the basic tenets of each of these approaches to understanding infertility. After establishing the historical context of current frameworks for infertility research, this literature review then examines biological, psychological, and social variables using the biopsychosocial model. More specifically, the biological status of having infertility, differences between primary and secondary infertility, the role of gender, and stress were first addressed. In addition, self-compassion, hope, and subjective well-being were presented as forms of positive psychological variables that hold relevance for individuals experiencing infertility. Finally, fertility adjustment as it relates to social interactions and the use of online support systems was described. The relationships between each of these variables with other biopsychosocial factors were included.

Psychogenic Theories

During the 1930s, psychogenic infertility theories were introduced as a means of demonstrating that psychopathology contributed to infertility (Berg, Wilson, & Weingartner, 1991). Stemming from Freudian psychoanalytic ideology, psychogenic infertility theory postulates that individuals' unresolved conflicts from early life experiences or their unconscious defense mechanisms contributed or led to infertility (Benedek, 1952) by upsetting individuals' natural hormonal flow (Epstein, 2003). Mostly, these theories focused on the women's psychological problems at the neglect of the potential contribution of men's psychological state. For example, psychogenic theorists offered five categories of women who suffered from infertility: (1) the resentful woman, (2) the neurotically lonely woman, (3) the ignorant woman who considers sex dirty, (4) the immature or weak woman who fears not being a good parent, and (5) the

average or normal woman who sometimes has sterility problems (Marsh & Vollmer, 1951). Other reasons for women's infertility were theorized as their unconscious hatred towards their husbands, fear of sexual intercourse (Epstein, 2003), undifferentiation from their mothers, and not wanting to have to compete with an unborn child (Fischer, 1953; Rothman, Kaplan, & Nettles, 1962). According to the few psychogenic infertility theories that addressed male contributing factors, men's problems with sterility frequently resulted from having domineering and manipulative mothers or feeling conflicted about becoming a parent (Rubenstein, 1951).

Psychogenic infertility theories remained in favor until the 1970s, at which time reproductive medicine began to greatly advance (Burns & Covington, 2006). The medical community held onto psychogenic infertility theories for so long because these theories provided a reason for infertility resulting from an unknown etiology (Epstein, 2003). Rather than blame endocrinologists or medical treatments for their failure to help a couple conceive, according to psychogenic infertility theories, the infertile women could only blame themselves for the unconscious forces that were blocking their fertility (Epstein, 2003). Yet there was little evidence of psychological problems causing infertility and as reproductive medicine advanced to more accurately and frequently diagnose infertility problems, less credence was given to psychogenic infertility theories (Denber, 1978; Edelmann & Connolly, 1986; Noyes & Chapnick, 1964; Walker, 1978). Further, research based on psychogenic infertility theories has been criticized for its reliance on convenience sampling methods, its lack of representativeness and generalizability, its inconsistent measurement of psychological causes, its failure to use control groups, its primary focus on female infertility at the neglect of male infertility,

and its conclusions regarding causality without empirical justification (Greil, 1997). Recently, the psychogenic hypothesis has been repackaged in studies examining the relationship between stress and infertility, which were more closely examined in this literature review.

Psychological Consequences Theories

During the late 1970s, psychological consequences theories began to gain more credence (Burns & Covington, 2006). Based on the concept that infertility is the source of psychological distress, psychological consequences theories combine elements of development, trauma, and bereavement theories. Difficulties having children theoretically represent a roadblock for the developmental adult task of achieving intimacy and generativity, thereby resulting in either distress or growth as part of the path towards homeostatis and regaining stability (Burns & Covington, 2006; Menning, 1980). Therefore, infertility signified a major life crisis that had predictable stages or patterns, and Menning was among the pioneers in drawing attention to the need for psychological support in addition to medical treatment for individuals experiencing infertility.

In his review of the literature of psychosocial aspects of infertility, Greil (1997) divides research on the psychological consequences into that which is descriptive and into that which tests this theory. Rather than examining whether individuals experiencing infertility are better or worse psychologically than the general population, the descriptive literature simply intends to capture the complexity of infertility (Greil, 1997). As outlined by Greil, descriptive studies of the psychological consequences theory have addressed the following central themes: infertility as a dominant part of identity, especially women's identity (e.g., Olshansky, 1987); a sense of loss of control and the

struggle to regain it (e.g., Becker, 1994); feelings of inadequacy, especially experienced by women (e.g., Valentine, 1986); ambiguous sense of status in society (e.g., Sandelowski, 1987); infertility resulting in stress in the marital relationship and sexual stress, while also holding the potential to bring couples closer (e.g., Sabatelli, Meth, & Gavazzi, 1988); a sense of separation and alienation from those who are parents (e.g., Sandelowski & Jones, 1986); feelings of social stigmatization (e.g., Whiteford & Gonzalez, 1995); the struggle to make meaning of the infertility experience (e.g., Greil, Porter, Leitko, & Riscilli, 1989); submersion/immersion in the medical treatment and resulting stress from medical procedures (e.g., Blenner, 1992); and stressful relationships with medical providers (e.g., Becker & Nachtigall, 1991). In contrast, research testing the psychological consequences theories compares the psychological distress experienced by individuals facing infertility to distress expressed by the general population, often finding conflicting results.

Research on self-esteem and subjective well-being traditionally has followed the psychological consequences hypothesis. But studies examining self-esteem as a predictor variable have raised questions about the assumed directionality between infertility and psychological distress, and the complexity of the many factors that impact the experience of infertility are beginning to be addressed in psychological outcome approaches, including in the biopsychosocial model.

Psychological Outcome Theories and the Biopsychosocial Model

Multiple infertility theories have been suggested to capture the social and cultural elements not accounted for in psychological consequences theories. These alternative theories include the psychological cyclical model, the psychosocial context approach, and

the psychological outcome approach (Burns & Covington, 2006), all of which add elements to more accurately represent the complexity of the relationship between infertility and psychological variables. The cyclical model acknowledges the bi-directional interaction between psychological states, such as stress, and the medical condition of infertility. Yet its over-focus on women's stress levels at the neglect of men's stress levels and its failure to address the contextual factors that affect stress have raised questions about its applicability (Burns & Covington). The psychological context approach moves beyond the systems addressed in the psychological cyclical approach to include cultural and environmental factors, which are beyond the scope of this study. For the purposes of the present study, the biopsychosocial framework, based on the psychological outcome approach, was adopted because it includes the reciprocal mind-body interaction as well as an inclusion of social support factors, elements of which could be addressed in the scope of this research.

Engel (1977, 1980) presented the biopsychosocial model in stark contrast to the biomedical model, thereby moving beyond the over-simplistic relationship between biological factors and health outcomes to identify the role of psychosocial factors in disease. Engel's (1977, 1980) biopsychosocial model of health outcomes portrayed the reciprocal influence of biological, psychological, and social factors. In his depiction of the relationships between biopsychosocial factors, Engel utilized a hierarchical structure that recognized implicitly certain systems as more important than others. Moreover, Engel conceptualized health as the absence of disease; the goal of biopsychosocial processes was to remove disease.

Yet in its definition of health, the World Health Organization (1948) acknowledged that "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." In addition, the continued use of a hierarchy to conceptualize the relationship between biopsychosocial factors complicates the ease with which the integration of biological, psychological, and social variables can be conceptualized (Hoffman & Driscoll, 2000). A hierarchy implies concise boundaries between the effects of biological, psychological, and social variables on health outcomes.

Proposing that biological, psychological, and social factors overlap more than what is depicted in Engel's (1977, 1980) model, Hoffman and Driscoll (2000) present a concentric biopsychosocial model of health. At the innermost layer of these concentric circles lies health status, the center of the model. The term "health status" is used rather than disease to emphasize that well-being exists on a continuum, and that higher levels of health status are not dependent entirely on the absence of disease (Hoffman & Driscoll, 2000). For instance, individuals may have an illness yet still experience well-being due to their subjective perceptions of their health status. Psychological well-being must be considered in addition to physical well-being when attempting to capture individuals' overall level of health (Hoffman & Driscoll, 2000). The factor of psychological well-being is captured in the second innermost layer of concentric circles, termed the psychosocial contributors, which surrounds the health status factors. Outside of the psychosocial contributors is the biosocial contributors (e.g., culture, race, gender), with the biomedical contributors (e.g., genetics, disease symptoms) comprising the outermost layer of concentric circles. The innermost layers of health status and psychosocial

contributors are most adaptable and can be affected more easily than the biosocial contributors and the biomedical contributors.

The concentric biopsychosocial model is relevant for women experiencing infertility because it acknowledges that health is more than the mere absence of disease (i.e., infertility) and that it is important to explore positive components of adjustment (Hoffman & Driscoll, 2000). Self-compassion and hope represent two positive psychological factors that could affect adjustment positively, and thereby relate to the health status of women experiencing infertility. The present study addressed the psychological contributors of self-compassion and hope in a population facing the biomedical condition of infertility. Furthermore, a social contributor to health status was explored indirectly by collecting information on how women with infertility utilize infertility-specific online support groups. Finally, subjective well-being and fertility adjustment were addressed as two outcome variables related to health status for this population.

Although this study drew from the concentric biopsychosocial framework, it did not test fully this model. The biopsychosocial model postulates that psychosocial contributors may mediate the relationship between biomedical conditions and health status. Because the psychological contributors of hope and self-compassion have never before been studied in infertile populations, it could be premature to suggest that they serve as mediators between infertility and well-being outcomes. Furthermore, the social contributor in this study only was assessed indirectly through use of online support groups. Before the biopsychosocial model could be tested directly in this study, exploratory analyses of the relationships between the psychosocial contributors, the

biomedical condition of infertility type, and health status embodied in subjective well-being and infertility-specific stress needed to be conducted. However, the biopsychosocial model was used to conceptualize the relationships between the variables on a broad level. The biopsychosocial framework highlights the importance of moving beyond the experience of psychological distress to include the social environment as well as the positive functioning and well-being of individuals experiencing infertility. Because of the intricate and multi-dimensional interactions between the contributing factors for the well-being of this population, it is critical to learn more about specific areas of intervention, including self-compassion and hope, that can improve quality of life. For too long, individuals with infertility have been treated using only a medical model, and their strength, resilience, and positive functioning has been overlooked.

Biological Variables

The infertile and the fertile. The biological state of having infertility has largely been explored as it relates to psychological outcomes through comparisons of women with infertility and "women, in general" or "normal women." Largely, this research has reported conflicting evidence regarding the propensity of women facing infertility to have higher levels of psychological distress, although studies have found evidence for slight differences that are clinically insignificant in the areas of depression, anxiety, and self-esteem (Greil, 1997). In comparison to a control group of women not undergoing infertility treatment, Hynes, Callan, Terry, and Gallois (1992) found that women participating in IVF reported more symptoms of depression, lower self-esteem, and decreased self-confidence. In addition to increased levels of anxiety and depression, women experiencing long-term infertility have also been described as exhibiting more

hostility and health complaints (van Balen & Trimbos-Kemper, 1993). In a study comparing men and women's differential psychological responses to infertility, women reported more anxiety, depression, hostility, stress, and lowered self-esteem than did men but the couples did not report significantly high levels of marital or sexual distress (Wright, Duchesne, Sabourin, Bissonnette, Benoit, & Girard, 1991). However, both women and men receiving infertility treatment expressed more psychological distress than same-sexed population norms on the measure of psychiatric symptoms (Wright et al., 1991).

Yet, in studies that report a difference between levels of psychological distress for women experiencing infertility and the general population, questionable methodology often raises doubts about the validity of the results. More specifically, small-sample sizes (Ellsworth & Shain, 1985), non-representative samples (i.e., overreliance on White, middle-class women seeking treatment for infertility), and failure to account for participants' fertility history as well as their treatment history represent methodological issues (Greil, 1997). For example, Domar, Broome, Zuttermeister, Seibel, and Friedman (1992) found that infertile women had significantly higher scores on two measures of depression and twice the prevalence of depression than a control group of women. Yet the control group consisted of 39 women whereas the experimental group consisted of 338 women (Domar et al.). It would be unlikely that a control group of such a small size could offer enough statistical power to legitimately compare the two groups. In short, the imbalance in the sample size of the control and experimental groups threatens the validity of Domar et. al's conclusion that infertile women experience significantly more depression than fertile women. Similar methodological issues plague the majority of

research comparing “normal women” and infertile women, making it difficult to understand what protective factors might help women when facing the difficult and often distressing experience of infertility.

Although methodological limitations in Domar et al.’s (1992) study made it difficult to compare women experiencing infertility with women who were not, this study provided other useful information about infertility; women who had experienced infertility for two to three years had higher depression scores than women who had experienced infertility for less than one year or for more than six years and women with an identified cause of infertility reported higher depression than women with unexplained infertility. These results speak to the importance of examining the process of infertility, and not confounding the effects of infertility from the effects of infertility treatment (Greil, 1997). Furthermore, more information is needed on those who do not seek infertility treatment to better understand the effects of infertility separate from the effects of infertility treatment (Greil, 1997).

Studies finding similar psychological health for populations experiencing infertility and the general population have examined anxiety, depression, self-esteem, marital/partner satisfaction, and sexual functioning, among other variables (e.g., Bevilacqua, 1998; Bringhenti et al., 1997; Klock & Greenfeld, 2000). These findings suggest that the psychological problems that are reported by women experiencing infertility pre-existed their infertility treatments. However, the classification of infertility requires that women do not experience pregnancy for a period of at least twelve months, and women typically wait an indeterminate period of time before seeking treatment for infertility. Although it is possible that the experience of infertility does not necessarily

cause psychological maladjustment for all women (Bevilacqua, 1998), difficulties in establishing a beginning point in time for infertility problems muddle the distinction between preexisting psychological problems and psychological problems related to infertility.

Edelmann and Connolly (1998) acknowledge that much like the general population, individuals experiencing infertility are a heterogeneous group. A 2002 survey found no pattern for infertility in relation to education, income, or race (U.S. Department of Health and Human Services, 2002). Demographic data reveals that 7.7% of Hispanic women, 11.5% of African American women, and 7.0% of White women experience infertility (U.S. Department of Health and Human Services, 2002). Moreover, educational level is not a significant factor with 10.4% of this population not having completed high school degree, 6.5% having completed high school, 6.6% having completed some college, and 8.4% having received a bachelor's degree or higher (U.S. Department of Health and Human Services, 2002). Of demographic variables, age has the strongest relationship with infertility, with 11% of women ages 15-29, 17% of women ages 30-34, 23% of women ages 35-39, and 37% of women ages 40-44 experiencing infertility over a 12 month period (U.S. Department of Health and Human Services, 2002). The heterogeneity of women experiencing infertility is exemplified further when considering the different types of infertility, such as primary and secondary infertility.

Primary and secondary infertility. Individuals are diagnosed with primary infertility when they have been unable to achieve a pregnancy after 12 months of unprotected intercourse. In contrast, the diagnosis of secondary infertility is used when individuals have difficulty conceiving after previously experiencing a successful birth

(LaJoie, 2003), and includes those who used reproductive technology, such as IVF, to achieve their first birth. Therefore, a portion of those with secondary infertility have a history of fertility problems that precedes the birth of their first child, thereby complicating the boundaries between primary and secondary infertility (LaJoie, 2003). In the late 1980s, 30% of women diagnosed with infertility were categorized as having primary infertility in comparison to 70% of infertile women being diagnosed with secondary infertility (Hirsch & Mosher, 1987). In 1995, 2.1 million couples were identified as infertile, with slightly more than half experiencing secondary infertility (U. S. Department of Health and Human Services, 1995). A more recent survey reported that of the 7.3 million U.S. women with impaired fecundity, 41% (3 million) had primary infertility and 59% (4.3 million) had secondary infertility (U. S. Department of Health and Human Services, 2002). Unfortunately, prior research provides an incomplete picture of the experience of infertility by grouping primary and secondary infertility together. Of the few studies that differentiate between individuals with primary as opposed to secondary infertility, this research reveals differing psychosocial adjustment depending on infertility type (Covington & Burns, 2006; Simons, 1998).

In a study on couples preparing for egg donation at an IVF clinic, women and their husbands with primary infertility reported significantly higher depressive symptomology than women and their husbands with secondary infertility. These differences in depression scores for primary versus secondary infertility held across gender, with primary group husbands having higher levels of depression than secondary group husbands and primary group wives having higher levels of depression than secondary group wives. However, the husbands in both groups had lower levels of

depression than their wives, with this discrepancy being the largest for the primary infertility couples (Epstein, 2005). Women without prior children among a sample of female infertility patients at a medical clinic reported higher levels of depression in comparison to women with prior children, although anxiety did not relate to the presence of children (Bevilacqua, 1998). These findings offer support for the psychological consequences hypothesis that infertility causes some form of psychological distress and therefore, those with the more medically challenging infertility diagnoses (i.e., primary infertility) would be expected to have more severe psychological distress.

But the challenges of facing secondary infertility are not to be minimized. The experience of secondary infertility presents its own unique challenges. Women with secondary infertility have reported a sense of isolation not only from the fertile world and those who can achieve pregnancy without difficulty, but also from the infertile world (Simons, 1998). Because women with secondary infertility already have a child, it is often perceived that they should be happy and not selfishly want more. Their desire for additional children can be perceived as greedy, and those with secondary infertility might feel that the message from the infertility community is that having one child should be enough. Yet, having only one child is often stigmatized in society, and individuals with secondary infertility often face difficult and probing questions about why they have not had more children (Simons, 1999). Further, for those who achieved their first pregnancy through the use of reproductive technology, experiencing infertility for a second time can reawaken the painful feelings present during the primary infertility experience (LaJoie, 2003). In short, the grief and adjustment to secondary infertility is challenging in a way that is different from that of individuals who have not had a child.

Research has revealed the complexity in comparing the grief and adjustment of women with primary and secondary experiences. In her infertility study, Bevilacqua (1998) found that women with a previous child exhibited less depression than women with no prior children, yet the two groups had similar anxiety levels. In their research on infertility and life satisfaction among women, McQuillan, Stone, and Greil (2007) described a complicated relationship between motherhood and life satisfaction. More specifically, mothers had higher life satisfaction than non-mothers when controlling for fertility status, minority status, and health, but this association between life satisfaction and motherhood disappeared when controlling for life course cues and resources. Instead, the authors attributed the relationship between motherhood and life satisfaction to shared associations with marriage; marriage was more closely associated with life satisfaction than motherhood or infertility. In addition, they found that only under certain conditions did infertility have a negative association with life satisfaction. For those who did not perceive their infertility status as a problem, those who were mothers (i.e., those experiencing secondary infertility) had higher life satisfaction than those who were not mothers (i.e., those experiencing primary infertility). Women who perceived their infertility as a problem but were already mothers (i.e., secondary infertility) did not have significantly lower life satisfaction, but those who were not mothers (i.e., primary infertility) reported significantly lower life satisfaction. McQuillan et al. concluded that the diagnosis of infertility is not enough to impact life satisfaction; the perception of infertility as a problem and the inability to achieve biological motherhood is more important for life satisfaction.

Although researchers are beginning to address the differential infertility experiences tied to the diagnosis as either primary or secondary, much of the literature in this area is anecdotal and not empirically based. The studies completed by Epstein (2005) and McQuillan et al. (2007) represented the only two articles empirically comparing primary and secondary infertility, and each had limitations in its generalizability. Epstein's study lacked generalizability beyond couples seeking egg donation, and only a small percentage of infertile individuals pursue egg donation. Furthermore, McQuillan et al.'s compared women with primary infertility to those who had prior children, including non-biological children. It is impossible to discern how much McQuillan et al.'s sample accurately represents women with medically-diagnosed secondary infertility. In short, more information is needed on the varying biopsychosocial experience of women with different types of infertility.

Stress as a causal factor. Although psychogenic infertility theories have been discredited on many accounts, studies of stress as a causal factor for infertility have revived certain aspects of these theories. Based on evidence that lower stress levels in males and females result in improved natural fertility, researchers have reconceptualized the psychogenic infertility theory to call for more experimental research on whether lower levels of stress result in improved fertility in men and women who are undergoing infertility treatment (Campagne, 2006). Yet a multitude of factors make it difficult to establish a single causal pathway between stress and infertility.

Advances in neurobiology are beginning to establish the relationship that stress has with the hypothalamic-pituitary-adrenal (HPA) axis, with the hypothalamic-pituitary-gonadal (HPG) axis, and with other hormonal systems. The interaction of stress and the

HPA axis affect fertility directly through hormones such as GnRH, prolactin, LH, and FSH, and indirectly through hormones such as cortisol, melatonin, and endogenous opiods (Campagne, 2006). Yet biological markers of stress are often inconclusive (Campagne, 2006), and it is difficult to determine how to best measure aspects of stress that relate to infertility. Ferin (1999) suggested that each specific stress response potentially could activate HPA through a unique pathway that differentially impacts ovarian hormones. Therefore, Campagne argues that finding no relationship between psychological stress and IVF treatment outcomes (Harlow et al., 1996; Milad, Klock, Moses, & Chatterton, 1998) might be due to the use of invalid markers for stress. The current lack of valid stress markers relevant for fertility outcomes represents one roadblock in experimentally validating stress's effect on fertility.

Differences in the effects of pre-existing chronic stress, or anxiety, versus acute stress, or stress caused by fertility procedures or the fertility problem, also compound the relationship between stress and fertility, with the existence of chronic stressors elevating the neuroendocrine response to acute stressors. For instance, Demyttenaere, Nijs, Ever-Kiebooms, and Koninckx (1991, 1992) found that women with chronically ineffective coping strategies had higher anticipatory stress to infertility, which in turn, was associated with lower pregnancy rates. In other words, the pre-existence of chronic stressors was negatively associated with the response to acute stressors in women undergoing infertility treatment. However, the state trait anxiety measures often used in infertility research do not capture the presence of chronic stress, and thus self-report stress measures can offer an incomplete picture of the relationship between perceived stress and biological stress markers (Gold, Zakowski, Valdimarsdottir, & Bovbjerg, 2003;

Campagne, 2006). The acute stress connected to the experience of infertility needs to be explored independently from levels of chronic stress (Demyttenaere et al., 1991; Eugster, Vingerhoets, van Heck, & Merkus, 2004) and future research could assess both acute and chronic stress before as well as during infertility treatment through the use of multiple biological and psychological measures (Campagne, 2006).

One study that distinguished between procedural and baseline stress for women undergoing in vitro fertilization (IVF) or gamete intrafallopian transfer (GIFT) reported that procedural stress related to the number of oocytes retrieved and fertilized whereas baseline stress additionally impacted pregnancy, live birth delivery, birth weight, and multiple gestations (Klonoff-Cohen, Chu, Natarajan, & Sieber, 2001). Thus, procedural stress, or the stress inherent in infertility treatment procedures, was not associated with pregnancy or the rate of live births. In contrast, women's stress levels at the beginning of their treatment predisposed them to negative IVF or GIFT treatment outcomes. Arguably, the treatment of individuals' baseline stress is as important, if not more important, than that of their procedural stress (Campagne; Klonoff-Cohen et al., 2001).

Campagne (2006) outlines two factors in chronic stress that largely affect how people's psychological state and mood will impact their fertility: coping and self-esteem. McEwan (2005) has called for improving the efficacy of individuals' adaptive response to stressors without over-activating the stress-related biological systems involved. Self-compassion was presented as a relevant factor for women experiencing infertility because of its relevance to coping strategies and self-esteem in the face of chronic stress without over-activity in the stress systems.

Furthermore, the relevance of acute stress due to infertility should not be neglected. After all, acute stress has been established as an independent marker for pregnancy outcomes due to its relationship with the number of oocytes retrieved and fertilized (Klonoff-Cohen et al., 2001). Yet acute stress related to infertility differs significantly from acute stress caused by other life experiences, and its unique elements deserve consideration. Newton, Sherrard, and Glavac (1999) developed the Fertility Problem Inventory (FPI) to assess perceived infertility-related stress in the domains of social concern, sexual concern, relationship concern, need for parenthood, and rejection of childfree lifestyle. In addition, the FPI provides a global score capturing overall infertility-related stress. Although it is beyond the scope of this thesis project to test psychogenic infertility theories by establishing directional relationships between infertility-related stress and reproductive outcomes, this project will utilize the FPI to gain a better understanding of which variables might moderate and mediate the stress-infertility relationship, including the variables of self-compassion, hope, and type of infertility. Campagne (2006) argues that psychological interventions directed at lowering stress levels for individuals undergoing infertility treatment should be introduced early in the treatment process because they represent a less invasive, less expensive, and non-controversial method for enhancing fertility. The findings from the present study suggested whether interventions directed at improving the levels of self-compassion and hope for women experiencing infertility might be worthy of further study.

Gender differences. Across a multitude of studies, gender has been associated with whether individuals perceive infertility as a problem. Women report greater levels of infertility distress than men (Greil, 1997), including higher levels of depression, stress

(Peterson, 2006), and lowered self-esteem (Wright, Duchesne, Sabourin, et al., 1991). Currently, no studies have reported that infertile men had higher levels of psychological distress than infertile women (Newton, 2006). Moreover, Newton and Houle (1993) found that women were more likely to be concerned that a fertility problem existed before even seeking treatment, to begin the dialogue with their partners about infertility, and to personally assume responsibility for difficulties conceiving. Women's greater sense of responsibility for fertility outcomes exists even when male-factor infertility has been identified, and men's level of distress equals women's only when infertility is due to a male-factor (Newton, 2006).

Newton (2006) has suggested that infertile women's sense of responsibility might provide a sense of control in the face of such difficult life circumstances. By exercising "interpretive control," these women are making meaning in the face of an often uncontrollable situation (Tennen, Affleck, & Mandala, 1991). The consequences of such self-attribution for infertility can include strong feelings of guilt, increased self-blame, decreased self-esteem (Nachtigall, Becker, & Wozny, 1992), and failure as women (Greil, Leitko, & Porter, 1988).

The factors contributing to women's greater sense of responsibility and psychological distress when experiencing infertility are extremely complex, and include variations across socioeconomic levels, cultural backgrounds, and a myriad of other variables (Newton, 2006).

In summary, the biological factors presented reveal differences in psychological functioning depending on the presence of fertility problems, the type of infertility, and the gender of the individual experiencing infertility. This study focused on the

experiences of women only, and includes women experiencing both primary and secondary infertility. It is important to explore women's experiences of primary and secondary infertility without blaming them for their reproductive difficulties, and to move beyond reporting the psychological distress experienced by women facing infertility to address protective factors that relate to their well-being and stress.

Psychological Variables

Self-esteem and self-compassion. Self-esteem relates to individuals' sense of worth and value, and higher levels of self-esteem are postulated to protect against negative effects of stress by helping individuals engage in problem-solving coping strategies and have a greater locus of control (Taylor, 1983; Tennen & Herzberger, 1987). A multitude of infertility studies have examined the relationship between experiencing infertility and lowered self-esteem, especially for women (e.g., Keye, 1984; Mahlstedt, 1985; Seibel & Taymor, 1982). For individuals whose personal identity is closely connected to their ability to be parents, infertility can threaten their self-esteem and they report feeling "damaged" (Matthews & Matthews, 1986).

In a study on infertility and well-being, Abbey, Andrews, and Halman (1992) examined self-esteem, perceived control, and interpersonal conflict between spouses as mediators of the effect of fertility problem stress on quality of life. Aiming to explore how infertility-related stress differentially impacts couples, they conducted interviews with 185 couples experiencing infertility, mainly recruited at treatment centers, and conducted in-person interviews using standardized questions. Their results revealed that husbands and wives reported related psychological states, although out of all of the psychological states reported, the lowest correlation was for husband and wives' self-

esteem. Moreover, wives' self-esteem, internal control, and global life quality scores were more strongly associated with their husbands' stress than the reverse; and wives' fertility stress related to husbands' self-esteem, internal control, and global life quality. In summary, fertility-related stress negatively impacted life quality through its negative relationship with self-esteem, internal control, and interpersonal conflict, and this relationship was stronger for the wives' life quality than for the husbands' life quality (Abbey et al., 1992).

In addition to studying lowered self-esteem as an outcome variable of the infertility experience (e.g., Pasch, Dunkel-Schetter, & Christensen, 2002; van Balen & Trimbos-Kemper, 1993), some research has examined self-esteem as a predictor or protective factor for adjustment to infertility. High levels of self-esteem along with an internal locus of control, higher socioeconomic status, and moderate age were linked to higher infertility adjustment whereas low self-esteem, advanced age, and undifferentiated sex role identity were connected to high levels of anxiety and distress (Koropatnick, Daniluk, & Pattinson, 1993). Bringhenti, Martinelli, Ardenti, and La Sala (1997) suggest that a high level of self-esteem represents one factor that allows women to deal with the experience of infertility effectively. Moreover, increased levels of self-esteem have been associated with lower levels of anxiety for pregnant women after successful fertility treatment, and interventions aimed at addressing self-esteem have been deemed beneficial for women who have experienced infertility (Cox, Glazebrook, Sheard, Ndukwe, & Oates, 2006). In summary, self-esteem represents one variable that traditionally has been explored as an outcome variable, but is beginning to be examined as a protective factor as well.

Yet, recent research has noted that self-esteem's reliance on self-evaluation and comparison with others might be related to narcissism, self-absorption, self-centeredness, lack of concern for others (Baumeister, Bushman, & Campbell, 2000; Damon, 1995; Finn, 1990; Raskin, Novacek, & Hogan, 1991; Seligman, 1995; Watson & Hickman, 1995), and distorted self-knowledge (Sedikkides, 1993; Taylor & Brown, 1988). Most measures of self-esteem have failed to separate the high regard for oneself embodied in self-esteem from feelings of superiority towards others (Neff, 2003a).

Because self-esteem is centered on one's ego, threats to that ego have been connected to violence and aggression (Baumeister, Smart, & Boden, 1996). When one's favorable opinion of oneself is threatened either by a person or a circumstance, anger directed outward may serve as a form of self-protection. Baumeister et al. (1996) concluded that individuals with an inflated or unstable self-ego may resort to violence as a means of avoiding a negative revision of their self-esteem. Moreover, in a meta-analysis of studies relating self-esteem to in-group bias, Aberson, Healy, and Romero (2000) revealed that overall, high self-esteem individuals had higher levels of in-group bias than low self-esteem individuals, suggesting the possibility that those with high self-esteem utilize their in-group bias as a means of boosting their self-concept. In short, self-esteem has been identified as a relevant variable to study in individuals experiencing infertility, but its associations with negative outcomes (e.g., narcissism) are beginning to be recognized.

In response to these criticisms of the construct of self-esteem, Deci and Ryan (1995) introduced the distinction between contingent self-esteem and true self-esteem, with contingent self-esteem stemming from comparisons with others while true self-

esteem results from fulfilling psychological needs for autonomy, competence, and relatedness. But Deci and Ryan only measure true self-esteem indirectly through its relationship with self-determination, and the autonomy component of true self-esteem would most likely result in a positive correlation with narcissism (Neff, 2003a).

Self-compassion has been presented as a construct embodying the psychological benefits of high self-esteem with fewer of its negative corollaries (Neff, 2003a; Neff & Vonk, 2009). As a Buddhist concept, self-compassion entails being touched by the suffering of oneself, offering patience and kindness towards oneself in the face of suffering, and extending understanding and nonjudgment towards one's inadequacies and failures. Moreover, self-compassion includes a recognition that one's suffering is connected to our common experience as humans, and that one is not isolated and alone in one's pain (Neff, 2003a).

The three basic components of self-compassion are (1) self-kindness, (2) common humanity, and (3) mindfulness. Although deemed distinct concepts that are experienced differentially, each causes the others to develop and grow (Neff, 2003a). Self-kindness represents treating oneself gently in the midst of suffering, and is the opposite of self-judgment, whereas common humanity, as the opposite of isolation, indicates the ability to recognize that suffering and failures are shared with others. However, self-kindness does not imply self-pity. Neff (2003a) explains that self-pity often involves feeling removed from others and being overwhelmed with one's own problems such that it is difficult to think about anyone else. Self-pity implies over-identification with one's suffering and difficulty remaining objective (Bennett-Goleman, 2001). In contrast, the common humanity component of self-compassion requires one to stay connected to the human

experience as one practices self-kindness, thereby breaking through feelings of self-absorption and over-identification (Neff, 2003a). Self-kindness in conjunction with the common humanity perspective allows one to acknowledge the depth of one's personal suffering while placing it in the context of the human experience, and therefore seeing one's pain with improved clarity (Neff, 2003a).

The third component of self-compassion, mindfulness, follows from the other two. Mindfulness, in contrast to over-identification and rumination, is a state of mind that allows individuals to observe and describe their thoughts and feelings without becoming overly engaged in them; it represents the ability to experience things as they occur in the present moment without holding on to them or pushing them away (Hayes, Strosahl, & Wilson, 1999). Self-compassion requires the ability to practice mindfulness; one must use mindfulness to not avoid one's feelings in order to express compassion towards those feelings, and mindfulness must be practiced so as not to ruminate and over-identify with one's feelings, and therefore lose sight of common humanity (Neff, 2003a). In summary, mindfulness helps decrease self-judgment, thereby increasing the possibility for self-kindness. In turn, increased self-kindness allows for the more balanced view of one's suffering that relates to mindfulness as well as to the ability to acknowledge how one's suffering is shared with others. Furthermore, if individuals can see how their suffering is shared by others, they will be less likely to judge themselves harshly, thereby engendering self-kindness and creating the emotional space to engage in mindfulness.

Neff (2003a) suggests that self-compassion might serve as a valuable emotional regulation strategy that entails a level of awareness of distressing feelings that involves kindness, acceptance, and a sense of common humanity. Because self-compassion does

not center on self- evaluation and therefore, the protection of one's self-concept (as does self-esteem), it is hypothesized that self-compassion has many of the same psychological benefits of self-esteem without its negative associations with narcissism, self-absorption, and self-centeredness (Neff, 2003a). Self-esteem often falters in the face of difficulties or failure, whereas self-compassion theoretically remains unaffected in the face of suffering (Neff, 2008). Therefore, self-compassion might especially be useful for individuals experiencing infertility as a form of emotion-focused coping with a potentially chronic stressor without over-activating emotions; self-compassion might serve as an adaptive response to the stress of infertility without over-activating the stress-related biological systems involved.

Although self-compassion has not been studied previously in populations experiencing infertility, prior research on its relationship with psychological health suggest its potential benefits for women experiencing infertility. Moreover, the prevalence of studies on self-esteem in relation to the infertility experience indicates the relevance of self-compassion for this population. It is hypothesized that it should be easier to raise levels of self-compassion than levels of self-esteem (Neff, Kirkpatrick, & Rude, 2007) and that high levels of self-compassion protect against the impact of negative events in a more beneficial manner than self-esteem (Leary, Tate, Adams, Allen, & Hancock, 2007). What has previously considered the positive effects of self-esteem may more accurately be attributed to the effects of self-compassion (Leary et al.). Finally, research on mindfulness, one of the three components of self-compassion, has been examined in the form of mind-body groups, relaxation training, and meditation interventions for populations experiencing infertility (e.g., Chan et al., 2006). A more

thorough study on self-compassion in women experiencing infertility is the next step in this line of research.

Self-compassion has been operationalized using the Self-Compassion Scale (SCS; Neff, 2003a). Using the SCS, multiple studies, mostly drawing from a college student sample, have found that self-compassion positively correlates with many markers of psychological well-being, including the following: optimism, happiness, life satisfaction, social connectedness, emotional intelligence, emotional approach coping, reflective wisdom, positive affect, extroversion, self-acceptance, mindfulness, autonomy, purpose in life, self-esteem, and mastery rather than performance goals (Kirkpatrick, 2005; Neff, 2003b; Neff, Hsieh, & Dejitterat, 2005; Neff, Rude, & Kirkpatrick, 2007). In contrast, this research reports that self-compassion negatively correlates with self-criticism, depression, rumination, anxiety, thought suppression, and neurotic perfectionism (Neff, 2003a; Neff, Hsieh, &Dejitterat, 2005; Neff, Rude, & Kirkpatrick, 2007).

Compassionate mind training (CMT) and mindfulness-based stress reduction programs have incorporated self-compassion into their interventions. Developed for individuals who struggle with chronic problems and have high levels of self-criticism, CMT aims to increase individuals' ability to self-soothe and practice self-acceptance and self-warmth (Gilbert & Procter, 2006). In one study, six individuals received two 12-hour day sessions in compassionate mind training, and were found to have reduced levels of depression, anxiety, self-criticism, shame, and submissive behavior and increased levels in the ability to self-soothe (Gilbert & Procter, 2006). Self-compassion has also directly been incorporated in mindfulness-based stress reduction (MBSR) exercises for health care professionals. An eight-week randomized controlled clinical trial found that an

MBSR intervention may improve the life quality and self-compassion of individuals working in the high-stress field of health care (Shapiro, Astin, Bishop, & Cordova, 2005). In a second prospective, cohort-controlled MBSR study design with therapist trainees, Shapiro, Brown, and Biegel (2007) reported increased positive affect, self-compassion, and mindfulness and decreased stress, negative affect, rumination, and state and trait anxiety after involvement in an MBSR intervention.

Mind body techniques were introduced to infertility treatment by Domar, Seibel, and Benson (1990) in the form of the relaxation response in a behavioral therapy intervention. Their findings that this intervention was associated with statistically significant decreases in anxiety, depression, and fatigue as well as increases in vigor demonstrated the possibility of stress-reduction techniques for those experiencing infertility. Replicating this study in a 10 week group program, Domar, Zuttermeister, Seibel, and Benson (1992) confirmed that such a group intervention was related to decreased psychological distress for this population. Domar has since established the Mind Body Institute and continues to conduct research on the effectiveness of mind-body therapy for those experiencing infertility.

Other mind-body interventions have incorporated art therapy, body-oriented techniques, and a marital group, finding promising results. But most of this line of research has taken a narrative, theoretical, or anecdotal form and more stringent scientific evaluation of the effectiveness of these programs has been called for (Lemmens et al., 2004). In response to this call, Chan et al. (2006) created a randomized controlled study of an Eastern Body-Mind-Spirit (EBMS) group intervention directed at reducing anxiety in 229 Chinese women undergoing their first cycle of IVF. The psycho-educational group

format included stress-reduction training in conjunction with tai-chi, meditation, and breathing exercises; activities such as singing, writing, and drawing focused on finding benefit and positive meaning from negative experiences; and informative lectures on the mind-body connection. The EBMS approach embodies the principle that physical, psychosocial, and spiritual well-being are interconnected and are critical in the face of stressful life events (Chan et al., 2006). Measuring outcomes during participant recruitment, two months later on the first day of ovarian stimulation, and one month later before embryo transfer, Chan et al. found that participants in the EBMS group demonstrated lower state anxiety scores than did the control group, although no changes were reported in the trait anxiety scores. A higher pregnancy rate was observed in the intervention group but did not reach statistical significance. (Chan et al., 2006). This study demonstrated the potential utility for lowering anxiety levels of women seeking IVF treatment through the use of a program devoted to achieving balance between the body, mind, and spirit. In short, although the construct of self-compassion as presented by Neff (2003a) has not been implemented in interventions for infertility directly, its element of mindfulness and its theoretical underpinnings on the mind-body connection have been shown to be relevant for infertility populations.

Hope. Hope represents another psychological variable theoretically relevant to women experiencing infertility and it has been presented as a common theme for men and women experiencing infertility in a multitude of studies (e.g., Glassbrenner, 2003; Johansson & Berg, 2005; Kalbian, 2005; Malik & Coulson, 2008). More specifically, the hope for pregnancy and for becoming a parent pervades the infertility experience, often with a special meaning for women who consider motherhood an important part of their

identity and self-worth (Benyamini, 2003; Blenner, 1992). During treatment for infertility, these women must balance their hope for children against reality of the treatment experience; they must walk a fine line between hope and fantasy (Benyamini). Two years after failed IVF treatment, a sample of Swedish couples reported still feeling hopeful about achieving pregnancy even after ending treatment (Johansson & Berg, 2005). Hope for pregnancy serves as a source of motivation to continue infertility treatments and low hope has been identified as a risk factor for infertility treatment termination (Blenner, 1992).

Bergart (1998) offers a three-phrase model of the evolution of hope for women experiencing infertility. In this study, women first enter the hope of pregnancy phase, which is characterized as stemming from women's emotional yearning for children, being fed by stories of other women overcoming unlikely odds to become pregnant, extending past the end of medical treatment, and feeling like a battle against "giving up" (Bergart, 1998). Age and/or menopause often pushed these women into the next phase of acceptance, which includes the acceptance of the likelihood that pregnancy will not occur. They also accept that they have taken all possible steps to achieve pregnancy, and therefore done all that they could. Describing acceptance as an experience that comes from "the head" rather than "the heart," these women depict the acceptance phase as somewhat fluid, with elements of hope of pregnancy still appearing occasionally. Bergart (1998) suggests that the hope of pregnancy during this phase might serve as a kind of transitional hope until the women can build new hopes and dreams. The acceptance phase offers the opportunity to rebuild their identities and sources of self-worth separate from motherhood, and to reconnect with relationships that might have felt too triggering (e.g.,

friends who were pregnant) during the hope of pregnancy phase. New hopes characterize the third and final phase, as women pursued new interests and shifted their focus to consider other life goals besides motherhood as a means of moving on. Several of the women in Bergart's study reported a shift from feeling as if they "had to" be a mother, to "wanting to" be a mother, which felt like a "release." Despite the somewhat fluid boundaries between these three phases of hope for women experiencing infertility, the final phase of new hopes was distinct from the others in its inclusion of new dreams and the vision of a positive future irrespective of fertility status. The ability to widen the scope of hope for conception to other hopes has been identified as a key component of maintaining well-being and quality of life while pursuing infertility treatments (Benyamini, 2003).

Bergart's (1998) three-part model of hope for women experiencing infertility was based on a qualitative study using a sample of nine White, middle-class, college-educated women between the ages of thirty-five and forty-five. Undoubtedly, the representativeness of her sample is questionable, and thus the generalizability of the three-part hope model to other women experiencing infertility is uncertain. Unfortunately, most studies that describe hope in women experiencing infertility faces similar issues in their research designs. Therefore, the construct of hope has failed to be fully validated for this population.

Although hope for pregnancy has been studied in multiple infertility studies, a more general level of hope has remained a neglected topic of research for this population. Hopes beyond the hope for conception have been described as important for the well-being of women experiencing infertility (Benyamini, 2003; Bergart, 1998), yet no

research could be located that explored this topic. More generally, hope theory (Synder et al., 1991) has provided a framework for how individuals pursue their goals. According to hope theory, "hope is a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-directed energy) and (b) pathways (planning to meet goals)" (Snyder, Irving, & Anderson, 1991, p. 287). The components of goals, pathways, and agency comprise hope theory. Goals direct and giving meaning to purposeful behavior and can range in size, the necessary time to accomplish, and level of abstraction (Feldman & Snyder, 2000). Agency relates to people's beliefs about their abilities to move towards their goals, their motivation to begin movement toward goals, and their ability to sustain that progress. Pathways involve the perceived ability to determine how to achieve their goals on a cognitive level; it represents the mapping of the route to achieve one's goals. Underlying hope theory is that assumption that people primarily think in terms of goals and therefore, spend much energy navigating the routes to those goals (Snyder, 2002).

As a cognitive set, hope mainly represents a manner of thinking with emotions holding a secondary, contributory role (Snyder, 2002). Accordingly, the cognitive set upon which hope is based is posited to remain consistent across time and situations (Snyder et al., 1991). Those with high levels of hope are expected to uphold their agency and pathways when confronting obstacles and to reinterpret those difficulties as challenges while maintaining a positive attitude. For those with high hope, obstacles in life are inevitable, and simply require alternate pathways and the demonstration of coping and adaptation skills (Snyder, 1994). In contrast, those with low hope should be more likely to lessen their agency and pathways in the face of difficulties (Snyder et al., 1991).

Snyder et al.'s (1991) hope theory has been empirically investigated in relation to psychological, behavioral, and physical outcomes. More specifically, Snyder's hope theory has been examined in the prevention, detection, and treatment of illness (Irving, Snyder, & Crowson, 1998; Snyder, 1996; 1998; Snyder, Irving, & Anderson, 1991) and higher levels of hope have been associated with better adjustment to severe arthritis (Laird, 1992), injuries from major burns (Barnum et al.., 1998), spinal cord injuries (Elliott et al., 1991), fibromyalgia (Affleck & Tennen, 1996; Tennen & Affleck, 1999) and blindness. The Hope Scale, based on Snyder's hope theory, has been used in studies on psychological and physical adjustment to breast cancer (Stanton, Danoff-Burg, et al., 2000) and on pain tolerance (Snyder, Odle, & Hackman, 1999; Snyder, Taylor, et al., 2001). In short, high levels of hope in general have been linked to better psychological and physical adjustment and the protective role of hope for women experiencing infertility deserves closer attention. This thesis examined more closely the relationship between hope in women experiencing primary and secondary infertility and their well-being, thereby providing a much-needed empirical approach to understanding how hope is relevant for this population.

Subjective well-being. Subjective well-being (SWB) represents individuals' self-evaluation of their well-being, or the extent to which they describe experiencing wellness. It has been operationalized as having a high level of positive affect, a low level of negative affect, and high life satisfaction (Diener, 1984). Whereas positive and negative affect capture the emotional components of well-being, life satisfaction embodies the cognitive evaluation of one's well-being. Collectively, positive affect,

negative affect, and life satisfaction exemplify happiness and minimization of pain and the maximization of pleasure (Deci & Ryan, 2008).

Although subjective well-being is considered to be relatively stable over time (Lucas et al., 2004) and personality represents one of its strongest predictors (Diener & Lucas, 1999), subjective well-being is not inalterable (Veenhoven, 1994). A robust body of literature suggests that external circumstances hold the potential to affect subjective well-being (Diener, Suh, Lucas, & Smith, 1999; Keyes, 1998: Veenhoven, 1994), and one study reported that only 10% of its participants remained in a single happiness category across time (Landua, 1992). Moreover, physical health is one of the most reliable predictors of life satisfaction (Fernandez-Ballesteros, Zamarron, & Ruiz, 2001), with perceptions of health rather than objective health status having a stronger association with life satisfaction (Brief, Butcher, George, & Link, 1993). Theoretically, infertility could be viewed as a health condition that could affect life satisfaction. Diener et al. (1999) noted the importance of moving beyond the debate about whether subjective well-being is a state or trait to gaining a deeper understanding of the circumstances surrounding negative life events' associations with life satisfaction. By examining self-compassion, hope, and type of infertility, the present study heeded Diener et al.'s call in the area of infertility.

Most infertility research broadly defines life satisfaction, and does not follow the strict construction of well-being as consisting of positive and negative affect and life satisfaction. More generally, life satisfaction has been used interchangeably with happiness, subjective well-being, and adjustment (Kohler, Behrman, & Skytte, 2005; McQuillan et al., 2007), thereby preventing cross-study comparisons of how infertility

relates to well-being. Researchers have found that infertility is negatively associated with subjective well-being and life satisfaction (Abbey et al., 1992; Bromham, Bryce, & Balmer, 1989; Callan, 1987; Callan & Hennessey, 1988), and that gender differences exist in the relationship between well-being and life satisfaction, with women faring worse than men (Anderson, Sharpe, Rattray, & Irvine, 2003; Link & Darling, 1986).

To further understand the complex relationship between infertility and life satisfaction as well as to broaden the samples used in infertility research to include those who do not seek infertility treatment as well as those who do, McQuillan, Stone, and Greil (2007) sampled 580 midwestern women ages 25 to 50 selected through random digit dialing. Utilizing a structured phone interview, McQuillan et al. (2007) examined lifetime infertility as a predictor variable, life satisfaction as the criterion variable, coping and material resources as moderators, and race/ethnicity, general health, and chronic health conditions as control variables. They found that women who described their infertility as a problem also described more chronic health problems, thereby implying that for those who perceive infertility as a problem, it was connected with their physical health and it was associated negatively with life satisfaction. Furthermore, infertility alone did not have long-term associations with life satisfaction. The negative life event of infertility was connected to life satisfaction for women with no prior children who perceived their infertility as a problem, but infertility interacted with employment status and internal health locus of control to affect life satisfaction. McQuillan et al. (2007) concluded that the status of infertility alone is not associated with decreased life satisfaction, but rather the perception of infertility as a problem and not having prior

children are connected mostly closely to life satisfaction. As Diener et al. (1999) noted, the relationship between external events and life satisfaction is multi-faceted.

It is important to examine positive and negative affect, along with life satisfaction, when studying the well-being of women experiencing infertility because these variables are used frequently as indicators of general distress (Zwick, 2004) or of emotional expressive coping for this population (Klonoff-Cohen et al., 2001; Panagopoulou, Vedhara, Gaintarzti, & Tarlatzis, 2006). Positive affect has been connected to positive problem orientation and rational problem solving (Zwick, 2004). However, an excessive amount of affect could indicate an over-activity of the body's stress response system that represents inefficiency and maladaptive coping (McEwen, 2005). In fact, for women undergoing IVF, emotional expression was predictive of lower pregnancy rates; emotional expression was concluded to be a risk factor for decreased success in IVF treatment (Panagopoulou et al., 2006). Likewise, negative affect predicted unrealistically high expectations and worse fertility adjustment for seventy-one women receiving treatment for infertility, thereby demonstrating the critical role of negative emotions for the well-being of this population (Durning & Williams, 2004). Ideally, individuals will maintain a balance of positive and negative affect in the face of infertility. In summary, subjective well-being has been defined loosely in infertility research, and more consistency in its definition is needed in order to compare findings across studies. This thesis utilizes the construct of subjective well-being as defined by Diener (1984) as a means of examining how it relates to primary and secondary infertility.

Social Variables

Social context of fertility-related stress. Women's experiences with infertility occur within a social context, and women's social resources can relate to their levels of stress (Mindes, Ingram, Kliewer, & James, 2002). The construct of fertility-related stress has been delineated in a multitude of ways. In the instrument construction of the Fertility Problem Inventory, Newton, Sherrard, and Glavac (1999) searched for five independent infertility-related domains: social concern, sexual concern, relationship concern, need for parenthood, and rejection of childfree lifestyle. Of these five domains, the three domains of social concern, sexual concert, and relationship concern lie within a social context. More specifically, Newton et al. (p. 56) define social concern as "sensitivity to comments, reminders of infertility, feelings of social isolation, and alienation from family or peers" and describe relationship concern as "difficulty talking about infertility, understanding/accepting sex differences, concerns about impact on a relationship." Sexual concern relates to decreased sexual enjoyment or sexual self-esteem, with scheduled sexual relations becoming strained. The inclusion of three social variables out of five domains key to infertility-related stress indicates the extent to which infertility is interwoven with social relationships.

Typically, social support serves as a buffer against the negative consequences of stress. Cohen and McKay (1984) outline four roles held by social support in coping with stress: offering instrumental aid such as practical support, providing appraisal support through the availability of a person with whom one can talk over problems, supplying support for one's self-esteem through comparisons with others, and giving a sense of belonging stemming from having a group with whom one can interact. Yet for

individuals with infertility, social support from others can be lacking for a wide range of reasons. Sometimes individuals with infertility are reluctant to discuss their reproductive problems openly with family and friends (Whiteford & Gonzalez, 1995). A fear of stigmatization might pervade their interactions with those who are not also struggling with infertility. In addition, they might avoid social interactions with family and friends that require them to face directly their difficulties conceiving (e.g., baby showers; Lasker & Borg, 1987). In short, infertility can result in isolation and alienation from friends and family, the people who typically form one's social support networks (Jirka, Schuett, & Foxall, 1996).

Although infertility researchers have explored extensively the relationship between the traditional forms of social support provided by family and friends and psychological outcomes (e.g., Amir, Horesh, & Lin-Stein, 1999; Hirsch & Hirsch, 1995), there is less empirical research on the specific types of social concerns unique to individuals experiencing infertility and the relationships between these specific concerns and psychological outcomes. Social support has been identified as an important resource for coping with infertility, yet the infertility literature suggests that individuals facing infertility often struggle with obtaining the support that they need from their pre-existing social networks (Domar, 1997; Lechner, Bolman, & van Dalen, 2007). Moving beyond traditional assessments of social support that are not infertility-specific, the Fertility Problem Inventory created by Newton et al. (1999) offers an opportunity to investigate more thoroughly the unique challenges of the social support network of women with infertility that might relate to stress and well-being.

Online support. Within the U.S., an increasing proportion of adults are using the Internet. More specifically, 22.1 % of American adults reported using the Internet in 1997, with that number increasing to 40% in 2000, 59% in 2002, and 78% in 2003 (Newburger, 1997; U.S. Department of Commerce, 2006). Recognizing the widespread use of the Internet for health information, the American Medical Association created guidelines for health-related online content, advertising/sponsorship, privacy/confidentiality, and e-commerce (Winker, 2002). Approximately half of individuals dealing with infertility have reported looking to the Internet for information, support, and advice (Haagen, Tuil, Hendriks, de Bruijin, Braat, & Kremer, 2003; Huang, Al-Fozan, Tan, & Tulandia, 2003; Weissman, Gotlieb, Ward, Greenblatt, & Casper, 2000), and that number likely has increased since it was reported in 2003. Recent attention has been given to establishing standards for managing infertility-related information on the Internet (Epstein & Rosenberg, 2005; Huang, Discepola, Al-Fozan, & Tulandi, 2005), and researchers are beginning to investigate the use of online bulletin boards and support groups for men and women with infertility (Glassbrenner, 2003; Malik & Coulson, 2008).

Online support groups for infertility offer the opportunity for individuals to discuss their thoughts, feelings, and questions twenty-four hours a day, seven days a week. This type of support group can provide contact with other individuals having similar infertility-related experiences, without any geographical limitations and while offer anonymity. Although infertility continues to carry a stigma for both women and men, women have reported higher levels of stigma than men (Slade, O'Neill, Simpson, & Lashen, 2007). Moreover, perceived infertility-related stigma has been linked to low

perceived social support (Slade et al., 2007). Online infertility support groups potentially represent a forum of social support not impeded by stigma.

Malik and Coulson (2008) conducted an exploratory qualitative study of 95 women and men's use of online support groups. Their participants reported that their use of online support groups decreased feelings of isolation as they realized that others shared their similar thoughts and feelings about infertility. In addition, they described how becoming a participant in an online infertility support group helped improve their relationships with their partners by providing an alternate space in which they could talk about their infertility-related emotions and thoughts. Thus, their participation in online support groups for infertility was associated with a decrease in their dependence on their partners for infertility-related support. The participants also described how learning about others' experiences with infertility empowered them to be more active in their medical treatment, and helped them feel more in control of their circumstances.

In addition, respondents communicated that they sometimes had negative reactions to the online support groups (Malik & Coulson, 2008). More specifically, reading about others' positive treatment outcomes when they were continuing to struggle with their fertility sometimes resulted in grief and distress. Some reported that they become "obsessive" in the frequency with which they visited the online support groups, and had to withdraw from the boards to stop their preoccupation with their infertility. A couple of respondents relayed that posts could be misinterpreted, leading to disagreements or misunderstandings.

Epstein, Rosenberg, Grant, and Hemenway (2002) also reported both positive and negative outcomes related to infertility-specific online support groups. They compared

self-reports from those whose only outlets (OOs) for discussing infertility were medical and support web sites in comparison to individuals had additional outlets (AOs). Statistically significant differences between AOs and OOs' use of infertility-specific online support groups were reported for the areas described below. OO participants reported using the Internet for infertility-related purposes for an average of 1.58 hours per day (SD $\pm$ 1.02) whereas AO participants reported 1.32 hours of infertility-related Internet use (SD $\pm$ 1.02). Among the OO participants, 65% described using Internet forums for sharing updates about their own treatment; 74% considered the Internet forums useful to creating a space for patients to share signs and symptoms; 61% found the Internet forums very helpful when they felt depressed; 31% received "permission" from others on the Internet forum to avoid awkward social situations, and 46% found that the Internet forums contributed to their tendency to avoid talking to "fertile others." In contrast, the proportion of AO participants using the Internet for these purposes was significantly less (respectively, 49%, 60%, 44%, 23%, and 30%). OOs also reported greater levels of depression, less real-world support, and more online support than AOs (Epstein et al., 2002). Epstein et al. (2002) concluded that the Internet can offer an additional form of social support to individuals experiencing infertility, but that those who have no other sources of support are at greater risk for depression.

Although this area of research is beginning to provide useful information about the use of the Internet by individuals experiencing infertility, more data is needed before conclusions can be made. Epstein et al. (2003) utilized a large sample size of over 500 participants, yet restricted the information gleaned from those participants through the use of quantitative surveys. More mixed-method studies are needed on this new form of

social support to fully capture its many dimensions. Malik and Coulson (2008) appropriately used a qualitative research design to capture more fully the voices of the individuals using online infertility support groups, but their lack of rigor in their methodology, and specifically in the coding of participants' responses, raises questions about their findings. To further validate Malik and Coulson's results, this thesis employed open-ended questions to allow survey respondents to express in their own words the best and worst aspects of using online support groups. In addition, likert items on the amount of time spent on infertility-specific Internet sources, the helpfulness of these online resources, and participants' reliance on these sources for support were presented to replicate and extend the findings of Epstein et al. (2003).

Positive functioning in women experiencing infertility largely has been neglected in the research literature. When it has been examined, studies have used esoteric definitions of constructs such as well-being and hope that prevent across-study comparisons of research findings. To address these limitations, this study explored the relationship of the positive psychology constructs of self-compassion and hope to the subjective well-being and fertility-specific stress of women experiencing primary and secondary infertility. This population was accessed utilizing a new-founded avenue of social support—fertility-specific online support groups.

Chapter 3

Statement of the Problem

For some women, infertility represents a difficult medical condition that threatens their sense of womanhood (van Balen & Trimbos-Kemper, 1993), control over their lives (Stanton, Tennen, Affleck, & Mendola, 1991), and life meaning (Bridges, 2005). Infertility has been associated with decreased psychological health, including grief, major depression, anxiety, adjustment disorders, and lowered self-esteem and gender differences exist in the psychological response to infertility (Cwikel et al., 2004; Pasch et al., 2002; Williams, 1997). Women usually express a stronger negative reaction than men except in cases of male-specific infertility diagnoses (Burns & Covington, 2006). The causal pathway between infertility and most psychological maladjustment remains unclear, although psychosocial stress is thought to contribute to the etiology of some types of infertility (Cwikel et al., 2004). To address stress related to infertility, group interventions have begun to address the mind-body connection (Domar et al., 1990) and incorporated elements of Eastern philosophy (Chan et al., 2006).

But before effective psychological interventions can be implemented, more needs to be understood about the unique experiences of women confronting infertility and the factors that protect against, as well as contribute to, the development of psychological maladjustment (Verhaak et al., 2005). The biopsychosocial model offers a framework that highlights the importance of addressing positive components of adjustment to a medical condition such as infertility. Using this model, biological, psychological, and social variables can be explored to provide a more complete understanding of overall health and well-being. Within the current study, the biological variable examined was the

type of infertility; the psychological variables were self-compassion, hope, subjective well-being, and infertility-related stress; and the social variable were indirectly assessed through an examination of women's use of online support groups.

The type of infertility, primary or secondary, greatly differentiates women's experiences. The few studies that have demarcated primary and secondary infertility report that women with primary infertility experience higher rates of depression and lower levels of life satisfaction, and these studies have only speculated as to the reasons underlying these differences in depression and life satisfaction (Bevilacqua, 1998; Epstein & Rosenberg, 2005; McQuillan et al., 2007).

Self-compassion represents a potential protective factor against psychological distress in women experiencing infertility. Taken from Buddhist philosophy, self-compassion entails being kind to oneself during difficult experiences or failure (i.e., self-kindness); recognizing the universality of one's painful experiences or failures (i.e., common humanity); and practicing mindfulness rather than rumination in the face of painful experiences or failures (i.e., mindfulness) (Neff, 2004). Self-compassion negatively correlates with self-criticism, depression, rumination, anxiety, thought suppression, and neurotic perfectionism and has been positively associated with optimism, happiness, life satisfaction, social connectedness, emotional intelligence, emotional approach coping, reflective wisdom, positive affect, extroversion, self-esteem, and mastery rather than performance goals (Neff, 2003; Neff et al., 2005; Neff, Rude, & Kirkpatrick, 2007). Although a relatively new construct, self-compassion holds much potential for women undergoing the painful experience of infertility and the self-compassion component of mindfulness already has begun to be incorporated in infertility

counseling interventions (Chan et al., 2006; Domar et al., 1990). However, in its nascent form, self-compassion research primarily has utilized a college population, and therefore little is known about its applicability to the general population.

Hope also represents a potential protective factor for women experiencing infertility. Specific hopes for infertility are discussed often in the infertility literature, and more recently, the importance of a more generalized sense of hope has been deemed as important for the well-being of this population (Benyamini, 2003; Bergart, 1998). Although hope has been explored in women experiencing breast cancer and in both men and women facing a multitude of other physical health conditions, no research has examined how hope predicts well-being in women experiencing infertility.

Building upon the need to expand knowledge of self-compassion and hope's effect on well-being and the need to learn more about the differences between women experiencing primary and secondary infertility, this study examined levels of self-compassion and hope in women experiencing primary and secondary infertility. Self-esteem, a close correlate of self-compassion, and hope has been shown to be a strong predictor of subjective well-being (SWB) (Diener et al., 1999; Snyder, 2002). Self-compassion and hope also have been linked positively to life satisfaction (Kwon, 2000; Neff, 2003; Snyder et al., 1996) and positive affect and linked negatively to negative affect (Neff, 2003; Snyder, 2002). Therefore, the present study served to test Leary et al.'s (2007) conjecture that the positive effects of self-esteem might be more accurately attributed to self-compassion and expanded upon current research on hope theory. Furthermore, research findings on the association between infertility and lowered SWB have been inconsistent (Anderson, Sharpe, Rattray, & Irvine, 2003; Brothers, 2000;

Williams, 1997; Wischmann, Stammer, Scherg, Gerhard, & Verres, 2001), and a recent study reported that in a sample experiencing infertility, life satisfaction was lower for those with primary infertility in comparison to women with prior children (McQuillan et al., 2007). Based upon the established differences in subjective well-being of women experiencing primary versus secondary infertility and the close relationship between self-compassion, hope, and well-being, this study assessed whether the impact of self-compassion and hope on well-being is moderated by primary and secondary infertility. In addition, the potential for self-compassion to mediate the relationship between hope and subjective well-being was assessed if the possibility of mediation was suggested by the strength of the associations between these variables. However, because this study was exploring tentative relationships between variables and offers many research questions rather than research hypotheses, mediation was considered based on initial findings and could not be presupposed.

Furthermore, to ensure that the unique experiences of women with infertility are captured, this study also examined the adjustment process specific to fertility problems. Stress has been acknowledged as both a precursor and a result of infertility, and therefore represents a critical variable related to adjustment for this population. In an empirical exploration of the domains of infertility stress, Newton et al. (1999) identified the five key domains of social concern, sexual concern, relationship concern, rejection of the childfree lifestyle, and the need for parenthood. A global measure of infertility stress based on these five domains was examined as a dependent variable in the present study.

Largely, this study focused on the biomedical and psychological aspects of the biopsychosocial model in its application of this model to the infertile population. The

social support aspect was incorporated through the use of online social support networks for participant recruitment. Further, a select few quantitative as well as qualitative questions served to contribute information to the burgeoning online infertility social support research. Although the biopsychosocial model has been used before in infertility research, the variables of self-compassion and Snyder's hope theory (1995) have never before been explored in relation to infertility. As a result, this study primarily posited research questions rather than research hypotheses. The differential experiences of those with primary and secondary infertility have begun to receive empirical exploration, and thus were investigated as research hypotheses. But the remaining relationships to be addressed in this study drew from theoretical connections, not empirical associations, and were presented as research questions.

Research Hypotheses

Hypothesis 1: Women with primary infertility will report lower levels of subjective well-being than women with secondary infertility.

Hypothesis 2: Women with primary infertility will report higher levels of infertility-related stress than women with secondary infertility.

Although there is not an extensive literature on women with primary infertility in comparison to women with secondary infertility, the few such studies that examine the presence of offspring in relation to infertility have reported differential experiences for those with no children (i.e., primary infertility) and those with prior children (i.e., secondary infertility) (Bevilacqua, 1998; Newton, Hearn, & Yuzpe, 1990; Newton et al., 1999). Implementing a random digit dialing procedure to sample 580 U.S. women ages 25 to 50, McQuillan, Stone, and Greil (2007) found that among women who self-

identified as having an infertility diagnosis and perceived infertility as a problem, women without prior children reported lower life satisfaction than women with children. McQuillan et al. failed to limit their definition of mothers who had problems with infertility to only those with medically defined secondary infertility, and instead considered women to be mothers (and therefore not fall into the category of primary infertility) if they had given birth to at least one child, were close to at least one stepchild, had adopted at least one child, had raised a child as their own (e.g., informal foster care), or some combination of these categories. Despite the ambiguous categorization of non-mothers and mothers, the study's findings indicate that women with a prior child have higher life satisfaction. Moreover, in research implementing the medical definition of primary and secondary infertility among donor egg recipients, Epstein and Rosenberg (2005) found that women with primary infertility have higher rates of depression than women with secondary infertility. These studies suggest that women with primary infertility will have lower levels of life satisfaction but higher levels of infertility-related stress than women with secondary infertility, which also was expected in the current study.

Research Questions

Question 1a. For women experiencing primary infertility, does the level of self-compassion positively correlate with subjective well-being?

Question 1b. For women experiencing secondary infertility, does the level of self-compassion positively correlate with subjective well-being?

Question 1c. Is there a significant difference in the correlation between self-compassion and subjective well-being for women with primary infertility in comparison to women with secondary infertility?

Thus far, published studies on self-compassion have sampled college students, whereas self-compassion studies using samples of women have been restricted to unpublished theses (Berry, 2007; Magnus, 2007). No known research investigates self-compassion in relation to women experiencing infertility, and therefore the current study proposed research questions rather than hypotheses. It is logical to examine a link between self-compassion and subjective well-being for women experiencing infertility for several reasons. First, self-compassion has been associated with the subjective well-being of college students, and thus might also be relevant to other populations. In addition, self-compassion has been presented as similar to but distinct from self-esteem, and self-esteem has been closely associated with well-being outcomes for women experiencing infertility. Prior research on the relationship between infertility and subjective well-being has been inconclusive (Anderson, Sharpe, Rattray, & Irvine, 2003; Brothers, 2000; Williams, 1997; Wischmann, Stammer, Scherg, Gerhard, & Verres, 2001) and more research is needed on how the type of infertility relates to well-being outcomes. Therefore, an exploration of self-compassion as it relates to primary and secondary infertility and well-being was expected to be fruitful.

Question 2a. For women experiencing primary infertility, does the level of self-compassion negatively correlate with infertility-related stress?

Question 2b. For women experiencing secondary infertility, does the level of self-compassion negatively correlate with infertility-related stress?

Question 2c. Is there a significant difference in the correlation between self-compassion and infertility-related stress for women with primary infertility in comparison to women with secondary infertility?

Recent research has reported that mind/body groups for infertile populations have strong potential for improving infertility adjustment (Lemmens, 2004), including lowered levels of anxiety (Chan et al., 2006). Self-compassion, with its component of mindfulness, follows from the same theoretical foundation as mind/body groups. Hence, it was important to look at the extent to which self-compassion related to infertility-related stress, and how its relationship with infertility-related stress differed depending on the type of infertility.

Question 3. Does the effect of self-compassion on subjective well-being depend on whether women are experiencing primary or secondary infertility, such that self-compassion positively relates to subjective well-being for women with primary infertility, but self-compassion fails to have a significant relationship with subjective well-being for women experiencing secondary infertility?

Question 4. Does the effect of self-compassion on infertility-related stress depend on whether women are experiencing primary or secondary infertility, such that self-compassion negatively relates to infertility-related stress for women with primary infertility, but self-compassion fails to have a significant relationship with infertility-related stress for women experiencing secondary infertility?

The dearth of research on the differential experiences of women with primary and secondary infertility made it difficult to hypothesize as to how the type of infertility might interact with self-compassion to predict subjective well-being and infertility-

related stress. However, because several studies have shown that women with primary infertility have lower levels of well-being and psychological adjustment (Epstein & Rosenberg, 2005; McQuillan et al., 2007), there is more existing evidence linking type of infertility with outcomes than there is evidence connecting self-compassion with outcomes for infertile populations. Thus, this research question attempted to further illuminate the nature of the relationships between type of infertility, self-compassion, well-being, and stress.

Question 5a. For women experiencing primary infertility, does the level of hope positively correlate with subjective well-being?

Question 5b. For women experiencing secondary infertility, does the level of hope positively correlate with subjective well-being?

Question 5c. Is there a significant difference in the correlation between hope and subjective well-being for women with primary infertility in comparison to women with secondary infertility?

Hope has been reported to be positively related to positive affect and negatively related to negative affect, with a correlation of .30 for positive affect and of -.18 for negative affect (Snyder et al., 1991). Positive emotions are thought to stem from success in individuals' pursuit of their goals, whereas negative emotions are hypothesized to arise from unsuccessful pursuit of goals (Snyder, 2002). In other words, a failure to progress in the pursuit of goals causes decreased well-being (Brunstein, 1993; Little, 1989; Synder). Others have also found support for the positive relationship between higher levels of hope and life satisfaction (Kwon, 2000; Snyder et al., 1996). Therefore, the relationship between hope and subjective well-being has been established for the college student

population, but more information was needed about these relationships among clinical populations sharing specific goals, such as women experiencing infertility.

Question 6a. For women experiencing primary infertility, does the level of hope negatively correlate with infertility-related stress?

Question 6b. For women experiencing secondary infertility, does the level of hope negatively correlate with infertility-related stress?

Question 6c. Is there a significant difference in the correlation between hope and infertility-related stress for women with primary infertility in comparison to women with secondary infertility?

Snyder (2002) posits that people high in hope will experience less stress when facing blockages in their goal-pursuit than people low in hope. This decreased stress for individuals with high hope stems from their appraisal process; high hope individuals will be able to use their thought processes to draw upon their coping skills in stressful situations. Stressors will be redefined as challenges that require alternate pathways and a redirection of agency (Snyder et al., 1991). Moreover, hope has correlated positively with emotion approach coping and correlated negatively with avoidance coping (Snyder, 2002). These research questions served to explore whether the prior findings about hope in relation to stressors applied to women experiencing infertility. Snyder has provided evidence for the role of hope for adjustment to physical illnesses, but more specific data needed to be collected to analyze hope's potential as a protective factor against stress for those with infertility.

Question 7. Does the effect of hope on subjective well-being depend on whether women are experiencing primary or secondary infertility, such that hope

positively relates to subjective well-being for women with primary infertility, but hope fails to have a significant relationship with subjective well-being for women experiencing secondary infertility?

Question 8. Does the effect of hope on infertility-related stress depend on whether women are experiencing primary or secondary infertility, such that hope negatively relates to infertility-related stress for women with primary infertility, but hope fails to have a significant relationship with infertility-related stress for women experiencing secondary infertility?

These two research questions described tentative relationships because no prior research has been conducted in this area. Little is known about the extent to which having prior children might relate to the role that hope plays in the well-being and stress of women experiencing infertility. Thus, these two research questions were exploratory in nature.

Question 9. Do the psychological variables of self-compassion and hope predict additional variance in subjective well-being beyond that predicted by the type of infertility?

Question 10. Do the psychological variables of self-compassion and hope predict additional variance in infertility-related stress beyond that predicted by the type of infertility?

The above two research questions represented a partial test of the biopsychosocial model as they examine whether psychological variables predicted significant variance beyond the biomedical variable. Both types of infertility, primary or secondary, have been associated with well-being and infertility-related stress for women (e.g., Epstein,

2005; Newton et al., 1999). Moreover, self-compassion and hope have been shown to predict a multitude of well-being outcomes in women (e.g., Diener, Suh, Lucas, & Smith, 1999; Snyder, 2002). It is possible that the psychological variables of self-compassion and hope also predicted subjective well-being and infertility-related stress, beyond the predictive contribution of women's infertility status as either having primary or secondary infertility. As indicated by initial findings, moderation and mediation analyses assessed the ways in which these variables interacted.

Question11a. What are the positive and negative aspects of women's experiences with infertility-specific online support groups?

Based on the few studies on Internet use by individuals with infertility (e.g., Malik & Coulson, 2008), online support groups are becoming more widespread as a form of social support. Yet little is known about what women with primary and secondary infertility view as the best and worst aspects of this new type of social support. More information was needed about this growing phenomenon. Open-ended questions allowed participants to share their experiences with online support groups in their own voice, thereby aiding researchers in their understanding of Internet use by women with infertility.

Question 11b. To what extent are women utilizing and relying upon infertility-specific online support groups?

Epstein et al. (2002) found that individuals whose sole source of infertility support was Internet forums were at greater risk for depression than individuals who had additional sources of social support while experiencing infertility. To replicate and extend Epstein et al.'s research question regarding the outcomes for those who rely upon internet

sources of infertility-specific support, this study used likert items in the demographic questionnaire to assess the frequency of use of online support groups, their perceived helpfulness, and to what extent participants primarily used the online support groups as their outlet for discussing infertility-related concerns. In addition, the responses of those with primary and secondary infertility were analyzed in relation to subjective well-being, which exists in contrast to depression by falling at the positive end of the continuum of health status.

Question 12: How will women respond to the following open-ended questions:

What do you believe is the cause of your infertility?

How has infertility most affected your life?

The inclusion of these open-ended questions provided rich information on the extent to which women with infertility blame themselves for their medical condition, regardless of their medically diagnosed reason for infertility. This self-blame for infertility would be expected to be related inversely to self-compassion. The second open-ended question aimed to capture more fully the experience of infertility, including whether those with primary and secondary infertility differed in how they perceive their infertility status as having affected their lives.

Chapter 4

Method

Design

To explore these research questions, a correlational field design was utilized. A sample of women who self-defined as experiencing primary and secondary infertility was obtained through online support groups for primary and secondary infertility. The status variable was the type of infertility (i.e., primary or secondary), the predictors were self-compassion and hope, and the dependent variables were subjective well-being and infertility-related stress. Open-ended questions also were used. An a priori power analysis indicated that a minimum of 89 participants were needed for a multiple regression to detect a medium effect size based on an alpha of .05 and a power of .95. Because this study involves multiple analyses, a minimum of 50 participants from each type of infertility diagnosis was sought, with the goal of having 150 total participants.

Participants

Participants were 172 women with a minimum age of 18 who self-identified as having either primary or secondary infertility. Women only were sought as participants because multiple studies have reported that women place higher importance on becoming a parent, are more active in pursuit of fertility treatment, and undergo a greater loss of self-esteem when experiencing infertility than do men (Pasch et al., 2002). Moreover, when compared with women in the general population, women but not men experiencing infertility reported a significantly lower level of well-being (van Balen & Trimbos-Kemper, 1993). As an exploration of the differential experiences of women with primary and secondary infertility, the present study defined women experiencing primary

infertility as those who have been unable to conceive after 12 months of intercourse without the use of contraception or have been unable to carry a pregnancy to full term, whereas secondary infertility is defined as the experience of being unable to achieve pregnancy or carry a pregnancy to full term after already having experienced one or more successful births. One hundred and nineteen participants who identified as having primary infertility and 53 participants who reported secondary infertility completed the survey. Forty-five individuals came to the survey website, gave consent so that they could view the survey, and then quit the survey before completing any of the measures. Data from participants missing more than 15% of items was discarded (George & Mallery, 2009). In the current study, 13 women who identified as having primary infertility and 14 women who identified as having secondary infertility failed to complete more than 15% of the survey items (16 items), totaling 27 incomplete surveys out of 199 (13.6% attrition rate). If participants' responses were missing 16 items or less, the missing values were replaced using the participants' mean score for that particular scale. A total of 35 missing values were calculated for the current sample.

The mean age of the primary infertility participants was 31.81 (*SD*=5.51) and of the secondary participants was 33.76 (*SD*=5.89). Of the entire sample, 3 participants were African American (1.74%), 7 were Asian (4.07%), 5 were Biracial (2.91%), 6 were Latino (3.49%), 2 were Native American (1.16%), 142 were White (82.56%), 3 selected "Other" (1.74%) and 4 did not specify (2.33%). Nearly half of the sample reported completing college, with nearly 20% completing high school and nearly 30% completing graduate school. Thirty-one percent of the sample reported a household income of less than $60,000 whereas 36% reported an income of $60,000-100,00 and slightly under

30% making more than $100,000. The majority of the sample (58.1%) reported full-time employment. For a more comprehensive picture of the participants' demographic information, see Table 1.

For those with primary infertility, the average number of months that they had been trying to get pregnant was 46.68 months (*SD*=38.38, range 5-240). For those with secondary infertility, the average number of months that they had been trying to get pregnant was 41.53 months (*SD*=44.02, range 6-240). Additional information about the participants' reproductive health history is presented in Table 2. For some items, participants could select more than one category, so the percentages do not sum to 100.

Table 1. Demographic Characteristics of Participants

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Race/Ethnicity	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
African American/Black	0	0%	3	5.7%	3	1.7%
Asian American/Pacific Islander/British Asian/Central Asian	3	2.5%	1	1.9%	4	2.3%
Asian Indian/Pakistani	1	0.8%	2	3.8%	3	1.7%
Biracial	4	3.4%	1	1.9%	5	2.9%
Hispanic/Latino(a)	5	4.2%	1	1.9%	6	3.5%
Native American/Native Alaskan	1	0.8%	1	1.9%	2	1.2%
White	100	84.0%	42	79.3%	142	82.6%
Other	1	0.8%	2	3.8%	3	1.7%
Not Reported	4	3.4%	0	0.0%	4	2.3%

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Country of Residence	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
USA	78	65.5%	44	83.0%	122	70.9%
Canada	27	22.7%	5	9.4%	32	18.6%
Australia	2	1.7%	1	1.9%	3	1.7%
United Kingdom	3	2.5%	2	3.8%	5	2.9%
South Africa	2	1.7%	0	0.0%	2	1.2%
France	1	0.8%	0	0.0%	1	0.6%
Romania	1	0.8%	0	0.0%	1	0.6%
New Zealand	2	1.7%	0	0.0%	2	1.2%
India	0	0.0%	1	1.9%	1	0.6%
Not Reported	3	2.5%	0	0.0%	3	1.7%

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Age	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
18-25	14	11.8%	5	9.4%	19	11.1%
26-30	41	34.5%	6	11.3%	47	27.3%
31-35	30	25.2%	23	43.4%	53	30.8%
36-40	27	22.7%	9	17.0%	36	20.9%
41-45	3	2.5%	8	15.1%	11	6.4%
46-51	1	0.8%	1	1.9%	2	1.2%
Not Reported	3	2.5%	1	1.9%	4	2.3%

Table 1. Demographic Characteristics of Participants (continued)

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Highest Level of Education Completed	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
High School	23	19.3%	10	18.9%	33	19.2%
College	58	48.7%	26	49.1%	84	48.8%
Graduate School	35	29.4%	16	30.2%	51	29.7%
Other (year 7)	0	0.0%	1	1.9%	1	0.6%
Not Reported	3	2.5%	0	0.0%	3	1.7%
	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Socioeconomic Status	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Less than 30,000	16	13.4%	6	11.3%	22	12.8%
30,000-59,999	24	20.2%	8	15.1%	32	18.6%
60,000-99,999	41	34.5%	21	39.6%	62	36.0%
100,000-149,999	25	21.0%	12	22.6%	37	21.5%
150,000 or higher	7	5.9%	6	11.3%	13	7.6%
Not Reported	6	5.0%	0	0.0%	6	3.5%
	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Sexual Orientation	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Bisexual	3	2.5%	2	3.8%	5	2.9%
Heterosexual	111	93.3%	51	96.2%	162	94.2%
Homosexual	1	0.8%	0	0.0%	1	0.6%
Not Reported	4	3.3%	1	1.9%	5	2.9%
	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Relationship Status	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Cohabitating with a Partner	6	5.0%	0	0.0%	6	3.5%
Engaged	3	2.5%	2	3.8%	5	2.9%
Married	100	84.0%	49	92.5%	149	86.6%
Remarried	2	1.7%	1	1.9%	3	1.7%
Single	2	1.7%	1	1.9%	3	1.7%
Other	2	1.7%	0	0.0%	2	1.2%
Not Reported	4	3.3%	0	0.0%	4	2.3%
	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Employment Status	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Not Employed	21	17.6%	17	32.1%	38	22.1%
Part time	7	5.9%	17	32.1%	24	14.0%
Full time	83	69.7%	17	32.1%	100	58.1%
Student	5	4.2%	2	3.8%	7	4.1%
Not Reported	3	2.5%	0	0.0%	3	1.7%

Table 2. Reproductive Medical History of Participants

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Diagnosed Cause of Infertility	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Female factor	54	45.4%	19	35.9%	73	42.4%
Male factor	9	7.6%	5	9.4%	14	8.1%
Combined Female-Male factor	17	14.3%	7	13.2%	24	14.0%
Unexplained	35	29.4%	21	39.6%	56	32.6%
Other	1	0.8%	1	1.9%	2	1.2%
Not Reported	3	2.5%	0	0.0%	3	1.7%

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Source of Infertility Diagnosis (selected all that apply)*	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Infertility Specialist	84	70.6%	34	64.2%	118	68.6%
Gynecologist/Obstetrician	43	36.1%	15	28.3%	58	33.7%
General Practitioner	8	6.7%	1	1.9%	9	5.2%
Self-Diagnosis	7	5.9%	2	3.8%	9	5.2%
Not Reported	3	2.5%	1	1.9%	4	2.3%

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
How Long Been Trying to Get Pregnant	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
0-12 months	7	5.9%	9	17.0%	16	9.3%
13 months-24 months	35	29.4%	16	30.2%	51	29.7%
25 months-36 months	24	20.2%	13	24.5%	37	21.5%
37 months-60 months	24	20.2%	5	9.4%	29	16.9%
61 months-120 months	20	16.8%	7	13.2%	27	15.7%
121 months-180 months	3	2.5%	2	3.8%	5	2.9%
20 years	1	0.8%	0	0.0%	1	0.6%
Not reported	5	4.2%	1	1.9%	6	3.5%

Table 2. Reproductive Medical History of Participants (continued)

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
Utilized Medical Treatment	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
Yes	103	86.6%	48	90.6%	151	87.8%
No	13	10.9%	5	9.4%	18	10.5%
Not Reported	3	2.5%	0	0.0%	3	1.7%

	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
What types of treatments have been pursued (selected all that applied)*	***N***	***Percentage***	***N***	***Percentage***	***N***	***Percentage***
ICI	6	5.0%	5	9.4%	11	6.4%
IVF	30	25.2%	14	26.4%	44	25.6%
Endometrial surgery	17	14.3%	1	1.9%	18	10.5%
Surgery to repair a septum	3	2.5%	1	1.9%	4	2.3%
Fibroid surgery	4	3.4%	4	7.5%	8	4.7%
Tubal surgery	7	5.9%	2	3.8%	9	5.2%
Donor eggs	2	1.7%	3	5.7%	5	2.9%
Donor sperm	4	3.4%	1	1.9%	5	2.9%
Gamete Intrafallopian Transfer (GIFT)	1	0.8%	0	0.0%	1	0.6%
ICSI	20	16.8%	7	13.2%	27	15.6%
Ovulation induction medication (e.g., FSH, Clomid, HCG)	62	52.1%	31	58.5%	93	54.1%
IUI	47	39.5%	20	37.7%	67	39.0%
Zygote intrafallopian transfer (ZIFT)	1	0.8%	1	1.9%	2	1.2%
Surrogate or gestational carrier	1	0.8%	0	0.0%	1	0.6%
Assisted hatching	5	4.2%	6	11.3%	11	6.4%
Cytoplasmic transfer	1	0.8%	0	0.0%	1	0.6%
Laparoscopy	32	26.9%	12	22.6%	44	25.6%
Immunotherapy	1	0.8%	0	0.0%	1	6.4%
Acupuncture	41	34.5%	12	22.6%	53	30.8%
Meditation	26	21.8%	10	18.9%	36	20.9%
No treatment	10	8.4%	4	7.5%	14	8.1%

For the items marked with an asterisk, participants could select more than one category, so the percentages do not sum to 100.

Measures

Demographics. A demographic questionnaire captured potentially significant within group differences on the basis of participants' backgrounds. The demographic questionnaire included items on participants' age, educational background, race, income, employment status, relationship status, and access to infertility treatment. Moreover, to address potential confounds related to fertility treatment history, the demographic questionnaire included items on the type of infertility diagnosis; the source of diagnosis (e.g., medical professional or self-diagnosis); whether participants have pursued infertility treatment and if so, what types of treatment; and history of use of biomedical technology to achieve pregnancy. The demographic questionnaire also included three items related to the use of online infertility support groups to assess frequency of use, perceived helpfulness of the online support groups, and the extent to which the online infertility support groups represent their primary outlet for discussing infertility concerns.

Self-Compassion. This study used the 26-item Self Compassion Scale (SCS; Neff, 2003) to obtain a global score of self-compassion. Although only the total score was used in this study, a brief description of each subscale is provided to show examples of items included in this measure. This measure consists of the six subscales of self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. The items from the self-kindness subscale include "I'm kind to myself when I'm experiencing suffering" and "When I'm going through a very hard time, I give myself the caring and tenderness I need." Examples of items from the common humanity scale include "When I'm down and out, I remind myself that there are lots of other

people in the world feeling like I am" and "When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people." The mindfulness scale uses items such as "When I fail at something important to me I try to keep things in perspective" and "When something painful happens I try to take a balanced view of the situation." Each item is scaled from 1 to 5, with 1 representing "almost never" and 5 indicating "almost always." Means are calculated for each subscale after calculating scoring items on self-kindness, common humanity, and mindfulness items and by reverse scoring items on the self-judgment, isolation, and over-identification subscales. The means for each subscale are then used to compute a total mean value. Only the overall score was used in the present study.

In her validation research on the Self-Compassion Scale, Neff (2003) reports strong construct, content, convergent, and discriminant validity, as well as an overall internal reliability of .92 with the following subscale reliabilities: .78 for self-kindness, .77 for self-judgment, .80 for common humanity, .79 for isolation, .75 for mindfulness, and .81 for overidentifiaction. Test-retest reliability was reported as .93 with the following subscale test-retest reliabilities: .88 for self-kindness, .88 for self-judgment, .80 for common humanity, .85 for isolation, .85 for mindfulness, and .88 for overidentification. For the present study, Cronbach alpha's for the total score was .94 for the primary infertility participants and .93 for secondary infertility participants.

The Self-Compassion Scale was normed on a college sample population (Neff, 2003), but has been used with women ages 23-28 (Berry, 2007), women ages 17-43 (Magnus, 2007), and low-income ethnic minority women (Abercrombie, Zamora, & Korn, 2007). Further, research is currently being conducted on the validity of the self-

compassion construct across Western and Eastern cultures (Neff, Pisitsungkagarn, & Hseih, 2008). Although the Self-Compassion Scale had not been used with the population of women experiencing primary and secondary infertility, its prior use with women older than 18 suggests that its validity with the infertility population deserved further exploration. Moreover, the following positive correlations between the Self Compassion Scale and other measures of well-being constructs have been found: self-esteem (.55), social connectedness (.41), and life satisfaction (.45). The negative correlations between the SCS and psychological distress include depression (-.51), anxiety (-.65), self-criticism (-.65), and neurotic perfectionism (-.57). In short, there is evidence that the Self-Compassion Scale is psychometrically sound (Neff, 2003; Shapiro, Astin, Bishop, & Cordova, 2006), and it has been shown to correlate with other constructs that have been investigated using an infertility population (Cwikel et al., 2004).

Hope. Snyder et al. (1991) created the 12 item Hope Scale to include separate subscales for agency and pathways in addition to a total Hope Scale score. Only the total score will be analyzed in this study, but examples of the subscale items offer a more complete picture of this measure. Four items measure agency, 4 items measure pathways, and 4 items serve as fillers. Example agency items are “I energetically pursue my goals” and “I meet the goals I set for myself” whereas pathway agency items include “I can think of many ways to get out of a jam” and “Even when others get discouraged, I know I can find a way to solve the problem.” Each item is rated on a 8-point likert-type scale, with responses ranging from “definitely false” to “definitely true.” The scores on the 4 filler items are discarded. Total scores can range from a low of 8 to a high of 64, and

higher scores signify higher levels of hope. When administered, the Hope Scale is labeled as “The Future Scale.”

In terms of reliability for the Hope Scale, Cronbach’s alphas ranging from .74 to .84 for the overall scale, from .63 to .80 for the pathways subscale, and from .71 to .76 for the agency subscale. In the present study, Cronbach alpha’s for the overall scale were .90 for both samples. Test-retest has been found to be a correlation of .85 after three weeks, .73 after 8 weeks, and .82 over a ten week period (Snyder et al., 1991). Exploratory factor analyses have supported the two-factor structure of Snyder’s hope theory and the amount of variance accounted for by the two factor solutions has ranged from 52% to 63% with the factor correlations ranging from .38 to .67 (Snyder et al.). Multiple confirmatory factor analyses have also offered support for the second-order model (Babyak, Snyder, & Yoshinobu, 1993; Roesch & Vaughn, 2006).

Convergent validity for the Hope Scale has been exhibited through its positive correlations with self-esteem (r=.58), optimism (r=.50), sociable coping styles (r=.43), and confident coping styles (r=.45). Discriminant validity has been demonstrated through negative correlations between scores on the Hope Scale and depression (r= -.60) as measured by the Minnesota Multiphasic Personality Inventory; scores on the Beck Hopelessness Scale (r= -.51), and avoidance coping (r= -.46) as measured by the Million Behavioral Health Inventory (Snyder et al., 1991).

Although the Hope Scale has not been used with samples of individuals experiencing infertility, it has been applied to this population using theoretical case examples (Snyder, Wrobleski, Parenteau, & Berg, 2004). Moreover, hope, as measured by the Hope Scale, has been explored directly in individuals dealing with chronic

physical illnesses, severe injuries, and disabilities, including women ranging in age from 18 to 80. It has been found that high hope has positive implications for primary prevention (e.g., using information to improve physical health outcomes) as well as secondary prevention (e.g., coping once an illness has occurred) of illness (Snyder, Rand, & Sigmon, 2005). Prior studies on physical health using the Hope Scale suggested the relevance of using the Hope Scale for women experiencing infertility.

Outcome Variables

Life Satisfaction. Subjective well-being has been defined as a general area of study, rather than one construct, that consists of people's overall satisfaction with life, their emotional states, and their domain-specific satisfactions (Diener et al., 1999). The Satisfaction with Life Scale (SWLS; Diener et al., 1985) has been established as a reliable and valid cognitive-based measure of global life satisfaction (Pavot & Diener, 1993), and was used in this study. The SWLS contains five items to be answered on a seven-point scale ranging from strongly disagree (1) to strongly agree (7), with a total score of 5 indicating minimal life satisfaction and a total score of 35 indicating highest possible life satisfaction. Example items are "If I could live my life over, I would change almost nothing" and "I am satisfied with my life." In their review of the uses of the SWLS, Pavot and Diener reported that the Scale demonstrated strong convergent and discriminant validity. It was found to correlate negatively with measures of distress, such as the Beck Depression Inventory (Blais, Vallerand, Pelletier, & Briere, 1989) and several factor analytic studies have supported its one-dimensional structure (Arrindell, Meeuwesen, & Huyse, 1991; Blais et al; Pavot, Diener, Colvin, & Sandvik, 1991). The temporal stability of the SWLS has been supported by findings of a 0.82 test-retest

stability coefficient and it has also been shown to have an internal consistency coefficient of 0.87 (Pavot & Diener). In the current study, SWLS had a Cronbach alpha of .87 for the primary infertility sample and a Cronbach alpha of .85 for the secondary infertility sample. Additionally, the SWLS has been used with women to assess their experiences 2 to 3 years after infertility treatments (Hammarberg, Astbury, & Baker, 2001), and life satisfaction has been deemed an important area of exploration for individuals experiencing infertility (McQuillan et al., 2007).

Positive and Negative Affect. The present study utilized the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) to assess the emotional component of subjective well-being, including scale scores for both positive affect (PA) and negative affect (NA). The PANAS contains the ten positive and ten negative emotions, respectively, as follows: interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, active, distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, and afraid. Users rated the intensity of each emotion for the past week on a scale of 1 to 5, with 1 representing “very slightly or not at all” and 5 representing “extremely.”

The PANAS has been shown to have high reliability and validity (Crawford & Henry, 2004) and to be stable over a two month period (Watson et al., 1988). More specifically, confirmatory factor analysis supported its construct validity and revealed that the NA and the PA scales assess two distinct but moderately negatively correlated factors (Crawford & Henry, 2004). Internal consistencies were found to be 0.89 for the PA scale and 0.85 for the NA scale (Crawford & Henry, 2004). In addition to having been used with a wide range of healthy and clinical populations, the PANAS also has

been used with women undergoing in vitro fertilization (Durning & Williams, 2004). Another study using the PANAS with women after they received IVF reported an internal consistency coefficient of .81 for the NA scale and an internal consistency coefficient of .87 for the PA scale (Panagopoulou, Vedhara, Gaintarzti, & Tarlatzis, 2006). In the current study, the PA scale was found to have an internal reliability of .89 for women with primary infertility and of .84 for women with secondary infertility. The NA scale was found to have a Cronbach alpha of .84 for women with primary infertility and of .91 for women with secondary infertility.

Infertility-Related Stress. To measure infertility-related stress, the present study used The Fertility Problem Inventory (FPI), which was created to capture perceived stress specific to populations experiencing infertility (Newton et al., 1999). The FPI includes 46-items that provide a composite score summed by adding scores for five scales measuring social concern, sexual concern, relationship concern, rejection of childfree lifestyle, and the need for parenthood. Items are rated on a 6 point Likert scale, with 1 equaling "strongly disagree" and 6 representing "strongly agree." Nineteen of the items are reversed-scored, with possible scores ranging from 46 to 276. Example items include "I can't help comparing myself with friends who have children" (social concern); "During sex, all I can think about is wanting a child/another child" (sexual concern); "Because of infertility, I worry that my partner and I are drifting apart" (relationship concern); "Having a child/another child is not necessary for my happiness" (rejection of childfree lifestyle); and "I will do just about anything to have a child/another child" (need for parenthood). The FPI used a large infertility population (N= 2302) seeking treatment in its norming, finding that women's mean score was 134.4 (*SD*=33.8). A high global

score indicates a high level of infertility-related stress compared to other same-sex individuals experiencing infertility. In the current study, the mean score for the women with primary was 178.4 (*SD*=33.3) and for the women with secondary infertility was 178.7 (*SD*=32.0).

In the only study on the FPI's validity and reliability, Newton et al. reported discriminant validity intercorrelations for the five subscales of the FPI as ranging from 0.26 to 0.66, but failed to report discriminant validity for the global score. An examination of its convergent validity found that a higher global stress score correlated with higher scores for depression (0.40 to 0.60) and anxiety (0.37 to 0.41) as well as with lower levels of marital adjustment (-0.23 and -0.40). Test-retest reliability for global stress for women was reported as 0.83, and internal consistency coefficients ranged from 0.77 to 0.93. For this study's sample, the FPI had a Cronbach alpha of .92 for women with primary infertility and of .91 for women with secondary infertility. Moreover, the FPI is sensitive to differences in gender and fertility history. Consistent with prior infertility research, women completing the FPI reported significantly higher scores on global stress, social concern, sexual concern, and the need for parenthood. Furthermore, those experiencing secondary infertility scored lower on global stress, social concern, and sexual concern but higher on rejection of childfree lifestyle. The higher scores on the rejection of childfree lifestyle scale for people experiencing secondary infertility may have been impacted by the norming of this scale on those actively seeking treatment (Newton et al.).

Internet Social Support. Two open-ended questions were included to capture the best and worst aspects of participants' use of fertility-specific online support groups

to connect with others as a means of coping. The questions were as follows: (1) What is the best thing about using an online infertility support group and (2) What is the worst thing about using an online infertility support group? In addition, three likert items related to online social support were included in the demographic questionnaire. These questions asked about the frequency of use of online support groups, their perceived helpfulness, and to what extent participants primarily use the online support groups as their outlet for discussing infertility-related concerns.

Procedure

Despite the greater prevalence of secondary infertility in the United States, these women are less likely to seek treatment than women with primary infertility. As a means of reaching participants with secondary as well as primary infertility who were not currently seeking medical treatment as well as those who were seeking medical treatment, this study relied on participant recruitment through an online source. Recent research on infertility has established that over half of patients seeking medical treatment for their infertility are using the Internet as a source of information and support (Kahlor & Mackert, 2009; Rawal & Haddad, 2006), with some relying on the Internet as their sole source of support (Epstein, Rosenberg, Grant, & Hemenway, 2002).

This study's use of online recruitment was limited to online support groups for primary and secondary infertility. For the first month of the study, only the Daily Strength online support groups for primary and secondary infertility (http://dailystrength.org/c/Infertility/support-group and http://dailystrength.org/c/Secondary-Infertility/support-group) included an announcement calling for participants. On the date on which the survey announcement was first posted,

the Daily Strength Infertility support group listed 4002 members and the Secondary Infertility support group consisted of 251 members. However, it was not possible to track how often each member visited the website nor was it possible to calculate how many times the survey announcement was viewed. During the second month of the study, recruitment announcements were posted on the other online support group websites found in Appendix A. Additionally, two months later a recruitment reminder was posted on the three Daily Strength support groups and a final survey notice was posted notifying potential participants that the survey was closing on May 31, 2009.

The cumulative survey for this study consisted of 135 items and four open-ended questions. Only composite scores for the global scale of each of the five measures were analyzed. Two open-ended questions were utilized to assess social support obtained through the use of infertility-specific online support groups and two open-ended questions were presented to capture general aspects of women's experiences with infertility. The announcement for the study described the purpose and importance of the study, and stated that viewers of the survey announcement were eligible to participate if they were women over the age of 18 who have been unable to become pregnant after 12 months of unprotected intercourse or have been unable to carry a pregnancy to full term. Further, this announcement provided a direct link to the survey's web address, which was hosted by PsychData (https://psychdata.com), at which participants accessed the demographic questionnaire, the Self-Compassion Scale (Neff, 2003), the Hope Scale (Synder et al., 1991), the Satisfaction with Life Scale (Diener et al., 1985), the Positive and Negative Affect Schedule (Watson et al., 1988), the Fertility Problem Inventory (Newton et al., 1999), and the open-ended questions. For the secondary infertility

participants, the Satisfaction with Life Scale (Diener et al.) preceded the Hope Scale (Synder et al.), but otherwise the measures were not counterbalanced. The survey took approximately 30 minutes to complete. Once participants submitted the completed survey, they were directed to a final page that explained the purpose of the study in greater detail and offered information on the primary researcher as well as referral sources. Finally, as an incentive for participation, respondents could choose to enter their email address to be entered into a drawing for a $100 gift certificate to www.amazon.com. The winner of the gift certificate was sent the gift, delivered through email, on June 1. The participants' email addresses were not connected to their survey responses in any way. The participants were assured of the protection of their confidentiality throughout each step of the study's procedures.

Chapter 5

Results

The results chapter includes preliminary analyses, sample description of demographics and medical history, analysis of the two hypotheses and twelve research questions, and additional analyses.

Preliminary Analyses

The analyses were completed using the statistical package software SPSS Version 15. The analyzed variables were screened for missing values, and 21 missing values were found in the Fertility Problem Inventory, 6 missing values were found in the Positive and Negative Affect Schedule, 7 missing values were found in the Self-Compassion Scale, 1 missing value was found in the Hope Scale, and 1 missing value was found in the Satisfaction with Life Scale, totaling 35 missing values. These missing values were replaced using the participant's mean score for that particular scale. Data from the 27 participants missing more than 16 items (15%) was discarded (George & Mallery, 2009). The normality of each variable was checked and the scales were assessed for internal consistency. All values for tests for skewness and kurtosis were lower than one, indicating that the variables were close to normally distributed. The open-ended questions were scored by 3 coders, who reached an acceptable reliability level ranging from a cohen's kappa of .728 to .825. The coders reached consensus on the additional responses through discussion.

Sample Description of Demographics and Medical Background

Descriptive data about the demographic and reproductive background of participants was presented in Tables 1 and 2. The sample of this study was primarily

heterosexual (94.2%) married (86.6%), White (82.6%), highly educated (48.8% college degree and 29.7% graduate degree) women. Among the current study's sample of women with primary infertility, more than half (65.5%) were from the United States but nearly 23% were Canadian. In contrast, among participants with secondary infertility, 83% represented the United States and only 9.4% represented Canada. Due to the online nature of data collection, four participants from countries as far away as South Africa and New Zealand completed the survey. In regards to socioeconomic background, the majority of participants rated themselves as middle class (54.6%). All income brackets were represented, including both the lowest (12.8% reporting an income of 30,000 or less) and the highest (7.6% reporting an income of greater than 150,000).

The overall average age of survey participants was just under 31 years old, with largest group of women with primary infertility reporting an age range of 26-30 (34.5% of the sample) and 54% reporting an age of over 30 years old. The largest group of women with secondary infertility reported an age of 31-35 (43.4%) and 79.3% reported an age of over 30 years old. In other words, the primary infertility sample had a more even spread amongst the various age groups, in comparison to the secondary infertility sample that had significantly more participants in the upper age groups (i.e., the age range of 31-45 years of age). This variation in the participant age range for the two groups is logical considering that those with secondary infertility have already had a successful conception and thus, are more likely to be older than those with primary infertility.

Due to the complexity of medical and physiological variables involved in infertility, a review of the participants' medical history was warranted to ensure that it did

not affect significantly outcomes on the independent and dependent variables. Approximately 1/3 of infertility cases are due to male factors, 1/3 are due to female factors, and for the remaining 1/3 infertility is caused by either a combined female-male factor or is unexplained (American Society for Reproductive Medicine, 2009). In the current sample, 8.1% reported male factor infertility, 14.0% reported female-male factor, 42.4% reported female-factor, and over 30% reported an unexplained cause of infertility. The length of time spent by participants trying to get pregnant had great variability, ranging from less than one year to 20 years. The majority of responding participants reported having spent between 1-3 years trying to get pregnant (50.2%). Neither the length of attempted pregnancy nor the use of medical treatment related to the independent and dependent variables in this study.

Of note are the most commonly used infertility treatments by this sample. One of the least invasive treatments, medication to induce ovulation, was the most common (54.1%) reported treatment, with intrauterine insemination (IUI; i.e., placement of sperm directly in the uterus) as the second most common treatment (39%) reported. Laparoscopy and in vitro fertilization represent the third most commonly reported treatments (25.6%). Laparoscopy is a procedure used to surgically remove uterine lining tissue in areas outside the uterus as a method of treating endometriosis and improving fertility by restoring the anatomic connection between the ovaries and fallopian tubes. In vitro fertilization is a type of assisted reproductive technology that involves fertilizing an egg outside the uterus, allowing the fertilized egg to divide into embryos, and then transferring and implanting the embryo(s) into the uterus. Although both laparoscopy and IVF are typically outpatient procedures, they can be invasive procedures. As alternative

treatments, acupuncture (30.8%) and meditation (20.9%) were also reported by the current sample. In short, the sample reported using a wide range of infertility treatments that include both invasive medical procedures and noninvasive home therapies.

For the primary infertility sample, the means, standard deviation, and internal consistency values for the measures is presented in Table 3. The same information for the secondary infertility sample can be found in Table 4. All measures had adequate levels of internal consistency (α>.83).

When comparing these score on the independent and dependent variables to the general infertility population as reported in previous research, the current sample was found to report higher levels of infertility-related stress and lower levels of well-being. More specifically, the sample reported greater mean scores of infertility-related stress, less life satisfaction, less positive affect, and greater negative affect than other infertility studies, as revealed when comparing the mean scores of the sample of women with primary and secondary infertility with the scores given for these measures in other studies on infertility (Durning & Williams, 2004; Hammarberg, Astbury, & Baker, 2001).

The Fertility Problem Inventory (FPI; Newton et al., 1999) used a large infertility population (N= 2302) seeking medical treatment in its norming, finding that women's mean score was 134.4 (*SD*=33.8). In the current study, the mean score for the women with primary infertility was 178.4 (*SD*=33.3) and for the women with secondary infertility it was 178.7 (*SD*=32.0). Analyzing the current study's sample of women with primary infertility separate from the sample of women with secondary infertility, significant differences were found between the mean scores for these two samples of women and the mean scores of the sample on which the Fertility Problem Inventory was

normed. More specifically, for women with primary infertility compared to the sample of primary infertility on which the measure was normed, t_{117}= 13.9, p<0.01. For women with secondary infertility compared to the normed sample of women with secondary infertility, t_{51}= 9.4, p<0.01. Higher global score on the FPI indicates a higher level of infertility-related stress compared to other same-sex individuals experiencing infertility, and therefore, the current sample was reporting significantly more stress than the norm group. Further, scores on measures of life satisfaction (M=19.3 for primary infertility and M=20.5 for secondary infertility) and on measures of positive affect (M=25.6 for primary infertility and 27.6 for secondary infertility) were significantly lower (t_{117}= 6.5, , p<0.01; t_{51}= 4.3, p<0.01) than those scores on the same measures reported by the current sample's women with primary and secondary infertility. Additionally, scores on negative affect (M=29.9 for primary infertility and M=31.2 for secondary infertility) were significantly higher for the current sample (t_{117}= 7.5, p<0.01; t_{51}= 6.7, p<0.01) than that reported in other studies on women with infertility (Hammarberg, Astbury, & Baker, 2001; Durning & Williams, 2004). Although the self-compassion scale and trait hope scale had not been utilized previously with women with infertility, the norming of these measures on college students indicated higher average scores than that found with the current sample (Neff, 2003; Snyder, Harris, et al., 1991). Female college students reported significantly higher levels of hope (Synder, Harris, et al., 1991) than the current sample of women with primary infertility (t_{117}= 5.2, , p<0.01) and with secondary infertility (t_{51}= 4.5, p<0.01). Women between the ages of 17 and 43 reported greater levels of self-compassion (Magnus, 2007) than that reported by the current sample of women with primary infertility (t_{117}= 4.5, , p<0.01) and with secondary infertility (t_{51}=

3.9, $p<0.01$). In short, the women who comprise the sample are reporting greater levels of infertility-related stress and lower levels of well-being than previously found in women with infertility.

In summary, the samples for the current study represent women with infertility who are primarily White, married, heterosexual, and highly educated. They have been attempting to become pregnant from anywhere between one to 20 years, with the majority having spent the past 1-3 years attempting to become pregnant. They have utilized a wide range of infertility treatment options, including medical and non-medical procedures. Finally, they report experiencing significant distress and decreased well-being.

Table 3: Means, Standard Deviations, and Internal Consistencies for Measures Used with Primary Infertility Sample

Measure	*Possible Range*	*Sample Range*	*Scoring*	*Mean*	*SD*	*Alpha*
Self-Compassion Scale (SCS)	1.00-5.00	1.04-5.00	Likert range 1-5 (higher= higher self-compassion) [1]	2.69	0.70	0.94
Trait Hope Scale	8-64	11-64	Likert range 1-8 (higher= greater levels of hope)	45.93	10.40	0.90
Satisfaction with Life Scale	5-35	5-34	Likert range 1-7 (higher=greater life satisfaction)	19.30	7.43	0.87
Positive and Negative Affect Schedule (PANAS): Positive Affect	10-50	10-48	Likert range 1-5 (higher= more intense emotion)	25.95	8.76	0.89
Positive and Negative Affect Schedule (PANAS): Negative Affect	10-50	13-50	Likert range 1-5 (higher= more intense emotion)	29.90	8.73	0.84
Fertility Problem Inventory (FPI)	46-276	82-267	Likert range 1-6 (higher=greater fertility-related stress)	178.36	33.32	0.92

[1] The Self-Compassion Scale was scored by calculating the average score for each of the six subscales, and then calculating a global average score across the subscales.

Table 4: Means, Standard Deviations, and Internal Consistencies for Measures Used with Secondary Infertility Sample

Measure	*Possible Range*	*Sample Range*	*Scoring*	*Mean*	*SD*	*Alpha*
Self-Compassion Scale (SCS)	1.00-5.00	1.38-3.98	Likert range 1-5 (higher= higher self-compassion) [2]	2.67	0.24	0.93
Trait Hope Scale	8-64	13-60	Likert range 1-8 (higher= greater levels of hope)	45.84	10.44	0.90
Satisfaction with Life Scale	5-35	5-35	Likert range 1-7 (higher=greater life satisfaction)	20.49	6.95	0.85
Positive and Negative Affect Schedule (PANAS): Positive Affect	10-50	12-46	Likert range 1-5 (higher= more intense emotion)	27.62	7.83	0.84
Positive and Negative Affect Schedule (PANAS): Negative Affect	10-50	10-50	Likert range 1-5 (higher= more intense emotion)	31.16	10.28	0.91
Fertility Problem Inventory (FPI)	46-276	123-261	Likert range 1-6 (higher=greater fertility-related stress)	178.68	31.97	0.91

[2] The Self-Compassion Scale was scored by calculating the average score for each of the six subscales, and then calculating a global average score across the subscales.

Preliminary Correlations

A correlation matrix of Pearson's r correlation coefficients and Spearman's rho correlation coefficients was created to capture information about the relationships among all dichotomous, ordinal, and interval variables, including the demographic variables such as length of time they had tried to get pregnant, age, educational background, and whether participants had ever been pregnant. Spearman rho's were calculated to express the relation between interval and ordinal variables, whereas Pearson's r correlation coefficients were calculated to express the relation between dichotomous and interval variables. Due to the large number of correlations run, a more strict alpha value (p <.01) was used to control for family-wise error. This information can be found in Figures 1 and 2. For women with primary infertility, correlations between socioeconomic status and hope (ρ=0.29, small effect) and between full-time employment and hope (r= -0.24, small effect) were significant at the p<.01 level, such that higher incomes and full-time employment were related to higher levels of hope for women with primary infertility. Further, socioeconomic status was correlated positively with life satisfaction (ρ=0.31, medium effect) and subjective well-being (ρ=0.25, small effect) but correlated negatively with fertility-related stress (ρ= -0.30, medium effect) for women with primary infertility. However, these relationships differed for women with secondary infertility; negative affect and fertility-related stress were correlated significantly with the demographic variables of age (respectively, r= -0.54, r= -0.44, medium-large effects) and number of years in their current relationship (r= -0.38, r= - 0.31, medium effects). When the correlations were run on the total sample, age continued to have a significant relation with negative affect (r= -0.21, small effect) and fertility-related stress (r= -0.23, small

effect) and relationship length had a significant correlation with negative affect (r= -0.25, small effect). Perhaps most notably, socioeconomic status correlated positively with hope (ρ=0.24, small effect) and life satisfaction (ρ=0.22) and negatively correlated with fertility-related stress (ρ= -0.27, small effect). Socioeconomic status, age, and relationship length were controlled to ensure that the effects of these demographic variables were accounted for in the regression analyses. To assess the relationship between the multi-level nominal demographic variables of race and country of origin (e.g., U.S., Canada, England) and the reproductive history variable of diagnosed cause of infertility (e.g., female factor, male factor, combined factor) with the predictor and outcome variables, one-way ANOVAs were run using an alpha of 0.01, finding no significant differences. Further analyses were computed to assess each of the research hypotheses and research questions.

Figure 1: Bivariate Correlations for Primary Infertility Sample

	SCS	HOPE	SWLS	PosAff	NegAf	SWB	FPI	Age	Rel	Educ	SES	Emp	Med	Time	Preg
SCS	1.00														
HOPE	.63**	1.00													
SWLS	.55**	.59**	1.00												
PosAf	.48**	.41**	.30**	1.00											
NegAf	-.54**	-.35**	-.34**	-.30**	1.00										
SWB	.71**	.61**	.75**	.74**	-.73**	1.00									
FPI	-.59**	-.51**	-.61**	-.39**	.53**	-.69**	1.00								
Age	-.01	.04	.04	-.12	-.05	-.02	-.15	1.00							
Rel	.02	-.20*	-.13	-.09	-.20*	-.02	-.11	.25**	1.00						
Educ	.02	.21*	.15	-.03	-.08	.10	-.06	.30**	.04	1.00					
SES	.17	.29**	.31**	.01	-.20*	.25**	-.30**	.39**	.05	.28**	1.00				
Emp	-.10	-.24**	-.03	.07	.13	.04	.01	.09	-.13	-.03	-.32**	1.00			
Med	.14	-.03	.01	-.12	.08	-.09	.08	.10	.05	.02	-.31**	.12	1.00		
Time	-.02	-.14	-.11	-.23*	-.10	-.11	.10	.27**	.38**	.04	-.03	.05	.02	1.00	
Preg	-.01	.04	.11	.22*	-.02	-.16	-.07	-.19*	-.02	-.03	.01	-.02	-.26**	-.03	1.00

Key to Abbreviations in Figure 1: SCS (Self-Compassion Scale); HOPE (Hope Scale); SWLS (Satisfaction with Life Scale); PosAff (Positive Affect subscale of Positive and Negative Affect Schedule; PANAS); NegAf (Negative Affect subscale of Positive and Negative Affect Schedule; PANAS); FPI (Fertility Problem Inventory); Age (Current Age); Rel (Number of Years in Current Relationship); Educ (Highest Level of Education Achieved); SES (Socioeconomic Status); Emp (Employment, 1 is Full-Time, 2 is Not Full-Time); Med (Medical Treatment for Infertility, 1 is yes, 2 is no); Time (Number of Months Trying to Get Pregnant); Preg (Ever Been Pregnant, 1 is yes, 2 is no). Correlations significant at $p<.01$ are marked with an "**" and correlations significant at $p<.05$ are marked with an "*." Correlations that are underlined indicate Spearman's rho values.

Figure 2: Bivariate Correlations for Secondary Infertility Sample

	SCS	HOPE	SWLS	PosAff	NegAf	SWB	FPI	Age	Rel	Educ	SES	Emp	Med	Time	Preg
SCS	1.00														
HOPE	.36**	1.00													
SWLS	.32*	.56**	1.00												
PosAff	.37**	.43**	.30*	1.00											
NegAf	-.55**	-.21	-.27	-.23	1.00										
SWB	.59**	.55**	.72**	.68**	-.74**	1.00									
FPI	-.43**	-.18	-.32*	-.10	.67**	.53**	1.00								
Age	.14	.05	-.01	.04	-.54**	-.27	-.44**	1.00							
Rel	-.02	-.02	-.06	.08	-.38**	.18	-.31**	.48**	1.00						
Educ	.14	.20	.13	.13	-.18	.23	-.16	.2	.14	1.00					
SES	-.03	.12	-.01	.10	-.06	.25	-.21	.27	.25	.21	1.00				
Emp	.06	-.03	.24	.08	-.05	-.16	-.17	.11	.04	-.15	-.30	1.00			
Med	-.10	-.02	.06	.06	.16	-.02	.24	-.17	-.16	.02	-.11	.01	1.00		
Time	.09	-.09	-.06	.16	-.27	.17	-.18	.40**	.70**	-.11	-.14	.24	-.06	1.00	
Preg	-.04	-.06	.02	.00	-.09	-.03	-.03	-.07	-.11	.14	.22	.01	.40**	-.04	1.00

Key to Abbreviations in Figure 2: SCS (Self-Compassion Scale); HOPE (Hope Scale); SWLS (Satisfaction with Life Scale); PosAff (Positive Affect subscale of Positive and Negative Affect Schedule; PANAS); NegAf (Negative Affect subscale of Positive and Negative Affect Schedule; PANAS); FPI (Fertility Problem Inventory); Age (Current Age); Rel (Number of Years in Current Relationship); Educ (Highest Level of Education Achieved); SES (Socioeconomic Status); Emp (Employment, 1 is Full-Time, 2 is Not Full-Time); Med (Medical Treatment for Infertility, 1 is yes, 2 is no); Time (Number of Months Trying to Get Pregnant); Preg (Ever Been Pregnant, 1 is yes, 2 is no). Correlations significant at $p<.01$ are marked with an "**" and correlations significant at $p<.05$ are marked with an "*." Correlations that are underlined indicate Spearman's rho values.

Figure 3: Bivariate Correlations for Total Sample

	SCS	HOPE	SWLS	PosAff	NegAf	SWB	FPI	Age	Rel	Educ	SES	Emp	Med	Time	Preg
SCS	1.00														
HOPE	.55**	1.00													
SWLS	.49**	.58**	1.00												
PosAff	.45**	.41**	.31**	1.00											
NegAf	-.54**	-.30**	-.31**	-.27**	1.00										
SWB	.68**	.59**	.74**	.72**	-.72**	1.00									
FPI	-.55**	-.41**	-.52**	-.30**	.57**	-.64**	1.00								
Age	.03	.04	.04	-.06	-.21**	.09	-.23**	1.00							
Rel	.00	-.12	-.09	-.02	-.25**	.07	-.11	.36**	1.00						
Educ	.06	.20**	.14	.01	-.12	.14	-.08	.27**	.07	1.00					
SES	.10	.24**	.22**	.05	-.15	.19*	-.27**	.36**	.13	.27**	1.00				
Emp	.05	.18*	-.04	-.10	-.09	-.03	.03	.13	.01	.06	.28**	1.00			
Med	-.02	-.04	.01	-.09	.08	-.08	.05	.04	-.01	.05	-.16**	.28**	1.00		
Time	-.05	-.12	-.10	-.09	.08	-.02	.00	.30**	.48**	-.01	-.07	.01	.00	1.00	
Preg	-.01	.03	.05	.12	-.02	.08	-.06	-.22**	-.11	.02	.00	.14	-.02	.00	1.00

Key to Abbreviations in Figure 2: SCS (Self-Compassion Scale); HOPE (Hope Scale); SWLS (Satisfaction with Life Scale); PosAff (Positive Affect subscale of Positive and Negative Affect Schedule; PANAS); NegAf (Negative Affect subscale of Positive and Negative Affect Schedule; PANAS); FPI (Fertility Problem Inventory); Age (Current Age); Rel (Number of Years in Current Relationship); Educ (Highest Level of Education Achieved); SES (Socioeconomic Status); Emp (Employment, 1 is Full-Time, 2 is Not Full-Time); Med (Medical Treatment for Infertility, 1 is yes, 2 is no); Time (Number of Months Trying to Get Pregnant); Preg (Ever Been Pregnant, 1 is yes, 2 is no). Correlations significant at $p<.01$ are marked with an "**" and correlations significant at $p<.05$ are marked with an "*." Correlations that are underlined indicate Spearman's rho values.

Analysis of Hypotheses and Research Questions

Hypothesis 1: Women with primary infertility will have lower levels of subjective well-being than women with secondary infertility.

A two sample t-test for independent groups was conducted comparing type of infertility and life satisfaction, as well as a two sample t-test for independent groups comparing type of infertility and positive and negative affect. This hypothesis was not supported by the data. For positive affect, t_{170}= -1.21, p>0.05 whereas for negative affect, t_{170}= -0.81, p>0.05. Insignificant differences were also found for life satisfaction (t_{170}= -1.04, p>0.05). To assess subjective well-being as a global construct consisting of the cognitive dimension of life satisfaction and the affective dimensions of positive and negative affect, standardized scores on the life satisfaction measure were added to positive affect standardized scores, from which standardized negative affect scores were subtracted (e.g., Haslam, Whelan, & Bastian, 2009). An additional t-test failed to find significant differences in global subjective well-being (t_{170}= -0.66, p>0.05) depending upon infertility type.

Hypothesis 2: Women with primary infertility will have higher levels of infertility-related stress than women with secondary infertility.

A two sample-t test for independent groups was conducted using type of infertility as the status variable and infertility stress as the outcome variable, finding no significant differences in the infertility-stress levels of the two groups (t_{170}= -0.19, p>0.05).

Question 1a. For women experiencing primary infertility, does the level of self-compassion positively correlate with subjective well-being?

For women reporting primary infertility, self-compassion was correlated positively with positive affect (r=0.48, p<0.01, medium effect size) and life satisfaction (r=0.55, p<0.01, large effect size) and was correlated negatively with negative affect (r= -0.54, p<0.01, large effect size). For the global construct of subjective well-being, self-compassion had a large effect size (r=0.71, p<0.01).

Question 1b. For women experiencing secondary infertility, does the level of self-compassion positively correlate with subjective well-being?

For women reporting secondary infertility, self-compassion was correlated positively with positive affect (r=0.37, p<0.01, medium effect size), but only found to have a positive significant relationship with life satisfaction at the alpha level of 0.05 (r=0.32, p<0.05). Self-compassion had a significant negative relationship with negative affect (r= -0.55, p<0.01), a large effect size (Cohen, 1992). Additionally, its relation with the global construct of subjective well-being was a large effect size (r=0.59, p<0.01).

Question 1c. Is there a significant difference in the correlation between self-compassion and subjective well-being for women with primary infertility in comparison to women with secondary infertility?

Using a two-tailed Fisher Z test for differences in correlation, no significant differences were found in the relationship between self-compassion and subjective well-being for women with primary infertility compared to women with secondary infertility. For positive affect, z=0.80 (p>0.05) and for negative affect, z=0.08 (p>0.05). Differences in the relationship between self-compassion and life satisfaction equaled z of 1.69 (p>0.05). Finally, differences in the relationship between self-compassion and the global construct of subjective well-being was not significant (z=1.24, p>0.05).

Question 2a. For women experiencing primary infertility, does the level of self-compassion negatively correlate with infertility-related stress?

For women with primary infertility, self-compassion was found to have a negative relationship with infertility-related stress, such that higher levels of self-compassion on SCS (Neff, 2003) related to lower levels of reported stress ($r= -0.59$, $p<.01$, a large effect size) as measured by overall FPI scores (Newton, Sherrard, & Glavac, 1999).

Question 2b. For women experiencing secondary infertility, does the level of self-compassion negatively correlate with infertility-related stress?

This research question also was answered affirmatively by the data. The pearson's *r* correlation of SCS scores (Neff, 2003) with overall FPI scores (Newton, Sherrard, & Glavac, 1999) was -0.43 ($p<.01$), a medium effect for women with secondary infertility.

Question 2c. Is there a significant difference in the correlation between self-compassion and infertility-related stress for women with primary infertility in comparison to women with secondary infertility?

Using a two-tailed Fisher Z test for differences in correlation, no significant differences were found in the relationship between self-compassion and infertility related stress for women with primary infertility compared to women with secondary infertility ($z= 1.29$, $p>0.05$).

Question 3. Does the effect of self-compassion on subjective well-being depend on whether women are experiencing primary or secondary infertility, such that self-compassion positively relates to subjective well-being for women with primary infertility, but self-compassion fails to have a significant relationship with subjective well-being for women experiencing secondary infertility?

Hierarchical regression analyses were run to assess life satisfaction, positive affect, negative affect, and subjective well-being as the criterion variables after controlling for the demographic variables of socioeconomic status, age, and length of relationship; self-compassion as the predictor variable; and the type of infertility added as a third step. The interaction between self-compassion and infertility type was added last. The type of infertility failed to moderate the relationship between self-compassion and life satisfaction ($\Delta F_{3,156}$=1.24, ΔR^2 =0.005, p>0.05), self-compassion and positive affect ($\Delta F_{3,156}$=0.33, ΔR^2 =0.002, p>0.05), self-compassion and negative affect ($\Delta F_{3,156}$=1.75, $\Delta R^2_{3,156}$=0.007, p>0.05), and self-compassion and subjective well-being ($\Delta F_{3,156}$=0.61, $\Delta R^2_{3,156}$=0.00, p>0.05)

Question 4. Does the effect of self-compassion on infertility-related stress depend on whether women are experiencing primary or secondary infertility, such that self-compassion negatively relates to infertility-related stress for women with primary infertility, but self-compassion fails to have a significant relationship with infertility-related stress for women experiencing secondary infertility?

A hierarchical regression analysis was run (see table 9) using infertility-related stress as the criterion variable, self-compassion as the predictor variable, and the type of infertility as the moderating variable. Once again, the demographic variables of socioeconomic status, age, and length of relationship were entered as the first step, then self-compassion as the second step, the type of infertility as the third step, and the interaction between self-compassion and infertility as the fourth step. The interaction between self-compassion and infertility type failed to be significant ($\Delta F_{3,156}$=0.56, $\Delta R^2_{3,156}$=0.002, p>0.05). In summary, the type of infertility failed to moderate the

relationship between self-compassion with subjective well-being and infertility-related stress.

Question 5a. For women experiencing primary infertility, does the level of hope positively correlate with subjective well-being?

Pearson r correlation coefficients were calculated to determine the relationship between scores on the Hope Scale (Synder et al., 1991) and scores on the SWLS (Diener, Emmons, Larsen, & Griffin, 1985) and the PANAS (Watson, Clark, & Tellegen, 1988) for women with primary infertility. Hope was positively correlated with life satisfaction (r=0.59, p<0.01), a large effect size, and positive affect (r=0.41, p<0.01), a medium effect size, and negatively correlated with negative affect (r= -0.35, p<0.01), a medium effect size, for women with primary infertility. A large effect size was found for the relation between hope and global subjective well-being (r=0.61, p<0.01).

Question 5b. For women experiencing secondary infertility, does the level of hope positively correlate with subjective well-being?

Pearson *r* correlation coefficients were calculated to determine the relationship between scores on the Hope Scale (Synder et al., 1991) and scores on the SWLS (Diener, Emmons, Larsen, & Griffin, 1985) and the PANAS (Watson, Clark, & Tellegen, 1988) for women with secondary infertility. Hope was positively correlated with life satisfaction (r=0.56, p<0.01), a large effect size, and positive affect (r=0.43, p<0.01), a medium effect size, but the correlation between hope and negative affect (r= -0.21, p>0.05) failed to reach significance for women with secondary infertility. However, hope positively correlated with global subjective well-being (r=0.55, p<0.01, large effect size).

Question 5c. Is there a significant difference in the correlation between hope and subjective well-being for women with primary infertility in comparison to women with secondary infertility?

Utilizing a Fisher Z test for differences in correlation, no significant differences were found between hope and life satisfaction (z=0.27, p>0.05), between hope and positive affect (z= -0.14, p>0.05), between hope and negative affect (z= -0.9, p>0.05), and between hope and global subjective well-being (z=0.54, p>0.05) when comparing women with primary and secondary infertility.

Question 6a. For women experiencing primary infertility, does the level of hope negatively correlate with infertility-related stress?

Hope was found to negatively correlate with infertility-related stress (r= -0.51, p<0.01), a large effect size, for women with primary infertility.

Question 6b. For women experiencing secondary infertility, does the level of hope negatively correlate with infertility-related stress?

The correlation between hope and infertility-related stress for women with secondary infertility failed to be significant (r= -0.18, p>0.05).

Question 6c. Is there a significant difference in the correlation between hope and infertility-related stress for women with primary infertility in comparison to women with secondary infertility?

Using the Fisher Z test, the difference in the relationship between hope and infertility-related stress was found to be statistically significant when comparing women with primary and secondary infertility (z= -4.4, p<0.01). Higher levels of hope related to

lower levels of infertility-related stress for women with primary infertility yet higher levels of hope failed to relate to lower levels of infertility-related stress for women with secondary infertility.

Question 7. Does the effect of hope on subjective well-being depend on whether women are experiencing primary or secondary infertility, such that hope positively relates to subjective well-being for women with primary infertility, but hope fails to have a significant relationship with subjective well-being for women experiencing secondary infertility?

Hierarchical regression analyses (see tables 10-14) were run, controlling for the demographic variables of socioeconomic status, age, and length of relationship. Life satisfaction, positive affect, negative affect, and subjective well-being were the criterion variables; hope was the predictor variable; and the type of infertility was added as the third step. The interaction between hope and infertility type was added last. The type of infertility failed to moderate the relationship between hope and life satisfaction ($\Delta F_{3,155}$=0.04, $\Delta R^2_{3,155}$=0.00, p>0.05), hope and positive affect ($\Delta F_{3,155}$=0.10, $\Delta R^2_{3,155}$=0.00, p>0.05), hope and negative affect ($\Delta F_{3,155}$=1.00, $\Delta R^2_{3,155}$=0.01, p>0.05), and hope and subjective well-being ($\Delta F_{3,155}$=0.58, $\Delta R^2_{3,155}$=0.002, p>0.05),

Question 8. Does the effect of hope on infertility-related stress depend on whether women are experiencing primary or secondary infertility, such that hope negatively relates to infertility-related stress for women with primary infertility, but hope fails to have a significant relationship with infertility-related stress for women experiencing secondary infertility?

A hierarchical regression analysis was run using socioeconomic status, age, and length of relationship as control variables; infertility-related stress as the criterion variable, hope as the predictor variable, and the type of infertility added as a third step. The interaction between hope and infertility type was significant ($\Delta F_{3,155}$=5.00, $\Delta R^2_{3,155}$=0.02, p<0.05). In summary, the type of infertility failed to moderate the relationship between hope and subjective well-being but type of infertility moderated the relationship between hope and infertility-related stress.

Table 5: Hierarchical Regression Examining Moderation of Type of Infertility with Self-Compassion on Life Satisfaction

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.27	.07	159	4.06		.01	
	Age					.01	.87	.00
	Relationship length					-.12	.15	.01
	Socioeconomic Status (SES)					.25	.00	.06
Step 2:		.54	.22	158	48.52		.00	
	Age					.02	.84	.00
	Relationship length					-.12	.11	.01
	SES					.20	.01	.03
	Self-Compassion					.47	.00	.22
Step 3:		.55	.01	157	2.82		.10	
	Age					.00	.97	.00
	Relationship length					-.13	.07	.02
	SES					.19	.01	.03
	Self-Compassion					.47	.00	.22
	Type of Infertility					.12	.10	.01
Step 4:		.55	.01	156	1.24		.27	
	Age					.01	.87	.00
	Relationship length					-.14	.06	.02
	SES					.18	.01	.03
	Self-Compassion					.69	.00	.05
	Type of Infertility					.42	.14	.01
	Self-Compassion X Type of Infertility					-.38	.27	.01

Table 6: Hierarchical Regression Examining Moderation of Type of Infertility with Self-Compassion on Positive Affect

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.08	.01	159	.38		.77	
	Age					-.08	.35	.00
	Relationship length					.01	.92	.01
	Socioeconomic Status (SES)					.06	.48	.00
Step 2:		.46	.21	158	41.78		.00	
	Age					-.08	.31	.01
	Relationship length					.01	.87	.00
	SES					.00	.97	.00
	Self-Compassion					.46	.00	.21
Step 3:		.48	.01	157	2.21		.14	
	Age					-.09	.24	.01
	Relationship length					.00	.96	.00
	SES					.00	.99	.00
	Self-Compassion					.46	.00	.21
	Type of Infertility					.11	.14	.01
Step 4:		.48	.00	156	.33		.57	
	Age					-.09	.28	.01
	Relationship length					-.01	.94	.00
	SES					-.01	.95	.00
	Self-Compassion					.58	.01	.04
	Type of Infertility					.27	.36	.00
	Self-Compassion X Type of Infertility					-.21	.57	.00

Table 7: Hierarchical Regression Examining Moderation of Type of Infertility with Self-Compassion on Negative Affect

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.31	.09	159	5.49		.001	
	Age					-.11	.15	.01
	Relationship length					-.20	.01	.04
	Socioeconomic Status (SES)					-.12	.15	.01
Step 2:		.61	.27	158	67.88		.00	
	Age					-.11	.13	.01
	Relationship length					-.21	.003	.04
	SES					-.05	.44	.00
	Self-Compassion					-.53	.00	.27
Step 3:		.61	.01	157	2.73		.10	
	Age					-.12	.09	.01
	Relationship length					-.22	.001	.04
	SES					-.05	.41	.00
	Self-Compassion					-.52	.00	.27
	Type of Infertility					.11	.10	.01
Step 4:		.62	.01	156	1.75		.19	
	Age					-.11	.13	.01
	Relationship length					-.23	.001	.04
	SES					-.07	.33	.01
	Self-Compassion					-.28	.15	.01
	Type of Infertility					.45	.09	.01
	Self-Compassion X Type of Infertility					-.42	.19	.01

Table 8: Hierarchical Regression Examining Moderation of Type of Infertility with Self-Compassion on Subjective Well-Being

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.21	.04	159	2.45		.07	
	Age					.02	.85	.00
	Relationship length					.04	.62	.00
	Socioeconomic Status (SES)					.19	.02	.03
Step 2:		.69	.43	158	129.64		.00	
	Age					.02	.76	.00
	Relationship length					.05	.44	.00
	SES					.11	.06	.01
	Self-Compassion					.66	.00	.43
Step 3:		.69	.003	157	.78		.38	
	Age					.01	.83	.00
	Relationship length					.04	.53	.00
	SES					.11	.07	.01
	Self-Compassion					.66	.00	.43
	Type of Infertility					.05	.38	.00
Step 4:		.69	.00	156	.06		.81	
	Age					.02	.81	.00
	Relationship length					.04	.54	.00
	SES					.11	.07	.01
	Self-Compassion					.70	.00	.05
	Type of Infertility					.11	.65	.00
	Self-Compassion X Type of Infertility					-.07	.81	.00

Table 9: Hierarchical Regression Examining Moderation of Type of Infertility with Self-Compassion on Fertility-Related Stress

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.32	.11	159	6.23		.001	
	Age					-.17	.05	.02
	Relationship length					-.02	.81	.00
	Socioeconomic Status (SES)					-.23	.00	.05
Step 2:		.62	.27	158	69.16		.00	
	Age					-.17	.02	.02
	Relationship length					-.02	.72	.00
	SES					-.16	.01	.02
	Self-Compassion					-.53	.00	.27
Step 3:		.62	.00	157	.26		.61	
	Age					-.17	.02	.02
	Relationship length					-.03	.66	.00
	SES					-.17	.01	.02
	Self-Compassion					-.53	.00	.27
	Type of Infertility					.03	.61	.00
Step 4:		.62	.00	156	.56		.46	
	Age					-.17	.01	.02
	Relationship length					-.03	.69	.00
	SES					-.16	.02	.02
	Self-Compassion					-.66	.001	.05
	Type of Infertility					-.16	.55	.00
	Self-Compassion X Type of Infertility					.24	.46	.00

Table 10: Hierarchical Regression Examining Moderation of Type of Infertility with Hope on Life Satisfaction

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.27	.08	158	4.26		.01	
	Age					.02	.81	.02
	Relationship length					-.13	.13	.01
	Socioeconomic Status (SES)					.26	.002	.06
Step 2:		.60	.29	157	71.10		.00	
	Age					.01	.86	.00
	Relationship length					-.04	.62	.00
	SES					.11	.11	.01
	Hope					.56	.00	.29
Step 3:		.61	.01	156	2.84		.09	
	Age					.00	.99	.00
	Relationship length					-.05	.48	.00
	SES					.10	.14	.01
	Hope					.60	.003	.04
	Type of Infertility					.16	.58	.00
Step 4:		.61	.00	155	.04		.85	
	Age					.00	.99	.00
	Relationship length					-.05	.48	.00
	SES					.10	.14	.01
	Hope					.60	.003	.04
	Type of Infertility					.17	.58	.00
	Hope X Type of Infertility					- .07	.85	.00

Table 11: Hierarchical Regression Examining Moderation of Type of Infertility with Hope on Positive Affect

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.10	.01	158	.48		.70	
	Age					-.11	.23	.01
	Relationship length					.03	.23	.00
	Socioeconomic Status (SES)					.04	.66	.00
Step 2:		.44	.18	157	35.59		.00	
	Age					-.11	.16	.01
	Relationship length					.10	.19	.00
	SES					-.08	.30	.01
	Hope					.45	.00	.18
Step 3:		.45	.01	156	2.58		.11	
	Age					-.13	.12	.01
	Relationship length					.09	.28	.01
	SES					-.09	.27	.01
	Hope					.45	.00	.18
	Type of Infertility					.12	.11	.01
Step 4:		.45	.00	155	.10		.76	
	Age					-.13	.12	.01
	Relationship length					.09	.27	.01
	SES					-.09	.26	.01
	Hope					.51	.02	.03
	Type of Infertility					.22	.51	.00
	Hope X Type of Infertility					-.12	.76	.00

Table 12: Hierarchical Regression Examining Moderation of Type of Infertility with Hope on Negative Affect

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.30	.09	158	5.31		.002	
	Age					-.09	.29	.01
	Relationship length					-.22	.01	.04
	Socioeconomic Status (SES)					-.10	.22	.01
Step 2:		.44	.10	157	18.99		.00	
	Age					-.09	.29	.01
	Relationship length					-.27	.00	.06
	SES					-.01	.87	.00
	Hope					-.33	.00	.10
Step 3:		.45	.01	156	2.08		.15	
	Age					-.10	.23	.01
	Relationship length					-.29	.00	.07
	SES					-.02	.83	.00
	Hope					-.33	.00	.10
	Type of Infertility					.11	.15	.01
Step 4:		.45	.01	155	1.00		.32	
	Age					-.10	.22	.01
	Relationship length					-.30	.00	.07
	SES					-.004	.96	.00
	Hope					-.54	.02	.03
	Type of Infertility					-.22	.52	.00
	Hope X Type of Infertility					.39	.32	.01

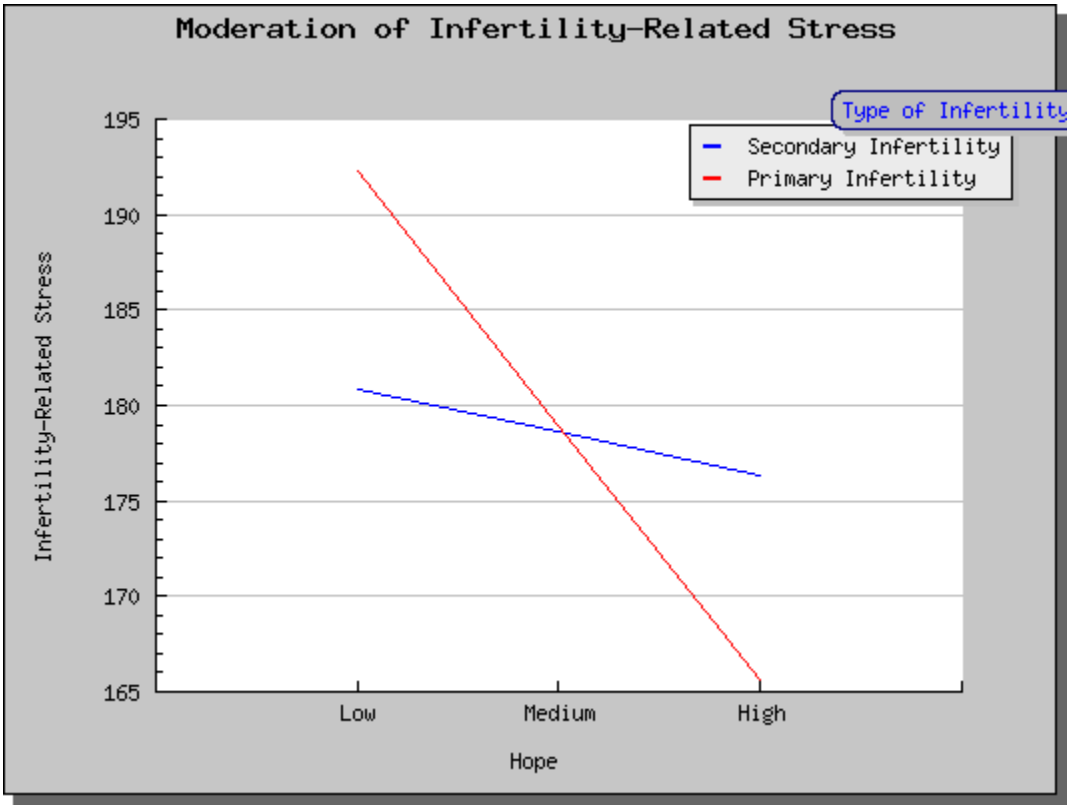
Table 13: Hierarchical Regression Examining Moderation of Type of Infertility with Hope on Subjective Well-Being

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.20	.04	158	2.10		.10	
	Age					.00	.97	.00
	Relationship length					.06	.51	.00
	Socioeconomic Status (SES)					.18	.03	.03
Step 2:		.61	.34	157	85.30		.00	
	Age					-.01	.93	.00
	Relationship length					.15	.03	.02
	SES					.02	.77	.00
	Hope					.61	.00	.34
Step 3:		.62	.003	156	.73		.40	
	Age					-.01	.86	.00
	Relationship length					.15	.04	.02
	SES					.02	.79	.00
	Hope					.61	.00	.34
	Type of Infertility					.06	.40	.00
Step 4:		.62	.002	155	.58		.45	
	Age					-.01	.87	.00
	Relationship length					.15	.03	.02
	SES					.01	.89	.00
	Hope					.75	.00	.06
	Type of Infertility					.27	.35	.00
	Hope X Type of Infertility					-.26	.45	.00

Table 14: Hierarchical Regression Examining Moderation of Type of Infertility with Hope on Fertility-Related Stress

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.32	.10	158	5.83		.001	
	Age					-.16	.06	.02
	Relationship length					-.02	.77	.00
	Socioeconomic Status (SES)					-.22	.01	.04
Step 2:		.48	.13	157	27.32		.00	
	Age					-.15	.05	.02
	Relationship length					-.09	.26	.01
	SES					-.12	.11	.01
	Hope					-.38	.00	.13
Step 3:		.48	.001	156	.26		.61	
	Age					-.12	.04	.02
	Relationship length					-.09	.24	.01
	SES					-.12	.11	.01
	Hope					-.38	.00	.13
	Type of Infertility					.04	.61	.00
Step 4:		.51	.02	155	5.00		.03	
	Age					-.16	.04	.02
	Relationship length					-.11	.15	.01
	SES					-.10	.20	.01
	Hope					-.84	.00	.07
	Type of Infertility					-.66	.04	.02
	Hope X Type of Infertility					.83	.03	.02

Figure 4: Moderation of Fertility-Related Stress



Question 9. Do the psychological variables of self-compassion and hope predict additional variance in subjective well-being beyond that predicted by the type of infertility?

Question 10. Do the psychological variables of self-compassion and hope predict additional variance in infertility-related stress beyond that predicted by the type of infertility?

Hierarchical regression analyses were run, with the biological variable infertility type entered in the first step and the psychological variables entered as a second step after controlling for the demographic variables of socioeconomic status, age, and length of relationship. The psychological variables of self-compassion and hope predicted

additional variance than that predicted by type of infertility for life satisfaction (ΔR^2 =0.33), positive affect (ΔR^2 =0.26), negative affect (ΔR^2 =0.28), subjective well-being affect (ΔR^2 =0.51) and infertility-related stress (ΔR^2 =.28). Additionally, self-compassion was a statistically significant predictor in all four regressions after controlling for hope, whereas hope added additional variance after controlling for self-compassion only for the dependent variables of life satisfaction, positive affect, and subjective well-being. Further, self-compassion had a large effect for positive affect, negative affect, subjective well-being, and infertility-related stress as well as a medium effect for life satisfaction. Hope had a large effect for life satisfaction, positive affect, and subjective well-being in addition to a medium effect for infertility-related stress.

Table 15: Summary of Hierarchical Regression Predicting Life Satisfaction

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.27	.08	158	4.26		.01	
	Age					.02	.81	.00
	Relationship length					-.13	.13	.01
	Socioeconomic Status (SES)					.26	.002	.06
Step 2:		.29	.01	157	1.64		.20	
	Age					.01	.91	.00
	Relationship length					-.14	.09	.02
	SES					.25	.002	.06
	Type of Infertility					.10	.20	.01
Step 3:		.65	.00	155	44.48		.00	
	Age					.00	.97	.00
	Relationship length					-.07	.29	.00
	SES					.11	.09	.01
	Type of Infertility					.11	.07	.01
	Self-Compassion					.25	.00	.04
	Hope					.42	.00	.11

Table 16: Summary of Hierarchical Regression Predicting Positive Affect

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.10	.01	158	.48		.70	
	Age					-.11	.23	.01
	Relationship length					.03	.72	.00
	Socioeconomic Status (SES)					.04	.66	.00
Step 2:		.14	.01	157	1.85		.18	
	Age					-.12	.18	.01
	Relationship length					.01	.88	.00
	SES					.03	.69	.00
	Type of Infertility					.11	.18	.01
Step 3:		.53	.00	155	28.37		.00	
	Age					-.12	.11	.01
	Relationship length					.06	.45	.00
	SES					-.08	.30	.01
	Type of Infertility					.12	.08	.01
	Self-Compassion					.34	.00	.08
	Hope					.26	.003	.04

Table 17: Summary of Hierarchical Regression Predicting Negative Affect

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.30	.09	158	5.31		.002	
	Age					-.09	.29	.01
	Relationship length					-.22	.01	.04
	Socioeconomic Status (SES)					-.10	.22	.01
Step 2:		.32	.01	157	2.06		.15	
	Age					-.10	.23	.01
	Relationship length					-.24	.004	.05
	SES					-.10	.20	.01
	Type of Infertility					.11	.15	.01
Step 3:		.62	.00	155	35.00		.00	
	Age					-.10	.15	.01
	Relationship length					-.25	.001	.05
	SES					-.03	.67	.00
	Type of Infertility					.10	.13	.01
	Self-Compassion					-.51	.00	.18
	Hope					-.04	.65	.00

Table 18: Summary of Hierarchical Regression Predicting Subjective Well-Being

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.20	.04	158	2.10		.10	
	Age					.00	.97	.00
	Relationship length					.06	.51	.00
	Socioeconomic Status (SES)					.18	.03	.03
Step 2:		.21	.002	157	.32		.57	
	Age					-.002	.98	.00
	Relationship length					.05	.57	.00
	SES					.18	.03	.03
	Type of Infertility					.05	.57	.00
Step 3:		.74	.00	155	88.61		.00	
	Age					-.01	.90	.00
	Relationship length					.10	.08	.01
	SES					.03	.60	.00
	Type of Infertility					.06	.26	.00
	Self-Compassion					.50	.00	.17
	Hope					.33	.00	.07

Table 19: Summary of Hierarchical Regression Predicting Fertility-Related Stress

	Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	*Semi-partial* r^2
Step 1:		.32	.10	158	5.83		.001	
	Age					-.16	.06	.02
	Relationship length					-.02	.77	.00
	Socioeconomic Status (SES)					-.22	.006	.04
Step 2:		.32	.002	157	.30		.58	
	Age					-.17	.05	.02
	Relationship length					-.03	.71	.00
	SES					-.22	.005	.05
	Type of Infertility					.04	.58	.00
Step 3:		.62	.28	155	35.66		.00	
	Age					-.16	.02	.02
	Relationship length					-.05	.71	.00
	SES					-.14	.05	.02
	Type of Infertility					.03	.65	.00
	Self-Compassion					-.47	.00	.15
	Hope					-.12	.14	.01

Additional Analyses

MacKinnon and Luecken (2008) have described the need to increase understanding of the processes that underlie the relationship between psychosocial variables and health outcomes. They have highlighted mediation as a form of statistical analyses that answers "how" the independent variable relates to the dependent variable through the relationship with the mediating variable. The investigation of how variables relate allows for the development of interventions that more effectively target the causal pathways between them (MacKinnon & Luecken, 2008). Theoretically, self-compassion

could serve as a mediator between hope and the outcomes of subjective well-being and infertility-related stress. The relationship between hope's two components of agency and pathway might be related to positive outcomes for women experiencing infertility when they are able to view their infertility-related goals with a self-compassionate approach. Because all analyses thus far have analyzed women with primary and secondary infertility separately, mediation analyses also will be assessed separately for the two samples.

Before mediation could be analyzed statistically for these variables, three regressions were completed for women with primary infertility (Frazier, Tix, & Barron, 2004). First, hope was regressed on self-compassion to establish their relationship, finding a significant relationship ($F_{1, 113}$=75.41, p<0.001). As the second step, hope was regressed separately on the individual dependent variables of life satisfaction ($F_{1, 113}$=60.89, p<0.001), positive affect ($F_{1, 113}$=22.14, p<0.001), and negative affect ($F_{1, 113}$=16.17, p<0.001) demonstrating the existence of a significant relationship between them that can be mediated. Finally, self-compassion was added to the regression of hope on the separately regressed dependent variables of life satisfaction, positive affect, and negative affect. The significance of the relationship between hope and negative affect and between hope and positive affect disappeared once self-compassion was added to the model, indicating that self-compassion mediates the relationship between hope and negative affect as well as the relationship between hope and positive affect. However, the relationship between hope and life satisfaction failed to change significantly once self-compassion was included in the model. Tables 20-23 and Figures 5-6 present the mediation model.

The same steps were taken to analyze whether self-compassion mediated the relationship between hope and infertility-related stress, finding an insignificant decrease in the relationship between hope and infertility-related stress once self-compassion was included in the regression model for women with primary infertility. Table 23 presents more detailed information on this mediation model.

The same mediation model was run for the sample of women with secondary infertility using positive affect and life satisfaction as the outcomes. Due to the lack of significant correlations between hope and negative affect as well as between hope and infertility-related stress, a mediation model for these variables was not assessed. Instead, three regressions were completed for women with secondary infertility (Frazier, Tix, & Barron, 2004). Hope was regressed on self-compassion to assess their relationship, finding a significant relationship ($F_{1, 51}$=7.80, p<0.01). As the second step, hope was regressed separately on the individual dependent variables of life satisfaction ($F_{1, 51}$=23.23, p<0.001) and positive affect ($F_{1, 51}$=11.82, p<0.01) demonstrating the existence of a significant relationship between them that can be mediated. Finally, self-compassion was added to the regression of hope on the separately regressed depended variables of life satisfaction and positive affect. The relationship between hope and life satisfaction and between hope and positive affect failed to decrease significantly once self-compassion was added to the model, indicating that mediation did not occur.

Table 20: Mediation Effects of Self-Compassion on Hope in Predicting Life Satisfaction for Women with Primary Infertility

Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	Semi-partial r^2
Step 1:							
Outcome: Self-Compassion	0.63	0.40	113	75.41		0.00	
Predictor: Hope					0.63	0.00	0.40
Step 2:							
Outcome: Life Satisfaction	0.59	0.34	113	60.89		0.00	
Predictor: Hope					0.59	0.00	0.35
Step 3:							
Outcome: Life Satisfaction	0.64	0.41	112	38.06		0.00	
Mediator: Self-Compassion					0.30	0.00	0.05
Predictor: Hope					0.40	0.00	0.10

Table 21: Mediation Effects of Self-Compassion on Hope in Predicting Positive Affect for Women with Primary Infertility

Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	Semi-partial r^2
Step 1:							
Outcome: Self-Compassion	0.63	0.40	113	75.41		0.00	
Predictor: Hope					0.63	0.00	0.40
Step 2:							
Outcome: Positive Affect	0.41	0.16	113	22.14		0.00	
Predictor: Hope					0.41	0.00	0.17
Step 3:							
Outcome: Positive Affect	0.51	0.26	112	19.89		0.00	
Mediator: Self-Compassion					0.41	0.00	0.10
Predictor: Hope					0.15	0.16	0.01

Table 22: Mediation Effects of Self-Compassion on Hope in Predicting Negative Affect for Women with Primary Infertility

Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	Semi-partial r^2
Step 1:							
Outcome: Self-Compassion	0.63	0.40	113	75.41		0.00	
Predictor: Hope					0.63	0.00	0.40
Step 2:							
Outcome: Negative Affect	0.41	0.16	113	16.17		0.00	
Predictor: Hope					-0.35	0.00	0.26
Step 3:							
Outcome: Negative Affect	0.51	0.26	112	19.89		0.00	
Mediator: Self-Compassion					-0.52	0.00	0.17
Predictor: Hope					-0.02	0.83	0.00

Table 23: Mediation Effects of Self-Compassion on Hope in Predicting Fertility-Related Stress for Women with Primary Infertility

Predictors	*R*	ΔR^2	*df*	ΔF	β *	*p*	Semi-partial r^2
Step 1:							
Outcome: Self-Compassion	0.63	0.40	113	75.41		0.00	
Predictor: Hope					0.63	0.00	0.40
Step 2:							
Outcome: Fertility-Stress	0.26	0.26	113	39.07		0.00	
Predictor: Hope					-0.51	0.00	0.26
Step 3:							
Outcome: Fertility-Stress	0.62	0.38	112	34.29		0.00	
Mediator: Self-Compassion					-0.45	0.00	0.12
Predictor: Hope					-0.02	0.02	0.03

Table 24: Mediation Effects of Self-Compassion on Hope in Predicting Life Satisfaction for Women with Primary Infertility

Predictors		R	ΔR^2	df	ΔF	β *	p	Semi-partial r^2
Step 1:								
Outcome:	Self-Compassion	0.36	0.13	51	7.80		0.01	
Predictor:	Hope					0.36	0.01	0.13
Step 2:								
Outcome:	Life Satisfaction	0.56	0.31	51	23.23		0.00	
Predictor:	Hope					0.56	0.00	0.31
Step 3:								
Outcome:	Life Satisfaction	0.57	0.33	112	12.20		0.00	
Mediator:	Self-Compassion					0.13	0.30	0.01
Predictor:	Hope					0.51	0.00	0.23

Table 25: Mediation Effects of Self-Compassion on Hope in Predicting Positive Affect for Women with Secondary Infertility

Predictors		R	ΔR^2	df	ΔF	β *	p	Semi-partial r^2
Step 1:								
Outcome:	Self-Compassion	0.36	0.13	51	7.80		0.007	
Predictor:	Hope					0.36	0.007	0.13
Step 2:								
Outcome:	Positive Affect	0.43	0.19	51	11.82		0.001	
Predictor:	Hope					0.43	0.001	0.18
Step 3:								
Outcome:	Positive Affect	0.49	0.24	50	7.95		0.001	
Mediator:	Self-Compassion					0.25	0.067	0.05
Predictor:	Hope					0.34	0.012	0.10

Figure 5: Mediation for Positive Affect for Women with Primary Infertility

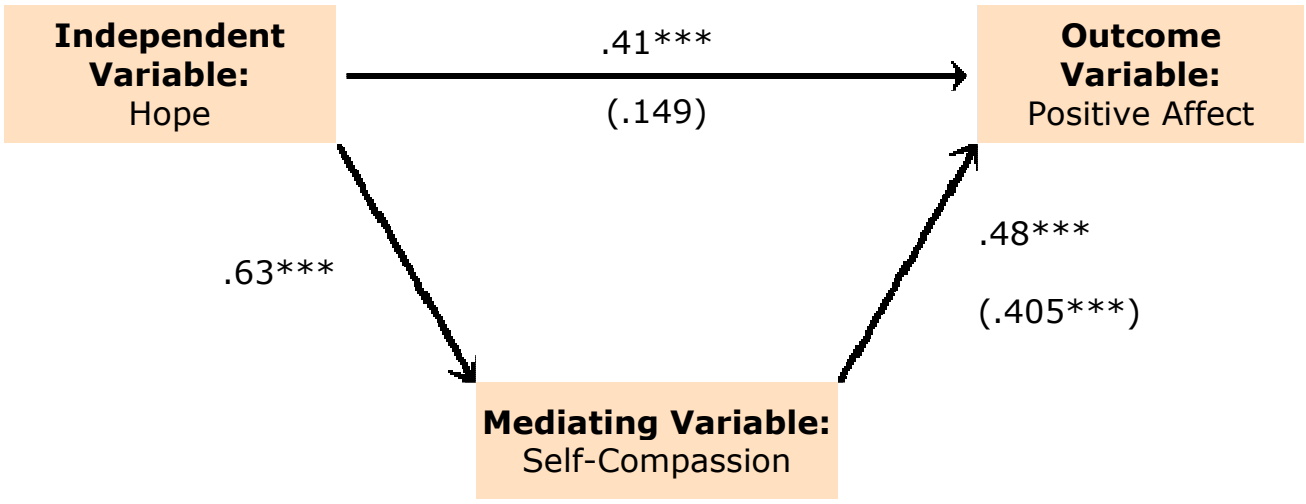
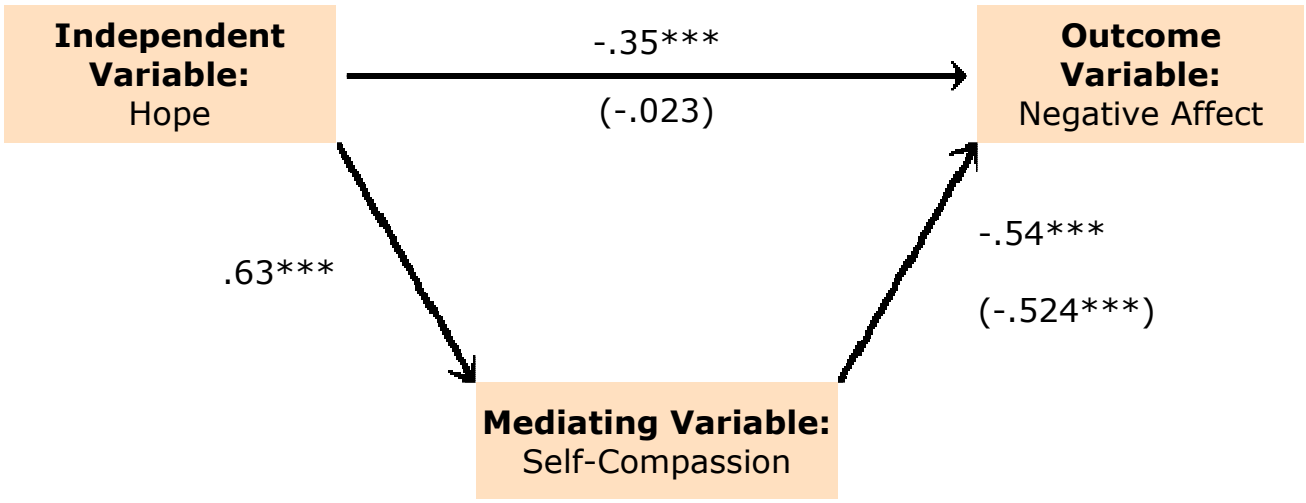


Figure 6: Mediation for Negative Affect for Women with Primary Infertility



Summary of Quantitative Findings

In summary, no significant differences were found in the reported levels of subjective well-being or fertility-related stress in the two groups of women. Furthermore, no significant differences were found in the relation between self-compassion with subjective well-being, in the relation between self-compassion and fertility-related stress, and in the relation between hope and subjective well-being depending on infertility type. The type of infertility failed to moderate the relation between self-compassion with subjective well-being and fertility-related stress as well as failed to moderate the relation between hope with subjective well-being. However, hope failed to correlate with infertility-related stress and with negative affect for women with secondary infertility. In other words, reported higher levels of hope related to lower levels of infertility-related stress were found for women with primary infertility but not for women with secondary infertility. The differences in the relation between hope and negative affect depending on the infertility type failed to be significant. But the interaction between infertility type with hope on the outcome of infertility-related stress was significant such that infertility type moderated this relationship. Additionally, both hope and self-compassion predicted significant variance in all dependent variables above and beyond that predicted by demographic and biological variables. Finally, self-compassion mediated the relationship between hope and positive affect as well as between hope and negative affect for women with primary infertility but not for women with secondary infertility. To provide analysis of the relevant social variables, the results of the open-ended questions are presented next.

Analysis of Open-Ended Questions

Question11a. What are the positive and negative aspects of women's experiences with infertility-specific online support groups?

The following open-ended questions were included to address this topic: (1) What is the best thing about using an online infertility support group (2) What is the worst thing about using an online infertility support group? These open-ended questions were coded into categories by two raters to find common themes. Then a team of three raters coded each response into the identified categories and inter-rater reliability was calculated.

Responses to the open-ended question inquiring as to the best aspects of using on online infertility support group fit into the following categories: (a) information or shared knowledge, (b) social or emotional support (e.g., decreased isolation, place to release emotions), and (c) structure of the online group (e.g., free, anonymity). A fourth category of "other" was used to capture any responses that failed to fit into the other three categories, but only 3.3% of responses were given a rating of "other." Over 75% (75.8%) of responses described the social or emotional support and 22% answered that the information or shared knowledge was the best aspect of the online support group. Nearly 20% (18.7%) of respondents mentioned the structure of the online group as the best thing about using an online infertility support group. Almost 20% of responses cited more than one category that was considered the best aspect of online support group use. Among the three codes, cohen's kappa values ranged from .71 to .81, with an average cohen's kappa value of .79.

Responses to the open-ended question about the worse aspects of using an online infertility support group were captured using the following five categories: (a) creates

negative feelings (e.g., stirs up jealousy when others get pregnant), (b) contributes to obsessiveness or is time-consuming, (c) offers inaccurate or unhelpful information, (d), contains limitations due to the online format (e.g., impersonal, not face-to-face), and (e) creates feelings of isolation from the real world or other group members (e.g., cannot relate or getting lost in the crowd). This fifth category represented a specific subset of the category of creating negative emotions in that it specifically focused on negative feelings related to isolation. An "other" category was utilized in 13.5% of the coded responses, and captured responses such as "all my experiences have been positive" or "I'm too shy to post." Negative emotions in general were described in 30.1% of the responses, with isolation specifically mentioned in 13.5% of responses. References to the limitations of the online format were represented in 33.8% of responses, whereas inaccurate or unhelpful information was described only in 11.3% of responses and the obsessive nature of the use of online support groups was described only in 9.8% of responses. Eleven percent of responses were coded in more than one category. Among the three codes, cohen's kappa values ranged from .74 to .87, with an average cohen's kappa value of .83.

Question 11b. To what extent are women utilizing and relying upon infertility-specific online support groups?

The three likert items in the demographic questionnaire intended to capture this information asked about the frequency of use of online support groups, their perceived helpfulness, and to what extent participants primarily used the online support groups as their outlet for discussing infertility-related concerns. Descriptive statistics for the responses are presented below in Table 26. Spearman rho's correlations between these three items and the independent and dependent variables are found in Figures 7-9.

Significant correlations at the $p<.01$ level were found between the three online use questions, but not between any of these questions and the independent or dependent variables in the primary infertility only sample. In the secondary infertility sample, greater frequency of use was associated with higher infertility-related stress and reliance on online infertility forums as one's only outlet for discussing infertility were related to lower levels of negative affect as well as lowered subjective well-being and these same correlations held in the combined primary and secondary infertility sample. No significant differences were found when running one-way ANOVAs to compare whether women differed in their use ($F_{1,155}=1.85$, $p>0.05$), reliance upon ($F_{1,160}=0.002$, $p>0.05$) and perceived helpfulness of online support groups ($F_{1,159}=0.67$, $p>0.05$) depending on their infertility type.

Table 26. Online Support Group Use						
	PRIMARY		***SECONDARY***		***TOTAL SAMPLE***	
	Mean	***Standard Deviation***	***Mean***	***Standard Deviation***	***Mean***	***Standard Deviation***
Average Frequency of Visits to Online Support Group *(ranging from: 1=Every 2 weeks or less 2=Once per week 3=Once every few days 4=Daily 5=Several times daily)*	***3.23***	***1.58***	***2.89***	***0.87***	***3.12***	***1.41***
Perceived Helpfulness of Online Support Group *(ranging from 1= not at all helpful to 5=very helpful)*	***4.25***	***1.01***	***4.12***	***0.95***	***4.21***	***0.99***
Agreement with the Statement "Internet forums are my primary outlet for discussing infertility." *(ranging from 1=strong disagree to 5=strongly agree)*	***3.99***	***1.41***	***3.98***	***1.22***	***3.99***	***1.35***

Figure 7: Bivariate Correlations for Primary Infertility Sample: Online Support Group

	SCS	HOPE	SWLS	PosAff	NegAf	SWB	FPI	Frequency	Only Outlet	Helpfulness
SCS	1.00									
HOPE	0.63**	1.00								
SWLS	0.55**	0.59**	1.00							
PosAff	0.48**	0.41**	0.30**	1.00						
NegAf	-0.54**	-0.35**	-0.34**	-0.30**	1.00					
SWB	0.71**	0.61**	0.75**	0.74**	-0.73**	1.00				
FPI	-0.59**	-0.51**	-0.61**	-0.39**	0.53**	-.69**	1.00			
Frequency	-0.08	-0.12	-0.13	-0.09	0.28*	-0.21*	0.29*	1.00		
Only Outlet	0.07	-0.11	-0.19*	-0.04	0.12	-0.15	0.16	0.52**	1.00	
Helpfulness	0.04	0.01	-0.14	-0.08	0.16	-0.16	-.12	0.60**	0.70**	1.00

Key to Abbreviations in Figure 2: SCS (Self-Compassion Scale); HOPE (Hope Scale); SWLS (Satisfaction with Life Scale); PosAff (Positive Affect subscale of Positive and Negative Affect Schedule; PANAS); NegAf (Negative Affect subscale of Positive and Negative Affect Schedule; PANAS); FPI (Fertility Problem Inventory); Frequency (Frequency of Visits to Online Infertility Support Group, higher number indicates more frequent use); Only Outlet (Reliance on online infertility forums as only outlet to discuss infertility; higher number indicates greater reliance on Internet forums as primary outlet for discussing infertility); Helpfulness (Helpfulness rating of infertility online support group; higher number indicates greater perceived helpfulness). Correlations significant at $p<.01$ are marked with a "**". Correlations significant at $p<.05$ are marked with a "*".

Figure 8: Bivariate Correlations for Secondary Infertility Sample: Online Support Group

	SCS	HOPE	SWLS	PosAff	NegAff	SWB	FPI	Frequency	Only Outlet	Helpfulness
SCS	1.00									
HOPE	0.36**	1.00								
SWLS	0.32*	0.56**	1.00							
PosAff	0.37**	0.43**	0.30*	1.00						
NegAf	-0.55**	-0.21	-0.27	-0.23	1.00					
SWB	0.59**	0.55**	0.72**	0.68**	-0.74**	1.00				
FPI	-0.43**	-0.18	-0.32*	-0.10	0.67**	-0.53**	1.00			
Frequency	-0.12	0.08	-0.20	-0.09	0.18	-0.22	0.41**	1.00		
Only Outlet	-0.33*	-0.22	-0.35*	-0.24	0.39**	-0.46**	0.29*	0.50**	1.00	
Helpfulness	-0.17	-0.09	-0.22	-0.11	0.19	-0.25	0.25	0.61**	0.48**	1.00

Key to Abbreviations in Figure 2: SCS (Self-Compassion Scale); HOPE (Hope Scale); SWLS (Satisfaction with Life Scale); PosAff (Positive Affect subscale of Positive and Negative Affect Schedule; PANAS); NegAf (Negative Affect subscale of Positive and Negative Affect Schedule; PANAS); FPI (Fertility Problem Inventory); SWB (Subjective Well-Being; calculated by adding SWLS+PA-NA); Frequency (Frequency of Visits to Online Infertility Support Group, higher number indicates more frequent use); Only Outlet (Reliance on online infertility forums as only outlet to discuss infertility; higher number indicates greater reliance on Internet forums as primary outlet for discussing infertility); Helpfulness (Helpfulness rating of infertility online support group; higher number indicates greater perceived helpfulness). Correlations significant at $p<.01$ are marked with a "**". Correlations significant at $p<.05$ are marked with a "*".

Figure 9: Bivariate Correlations for Total Sample: Online Support Group

	SCS	HOPE	SWLS	PosAff	NegAff	SWB	FPI	Frequency	Only Outlet	Helpfulness
SCS	1.00									
HOPE	0.55**	1.00								
SWLS	0.49**	0.58**	1.00							
PosAff	0.45**	0.41**	0.31**	1.00						
NegAf	-0.54**	-0.30**	-0.31**	-0.27**	1.00					
SWB	0.68**	0.59**	0.74**	0.72**	-0.72**	1.00				
FPI	-0.55**	-0.18	-0.52**	-0.30**	0.57**	-0.64**	1.00			
Frequency	-0.10	-0.07	-0.15	-0.09	.23**	-0.20*	0.31**	1.00		
Only Outlet	-0.33*	-0.22	-0.35*	-0.24	0.25**	-0.46**	0.20*	0.50**	1.00	
Helpfulness	-0.02	-0.02	-0.13	-0.09	0.15	-0.17*	0.16*	0.61**	0.65**	1.00

Key to Abbreviations in Figure 2: SCS (Self-Compassion Scale); HOPE (Hope Scale); SWLS (Satisfaction with Life Scale); PosAff (Positive Affect subscale of Positive and Negative Affect Schedule; PANAS); NegAf (Negative Affect subscale of Positive and Negative Affect Schedule; PANAS); FPI (Fertility Problem Inventory); SWB (Subjective Well-Being; calculated by adding SWLS+PA-NA); Frequency (Frequency of Visits to Online Infertility Support Group, higher number indicates more frequent use); Only Outlet (Reliance on online infertility forums as only outlet to discuss infertility; higher number indicates greater reliance on Internet forums as primary outlet for discussing infertility); Helpfulness (Helpfulness rating of infertility online support group; higher number indicates greater perceived helpfulness). Correlations significant at $p<.01$ are marked with a "**". Correlations significant at $p<.05$ are marked with a "*".

Question 12: How will women respond to the following open-ended questions:

What do you believe is the cause of your infertility?

How has infertility most affected your life?

These final two open-ended questions were analyzed through the same procedure as the two online social support open-ended questions. Two raters coded answers into categories to find common themes, which were then coded by three raters using the identified categories. Inter-rater reliability was calculated for the question related to perceived causes of infertility. In addition to main categories for the question of how infertility had affected participants' lives, responses also were further broken down into content domains and directional effects (i.e., affected them positively, negatively, both positively and negatively, or in a neutral way). Due to the complex coding system implemented for this open-ended question, inter-rater reliability was not calculated except for the main category. However, the average cohen's kappa value was .56, which represents only moderate agreement. Therefore, further discussion was conducted among the three raters to determine the final coding values for this question.

Participants' responses about their perceived causes of infertility fell into the following five categories: (a) biological or medical reason (e.g., age, poor egg quality), (b) psychological reason (e.g., stress, anxiety), (c) preventable behavioral reason (e.g., use of birth control), (d) speculative biological or medical reason that has not been verified (e.g., "perhaps our age"), and (e) unknown general reason (e.g., fate or unknown cause). Nearly 70% of respondents (67.7%) attributed their infertility to identified biological or medical causes, and 13.4% of responses cited speculative biological or medical reasons; over 80% of responses described a biological or medical condition

thought to be responsible for their infertility. Unknown causes of infertility were described by 22.6%, and only 11% of responses cited psychological reasons. A little more than 13% of respondents attributed their infertility to behavioral causes. When coding responses describing the perceived cause of infertility, the inter-rater reliability among the pairs of three coders ranged from .61 to .89, for an average cohen's kappa value of .73.

The categorization of responses to the question of how infertility had most affected participants' lives was complex, and this question was analyzed for its content and directionality (i.e., positive or negative effect). More specifically, four broad categories were used as the first level of analysis: (a) mental health/emotional aspects (e.g., spirituality), (b) physical health/body-related aspects (e.g., pain or intrusiveness of procedures), (c) societal/relationship aspects (e.g., avoid pregnant friends), and (d) daily life functioning (e.g., financial strain or plans for future are on hold). High levels of inter-rater reliability were difficult to obtain for this coding because individual coders often identified two or three broad categories, such that each response could be coded up to 14 different ways depending upon the combination of categories. Once the four main categories had been decided upon, the three coders individually coded 50 items and then compared their ratings to obtain consensus. They then coded the next 50 items individually, and when inter-rater reliability was only moderate, discussion ensured to reach consensus of items that created initial dissension. During these first two rounds, inter-rater reliability ranged from .36 to .67, and averaged .56. Therefore, the three coders repeated the process of individually rating items and then discussing the incongruent ratings for the remaining items. Over eighty percent (81%) of responses referred to

mental health or emotional effects resulting from their infertility experience and 48% described changes in their societal interactions or relationships. Twenty percent mentioned effects in their daily life functioning, and 13% cited physical health or body-related effects of their infertility experience.

Within each of the four main categories, coders indicated when the effect was positive (e.g., “my relationship with my partner became stronger”), negative (e.g., “I felt depressed”), both positive and negative, or neutral (e.g., “we are having difficulty conceiving”). In regards to the directionality of the changes in these four areas of their lives due to their infertility, 71% considered these changes negative, 19% cited both positive and negative changes, and only 4% described only positive changes. Six percent of responses were coded as reporting neutral effects in these four areas.

The four broad categories were broken down further into eleven content domains, described below with the percentage of responses referring to these specific domains indicated in parenthesis. The total percentage for the content domains fails to equal 100% because not all responses fit into one of the content domains and thus, only the most frequently cited domains are listed here. The mental health/emotional aspects category was divided into (a) emotions (67%), (b) spirituality (5%), and (c) identity (20%). The physical health/body-related aspects was divided into the content domains of (a) physical effects of treatment (e.g., intrusive procedures; 2%) and (b) body not functioning properly (e.g., “I feel betrayed by my body”; 2%). The societal/relationship aspects main category was comprised of the content domains of (a) relationship with partner (24%), (b) relationship with family/friends (28%), and (c) relationship or interactions with the rest of society (e.g., strangers; 13%). Finally, the main category of daily life functioning

subsumed the content domains of (a) work/career (5%), (b) finances/payment for treatment (5%), and (c) future plans (e.g., “travel is on hold”; 11%).

Chapter 6

Discussion

This chapter presents a summary and comparative description of the survey participants. Further, conclusions regarding each research hypothesis and question are provided as well as a discussion of post-hoc analyses. This chapter also includes a discussion of the study's limitations and suggests implications for future research and clinical practice.

Sample

Summary and comparison of sample demographic characteristics. The sample of this study was primarily heterosexual married, White, highly educated women. Although the sample's reported sexual orientation and relationship status were similar to that of the general population of women with infertility, the 2002 National Survey of Family Growth (U.S. Department of Health and Human Services, 2002) reports that of women between the ages of 15 and 44 in the United States who report impaired fertility, 72.7% are White, 7.7 % are Latina, and 11.5% are African American. Therefore, the current study's sample somewhat over-represented White women with infertility and under-represented African American and Latina women with infertility. Further, whereas only 19.2% of the current sample reported completing only a high school degree, 64.6% of women with infertility reported completing only a high school degree in the 2002 National Survey of Family Growth (U.S. Department of Health and Human Services, 2002). In this way, the sample was not representative of American women with infertility. However, this limitation of the sample was anticipated based on sample characteristics in the majority of other infertility studies. Compared to much of the

infertility research, the current sample was more demographically diverse in terms of age, socioeconomic status, and employment.

Among the current study's sample of women with primary infertility, the majority was from the United States and nearly 25% were Canadian. In contrast, among participants with secondary infertility, the majority represented the United States and less than 10% represented Canada. The geographic background of the sample is important to account for because each country differs in its policies regarding health benefits coverage of infertility treatment, and the extent of coverage could relate to quantity and quality of treatment options and possibly also distress levels. However, the low number of participants from countries outside of North America made it impossible to run meaningful statistical comparisons across countries of residence and made the findings of this study more applicable to infertile women in the United States.

The age distribution of the current sample was similar to the age of women with secondary infertility in the general American population (U.S. Department of Health and Human Services, 2002). However, primary infertility participants in the current study were younger compared to other American samples, which report that 78.1% of American women with primary infertility are between the ages of 30-44 years of age (U.S. Department of Health and Human Services, 2002). In short, the sample fails to represent all women with infertility in the United States in terms of racial and educational background and fails to represent women with primary infertility in the United States in terms of age. These biases will be explored further in the limitations section.

The socioeconomic background for this sample was more representative of the general infertility population in the United States. The majority of participants rated

themselves as middle class but all income brackets were represented. Although no census data or national statistics on employment related to infertility could be located, the employment status of the current sample failed to differ significantly from that of women in general as presented in U.S. Census Bureau data from 1996 to 1999. In the current sample, more women with children were unemployed compared to women without children, but overall the majority of women with and without children were employed. In short, the socioeconomic and employment background of the study's participants reflected characteristics of the general U.S. population.

Compared to the general population of couples with infertility, those in the current sample with male-factor caused infertility and combined female-male factor were underrepresented and those with female-factor were overrepresented. Perhaps women with female-factor infertility are more likely to utilize online support groups. However, few studies assess the diagnosed cause of participants' infertility, and therefore it is unknown as to how this sample compares to other samples in infertility research.

The majority of respondents reported having utilized medical treatment (87.8%), representing an especially high level of active treatment for women with secondary infertility. Thus, those women with secondary infertility who utilize online infertility support groups appear to be those who are actively seeking medical attention to address their infertility, compared to the large number of women with secondary infertility in the general population who never seek medical treatment.

Comparison of sample's scores on the independent and dependent variables. The two-sample t-tests conducted separately for women with primary infertility and for women with secondary infertility compared to previously reported

samples revealed that the current sample reported greater levels of infertility-related stress, less life satisfaction, less positive affect, and greater negative affect than other infertility studies, as well as lower levels of hope and self-compassion than college women samples. There are several possible explanations for elevations in the sample's distress. Domar et al. (1992) found that women who had experienced infertility for 2-3 years reported greater depression than women who had experienced infertility for less than 1 year. A slight majority of the participants in the current sample (50.2%) described having experienced infertility for the past 1-3 years, and therefore could represent the peak of distress levels when facing infertility. Yet the length of time attempting to get pregnant failed to relate to levels of hope, self-compassion, subjective well-being, and infertility-related stress, so mixed evidence exists for this explanation of increased distress. Perhaps those who seek medical treatment for infertility experience greater distress than those who do not seek medical treatment. Nearly 87% of women with primary infertility and over 90% of women with secondary infertility in this sample reported the use of medical treatment for their infertility. The general population of women with infertility utilizes medical treatment at a much lower rate, especially among women with secondary infertility. It is possible that it is not the length of time women have been trying to get pregnant but whether they have utilized medical treatment that relates to greater distress levels. However, an insignificant number of women who have not utilized medical treatment in the current sample prevented any meaningful statistical comparisons between the two groups.

Further, the use of medical treatment may be confounded with the use of online support groups, such that several women reported that their medical doctors informed

them of online support groups. Similarly to differences in racial and educational backgrounds between the sample and the general population, this increased level of distress in the sample could be due to the online recruitment strategy used. Perhaps infertile women who seek medical treatment or infertile women who have greater levels of distress are more likely to use online infertility support groups compared to those who do not access medical treatment or to less distressed women. However, any conclusions about differences between infertile women who do and do not participate in online infertility support groups must be tentative because so few of studies have used the same distress and well-being measures with the general infertile population.

Hypotheses and Research Question

Comparing the well-being and distress of women with primary and secondary infertility. In contrast to what was conjectured based on previous research (e.g., Epstein & Rosenberg, 2005; McQuillan et al., 2007; Newton et al., 1999), the current study found no significant differences in reported levels of subjective well-being and infertility-related stress for women with primary and secondary infertility who use online infertility support groups. Women with both primary and secondary infertility reported low levels of life satisfaction and positive affect as well as elevated levels of negative affect and infertility-related stress. This unexpected outcome suggests that although the experiences of women with primary and secondary infertility may be different (Bevilacqua, 1998; Newton, et al., 1990; Newton et al., 1999), both groups report significant distress; secondary infertility is not necessarily less distressing than primary infertility.

Failure to find support for these hypotheses raises questions regarding the generalizability of previous studies that reported differences in the well-being of women

with primary and secondary infertility. For instance, Epstein and Rosenberg's (2005) found that women with primary infertility seeking egg donation reported greater levels of depression than women with secondary infertility seeking egg donation. Perhaps this differential experience in depression depending on infertility type is limited to those seeking egg donation, a step in infertility treatment that occurs after less drastic treatment options (e.g., ovulation inducing medication) have been eliminated. In the present study, only 2.9% (n=5) of the participants reported use of a medical treatment involving donor eggs. Therefore, the results of the Epstein and Rosenberg (2005) study fail to be applicable to women who have not reached that level of medical treatment.

Although all research methodologies have the potential to result in some form of selection bias, the findings of the current study raised questions about the potential selection bias that occurs with online recruitment for participants with a medical condition. Perhaps women with secondary infertility who are not members in online infertility support groups do not experience as much distress. A large number of women with secondary infertility never seek medical treatment for their infertility, in great contrast to the 90.6% of women with secondary infertility in the current sample who reported the utilization of medical treatment. Perhaps those with secondary infertility who never seek medical treatment are less likely to use online infertility support groups and also less likely to experience distress. Yet these women could also experience great distress and simply never access online infertility support. Further, those with secondary infertility who utilize online support might find that the internet allows them to express their negative feelings in a manner that is not possible in the non-virtual world. Women with secondary infertility might feel caught between two worlds; they have a child and

thus their lives include what those with primary infertility are yearning for, yet those with secondary infertility are isolated from the world of the fertile because they are unable to have another child when they would like or possibly to ever have another child. In short, based on the current findings, it can only be concluded that women with primary and secondary infertility who utilize online infertility support groups fail to experience significantly different levels of subjective well-being and infertility-related stress.

Research questions about the relevance of self-compassion for women with primary and secondary infertility. Self-compassion was found to have a medium effect size with positive affect and a large effect size with negative affect and with the global construct subjective well-being for both groups of women. Self-compassion was demonstrated to be a relevant construct for the well-being of women with both primary and secondary infertility, especially in relation to negative affect. Those who reported greater levels of self-kindness, mindfulness, and common humanity also reported less negative emotions, more positive emotions, and greater satisfaction with their lives. These findings with a sample of women with infertility mirror previous research's findings that self-compassion positively correlated with positive affect and life satisfaction and negatively correlated with negative affect in a college student sample (Neff, 2003a; Neff, Rude, & Kirkpatrick, 2007).

Although the directionality of the relationship of self-compassion with subjective well-being cannot be determined based on these correlations, it is plausible to conceive of self-compassion as an emotion regulation coping strategy when experiencing a chronic health condition such as infertility. Previous research using college student samples has linked self-compassion to problem-focused coping strategies and positive reframing of

problems, which has been hypothesized to occur because self-compassion allows for a sophisticated level of emotional clarity in the face of difficult circumstances (Neff, Kirkpatrick, & Dejitthirat, 2004). Rather than becoming stuck in rumination or avoiding problems by denying them, the mindfulness component of self-compassion demands approaching problems without becoming consumed by them. Neff (2003a) hypothesizes that self-compassion aids the transformation of negative emotions into a state of more positive feelings, as one approaches painful feelings with kindness, clarity, and a sense of connection with the rest of humanity. As a further extension, Neff, Kirkpatrick, Dejittirat (2004) conceptualize self-compassion as a form of resiliency against the negative impact of acknowledging one's faults. The current study provides evidence that self-compassion relates to improved well-being as women experience negative emotions and cope with their infertility problem, which could be viewed as one of the most devastating types of "one's faults."

Self-compassion related to infertility-related stress inversely for women with primary and secondary infertility, having respectively a large effect size and a medium effect size. No significant differences were reported in this relationship depending on the infertility type. The relationship between higher self-compassion, including its component of mindfulness, and lowered infertility-related stress follows logically based on previous research linking mind/body techniques to improving infertility adjustment (Lemmens, 2004). In their infertility intervention study, Domar et al. (1990) implemented psychoeducation on the topics of self-empathy and compassion, and the current study provides further empirical support for the relevancy of these constructs in managing infertility-related stress. Again, the directionality between self-compassion and infertility-

related stress is unknown; perhaps those with less stress can be more self-compassionate with themselves or those who are self-compassionate with themselves experience less stress when confronting infertility. In short, self-compassion represents an important coping strategy pertinent to the well-being and stress of women experiencing both primary and secondary infertility.

The type of infertility failed to relate to how self-compassion interacted with the well-being and stress levels of women with infertility using online support groups. The data in the current study suggested that women with both types of infertility are experiencing distress that relate to self-compassion's components of self-kindness, common humanity, and mindfulness; the protective benefits of self-compassion could possibly extend beyond the protective factor of already having a child such that self-compassion is a general coping strategy that holds potential for women experiencing different types of infertility. In both groups of women with infertility, self-judgment, isolation, and over-identification with their pain were linked to greater levels of distress and lower levels of well-being while the ability to be gentle with oneself, to remind oneself that others have also experienced their same pain, and to be in touch with their pain without it consuming them was connected to less stress and greater levels of well-being. Very few studies have explored the differences in the psychological functioning of women with different types of infertility (e.g, Epstein & Rosenberg, 2005), and more research is needed on how various psychological variables, such as self-compassion and hope, differentially predict the adjustment of women depending on their infertility type. The current lack of research in this area makes it difficult to explain the applicability of

how and why self-compassion affects well-being and infertility-related stress of women with both primary and secondary infertility.

Research questions about the relevance of hope for women with primary and secondary infertility. For women with both primary and secondary infertility, hope had a large effect size for life satisfaction and global life satisfaction in addition to a medium effect size for positive affect. Hope had a medium effect size with negative affect for women with primary infertility, but failed to have a significant relationship with negative affect for women with secondary infertility. Hope's failure to have a significant relationship with negative affect for women with secondary infertility may stem from the smaller sample size in this group and was not found to be statistically different from the correlation between hope and negative affect for women with primary infertility. More research is needed to determine if the different correlations for hope with negative affect stem from differences in these two populations of women with infertility. Further research could address whether hope is an important variable for understanding the negative emotions experienced by women with secondary infertility.

Although hope had not been studied previously with infertile samples, hope correlated with positive and negative affect in a similar fashion in the current study as with a college student sample. Snyder (2002) conjectures that as goals are met, positive emotions increase and negative emotions decrease. As an extension of this conjecture, it is theorized that as women with infertility meet their general life goals, which likely include their reproductive goals, their positive emotions increase and their negative emotions decrease. Likewise, higher hope is linked to higher life satisfaction and positive

affect for both samples of women, indicating that hope theory is applicable to the positive functioning of this population of women.

For women with primary infertility, hope negatively correlated with infertility-related stress (large effect size), but for women with secondary infertility, the relation between hope and infertility-related stress failed to be significant. Further, significant differences were found in the correlation between hope and infertility-related stress depending on the infertility type such that higher levels of hope related to lower levels of infertility-related stress for women with primary infertility but not for women with secondary infertility. Due to the specific dimensions related to the infertility experience captured in the infertility-related stress measure, more confidence can be placed in these findings because they relate more directly to being infertile than do the findings about hope's relationship with more global measures of functioning.

Snyder (2002) theorizes that higher levels of hope allow those facing obstacles to their goals experience less stress than those with lower levels of hope because hope helps individuals reappraise obstacles as challenges requiring alternate pathways rather than as permanent blockages to goals. Therefore, hope appears to serve as such an appraisal strategy effective for reducing infertility-related stress for women with primary infertility but not for women with secondary infertility. Because the global score on the hope measure was used rather than the agency or pathway subscales score, it is indeterminable as to whether women's infertility type differentially relates to the way they cognitively plan to meet their goals and determine the appropriate route (i.e., pathways) or differentially relates to their beliefs about their abilities to reach their goals, their motivation to do so, or their ability to maintain progress (i.e., agency). If women with

secondary infertility are unable to determine what methods to use to reach their fertility goals or other more general life goals, they might also not be motivated to try for those goals. Or these women might have the energy to try to reach their goals, but are directing that energy into unfeasible pathways that fail to bring them closer to achieving their goals. Nearly 40% of women with secondary infertility reported an unexplained cause of their infertility, compared to nearly 30% of women with primary infertility. Perhaps women with an unexplained cause of infertility, rather than an identified female, male, or combined-factor cause, struggle to identify achievable pathways for their goals, thereby lowering their levels of hope. If they cannot identify what medical steps need to be taken to achieve fertility because they do not know the reason for their infertility, it logically follows that they might lack confidence in the efficacy of any steps they take to achieve fertility. Further, the consideration of adoption as an option might be more complicated now that they have a biological child. Perhaps the methods and motivation used to achieve fertility for the first child no longer become relevant to stress levels when attempting to have additional children. Whereas women with primary infertility might be hopeful that their fertility situation will improve, those with secondary infertility might experience a sense of loss as something that they once had, their ability to have a child, has been taken away from them or been lost. Hope may not capture this experience for women with secondary infertility. In short, hope fails to protect against infertility-related stress for women with secondary infertility but holds the potential to do so for women with primary infertility.

The type of infertility failed to moderate the relationship between hope and subjective well-being variables, but moderated the relationship between hope and

infertility-related stress. In other words, hope's relationship with well-being outcomes did not differ depending on the women's type of infertility, yet hope was relevant to the infertility-related stress levels of women with primary but not secondary infertility. The subjective well-being variables represent more global measures of functioning than that captured in the infertility-related stress outcome. Perhaps hope also represents a more global coping strategy that helps individuals conceptualize their general well-being in a positive way but fails to alleviate distress stemming from specific concerns related to their infertility. For instance, perhaps when women conceptualize the broad goals that comprise their overall satisfaction with their life (e.g., having a family), their cognitions about their motivation and pathway for achieving their goals protects them against distress. Yet, when those same women consider their specific fertility-related concerns on a smaller scale (e.g., whether to attend a friend's baby shower), as captured in the Fertility Problem Inventory, hope appears to relate to decreased stress for women with primary infertility but not for women with secondary infertility.

In other words, those with primary infertility demonstrated a significantly stronger relationship between their higher levels of hope, including their cognitive reappraisal of obstacles of inevitable but not insurmountable, and their infertility-related stress about their social relationships, sexual concerns, friendships and family relationships, their attitudes toward a childfree lifestyle, and their desire for parenthood than did those with secondary infertility. Hope is a more important coping strategy for managing the specific infertility-related stressors of women with primary infertility than for women with secondary infertility. Other variables that were not explored in the present study, such as social support, resilience, or optimism, might be more critical for

understanding how women with secondary infertility manage their worries over how infertility is affecting their relationships, their sexuality, and other infertility-specific stressors. In summary, the few studies that have examined differences between the experiences of primary and secondary infertility have highlighted the unique challenges of each. The current study reveals that although the overall distress and well-being of these two samples is not significantly different, the importance of hope in relation to their infertility-related stress levels is different.

Hope has been explored as a moderator in relation to depressive symptoms and engagement in daily activities activity in stroke victims (Gum, Snyder, & Duncan, 2006) and in relation to distress and coping in stressful interpersonal situations (Kato, 2006). But no research could be located that analyzed factors that might moderate the relationship between hope and psychological outcomes. Currently, little is known about under what conditions hope holds promise for those facing various medical conditions.

Although hope has been explored largely as a positive coping strategy in relation to psychological, behavioral, and physical outcomes, many have noted the fine line between fostering hope and fostering unrealistic expectations (e.g., Benyamini, 2003). It is unclear as to how having false or unrealistic hopes might connect to the lack of relationship between hope and stress for women with secondary infertility, but it is a concept worth exploration in future research. Possibly hope helps inspire women with primary infertility to continue in their treatment, yet hope fails to inspire women with secondary infertility.

Questions about variance explained by psychological variables above and beyond infertility type. Across all outcomes, self-compassion and hope predicted

additional variance beyond that predicted by the type of infertility. The biological variable of type of infertility held less predictive power than the psychological variables of self-compassion and hope. More specifically, regressions including the biological variable of infertility type but not the psychological variables of self-compassion and hope failed to be significant. In contrast, regressions of age, socioeconomic status, relationship length, infertility type, self-compassion, and hope accounted for 65% of the variance of life satisfaction; 53% of the variance of positive affect; 62% of the variance of negative affect; and 62% of the variance of infertility-related stress. These regressions provide evidence of the importance of psychological variables for understanding the well-being and stress levels of women with infertility.

More specifically, length of relationship and self-compassion emerged as significant individual predictors above and beyond the other variables for the outcome of negative affect, with self-compassion representing 18% of the variation in negative affect after accounting for the other independent variables. It seems that women who are self-compassionate experience fewer negative emotions, suggesting that self-compassion might serve as a valid method for controlling negative emotions. Further, age, socioeconomic status, and self-compassion also emerged as significant individual predictors for the outcome of infertility-related stress, with self-compassion representing 15% of the variation in infertility-related stress after accounting for the other independent variables. In short, self-compassion appears to hold special significance for managing negative outcomes such as negative emotions and infertility-specific stress.

In a study examining the underlying mechanisms for the positive effects of mindfulness, Kyrimis (2007) found that self-compassion, self-judgment, and forgiveness

partially mediated the relationship between mindfulness practices and emotional acceptance. Perhaps self-compassion promotes emotional acceptance in situations that typically arouse strong negative emotions and increased levels of stress. Self-compassion appears to be an especially useful emotional regulation strategy for managing negative emotions and stress related to body issues. In a study with female college students, Berry et al. (2007) suggested that self-compassion could improve women's attitudes towards their bodies. More broadly, Neff (2003a) conceptualizes self-compassion as a construct that differs from self-esteem in its ability to withstand negative feedback and threats to one's ego (Neff, Baumeister, Smart, & Boden, 1996), and presumably infertility could represent a threat to one's ego. Additionally, self-compassion has been proposed as a self-nurturance strategy especially helpful for those with self-critical thinking patterns and interventions presenting self-compassion as a method for self-soothing have recently been implemented (Gilbert & Irons, 2004; Gilbert & Procter, 2006). Although more research is needed in this area, the current study supported previous findings in identifying self-compassion as holding much promise as a self-soothing strategy to manage stress and negative feelings.

Self-compassion and hope both had a large effect size in the regressions for positive affect and life satisfaction. More specifically, hope explained 11% of the variance in life satisfaction after accounting for the other independent variables whereas self-compassion explained 4%. Life satisfaction, as captured by Diener et al. (1985) represents a cognitive assessment of one's life. Therefore, as the more cognitively-based construct among the predictors, it would be anticipated that hope would explain significant variance in life satisfaction. For the outcome of positive affect, after

controlling for the other independent variables, self-compassion explained 8% of the variance and hope explained 4%. In conclusion, self-compassion and hope appear to be especially important variables in understanding the positive functioning of women with infertility.

Additional Analysis

Mediation analyses. Self-compassion mediated the relationship between hope with positive and negative affect for women with primary infertility. In other words, self-compassion serves as a mechanism through which hope relates to positive and negative emotions for those women with primary infertility. Snyder (2002) describes that as people's goals are met, their negative emotions decrease and their positive emotions increase. This same pattern was found for women with primary infertility, in that the sample's ability to treat themselves with self-kindness, to be mindful, and to have a sense of common humanity explained the connection between hope and negative and positive emotions. Snyder (2002) explains that higher levels of hope help those experiencing obstacles to their goals undergo less stress as they reframe blockages as unique challenges that simply require alternate pathways. It appears that for women with primary infertility, their levels of self-compassion are linked to their ability to reappraise their goals (i.e., hope) and to control how their goals relate to their emotional functioning. This suggests that those who have high levels of hope but treat themselves with self-judgment, over-identify with their infertility, and feel isolated from others might experience greater negative emotion and fewer positive emotions. Their reliance on hope as a cognitive strategy relates to their positive and negative emotions based on their levels of self-compassion.

Interestingly, for the primary infertility sample, self-compassion only mediated the relationship between hope and the global measures of positive and negative emotional functioning, but not between hope and infertility-related stress (i.e., a specific measure of emotional functioning) or between hope and life satisfaction (i.e., a type of cognitive functioning). This finding provided evidence for the link between self-compassion and emotions rather than between self-compassion and cognitions (e.g., life satisfaction), perhaps suggesting that self-compassion is a broad-based emotional regulation strategy. Due to the global nature of well-being assessed in this study, it is possible that factors that were not infertility-specific affected it. Perhaps those with higher levels of overall well-being cope better across a variety of situations, and not only in infertility-related situations. Further research is needed on how self-compassion might serve as an emotional regulation strategy for specific stressors such as relationship or sexual concern stemming from infertility.

Hope failed to have a significant relationship with negative affect and infertility-related stress for women with secondary infertility, so mediation was not assessed with these variables. It appeared that for those who already have a child, hope does not predict their experience of infertility-specific and more global negative emotions; something besides their levels of hope might contribute to their levels of stress and general negative affect. Although hope correlates with life satisfaction and positive affect for women with secondary infertility, self-compassion failed to serve as a significant mediator to explain these correlations. It may be that the nature of one's hopes and the ability of self-compassion to emotionally buffer against these hopes changes depend on whether or not one has had a child previously.

Open-Ended Questions

Positive and negative aspects of online infertility support groups. Women described the information and knowledge shared, the social and emotional support received, and the structure of the online infertility groups as the groups' best aspects. The social and emotional supported was cited in 75.8% of responses. The groups served as a place where the majority of participants reported that they found hope and inspiration in others who understood their circumstances first-hand. Members portrayed the groups as a place to release emotion and decrease their isolation. As one participant noted, the best aspects are that the online support groups are a place where "other people [are] going through the same thing! I am not the only one . . . finding others in my situation . . .identifying w/ their feelings, validating each others' experiences, being UNDERSTOOD!"

The information or shared knowledge garnered from the group experienced was mentioned in 22% of responses. They reported that the online groups allowed them to learn of new treatment options, gain insight from others' experiences, and to "compare notes" on how others are dealing with their infertility. In short, the online infertility support groups serve to normalize women's experiences with infertility and to help them connect with others who have experienced similar situations. This normalizing feature of the online support group theoretically related to the common humanity element of self-compassion, and the general knowledge that others have gone through what they are going through.

Moreover, the structure of the online groups was perceived as one of their best aspects in 18.7% of responses. Participants noted that they could always find another

group member online at any time of the day or night, and that they appreciated the anonymity that came from the online format. For some, that anonymity made it easier for them to discuss their infertility problem openly. Others commented on the groups as a place where they could discuss their thoughts and feelings for free, in contrast to much of the high cost associated with infertility treatment.

As negative aspects of their online support group experience, participants (30.1%) described how their group participation can result in negative emotions, become time-consuming and contribute to rumination and obsession with their infertility (9.8%), inaccurate or unhelpful information (11.3%), and feelings of isolation from the other group members when they have difficulty relating to other group members (13.5%). Furthermore, limitations resulting from the structure of the online format (33.8%) were cited also as negative aspects.

More specifically, participants reported that they often felt jealous when reading of others' successful pregnancy and conversely, they felt discouraged and shared in each others' disappointments, sometimes taking on others' reproductive failures as if they were their own. Some found that reading about others' infertility difficulties heightened their concern about their own reproductive problems, causing them to worry even more than they had before they joined the online group. Contagion of positive or negative emotions appears to occur within the online infertility support groups.

Others stated that they would compulsively check the group postings, which distracted them from their jobs and other relationships with family and friends. One participant stated that "you feel like you will always be online talking about being pregnant instead of being OFFline and being a mother." Some worried about other

consequences of group membership for other aspects of their lives, including whether the groups were truly anonymous and what repercussions might occur if their identities were revealed.

Although most agreed that there was always another group member who could relate to their same experience, the few who stated that the group members could not understand their specific circumstances or minimized those circumstances viewed this as an isolating experience. The structure of the online format made it easy to "get lost in the crowd." A few viewed the groups as impersonal and "faceless," with some going so far as to lament that they could not give group members actual hugs or attend medical appointments with each other.

Responses to these open-ended questions are similar to those found in Malik and Coulson's (2008) qualitative study on women and men's use of online support groups. The same themes of online support group use decreasing isolation and providing members with valuable medical information about their own treatment options were replicated in the current study. Likewise, the current study also found that support group users reported the negative reactions of experiencing grief and distress in response to others' postings and sometimes became preoccupied with the group postings. In short, the use of online infertility support groups offers both positive and negative consequences that members should consider.

Utilization and reliance on online infertility support groups. Women with primary infertility reported that they visit online support groups approximately once every few days whereas women with secondary infertility, on average, visit the groups a little less frequently. Both groups of women perceived the groups as somewhat helpful

and agreed somewhat with the statement that “Internet forums are my primary outlet for discussing infertility.” For women with primary infertility, their frequency of group use correlated positively with negative affect and infertility-related stress and reliance on the groups as their only outlet correlated negatively with life satisfaction at the $p<.05$ level. In other words, the more they reported using the online support groups, the more negative emotions and stress they also reported. Additionally, using online support groups as the primary method for discussing their infertility was associated with less life satisfaction (small effect size). For women with secondary infertility, reliance on the groups as their only outlet related to a medium effect size in increased negative affect, decreased life satisfaction, and increased infertility-related stress and the frequency of use correlated positively with infertility-related stress.

In their study comparing those who relied on internet support as their only outlet (OOs) for discussing infertility with those who had additional outlets (AOs), Epstein et al. (20002) found that OO participants reported more depression, greater levels of anxiety, poorer coping strategies for dealing with their infertility, less satisfaction with “real-world” support, and generally, viewed their infertility as more stressful than their AO counterparts. Many have noted that those who utilize support groups tend to have greater distress and or illness-related concerns that non-users in general (e.g., Berglund et al., 1997; Sherman et al., 2008), and it appears that those levels of distress are heightened even further when group users have no other sources of support. Likewise, the results of the current study also suggest that those who rely on infertility support groups as their main outlets of social support were also experiencing greater levels of distress and lower levels of well-being than those with other “real-world” support systems. Perhaps those

who lack relationships outside of the infertility support groups in which they can openly discuss their difficulties with infertility are especially sensitive to the negative aspects of online support groups, finding that their emotions are as volatile as the threads members post, and fail to benefit as much from the positive aspects of the groups. More research is needed in this area to determine characteristics of individuals who most benefit from online support groups and those who might find them less helpful.

Perceived cause of infertility. Historically, women often were blamed for their infertility, with doctors and psychologists pointing to the women's deficient mental health as the cause. Women who had difficulty conceiving were thought to have psychological issues, such as neuroticism or heightened stress levels, that blocked their ability to become pregnant. Yet with advanced medical technology, the diagnosed cause of infertility shifted from internal psychological causes to biological problems with their reproductive system. The open-ended question of what women believed was the cause of their infertility intended to capture information about the extent to which infertile women have blamed themselves or internalized the historical messages about the cause of their infertility.

Somewhat surprisingly based on the long history of attributing infertility to women's psychological functioning, 81.1% of the participating women attributed their infertility to identified or possible biological or unpreventable medical reasons, such as poor egg quality or thyroid problems. Age also represents one significant biological cause for infertility that is commonly recognized and was a frequently cited cause of infertility in the current sample, as was polycystic ovary syndrome and endometriosis. Largely, these women identified only a biological cause of their infertility without attributing it to

any other cause. More specifically, 81 of the 119 women (68%) who described medical reasons for their infertility did not identify any other cause. The large majority of the sample (86.6% of women with primary infertility and 90.6% of women with secondary infertility) had utilized medical treatment for their infertility. It is possible that those women who received an identified medically diagnosed cause, such as polycystic ovarian syndrome (PCOS), when seeking medical treatment for their infertility do not hypothesize any additional causes of their infertility whereas those whose medical cause of infertility is complicated or uncertain are much more likely to speculate on additional reasons for their infertility. Increased use of more sophisticated medical technology may better allow women to identify a definitive medical cause of their infertility. Or perhaps users of online infertility support groups are more medically oriented or improved consumers of medical research compared to earlier samples of women with infertility. The users of online support group might find that other support group members challenge them to identify "logical" medical causes for their infertility rather than to blame themselves. Hopefully, as the depth and breadth of reproductive medicine advances, fewer women will received unclear infertility diagnoses and thus also, experience less self-blame.

Nineteen women (11%) cited psychological reasons for infertility. Stress and anxiety were the most often cited psychological causes of infertility, and stress continues to be investigated as it relates to infertility. Further, behavioral reasons were cited by 13.4% of participants, including the use of birth control, hormones in the food supply, their weight, past abortions, medications from their childhood, or STDs. A fourth cause was described as an unexplained and uncontrollable reason, with some citing fate or

"God's joke." This fourth category of unknown cause was reported by 22.6% of the participants. This distribution of a little less than 1/4 of the sample reporting unknown causes of infertility was similar to the statistics cited by the American Society for Reproductive Medicine (2009).

In summary, the majority of the sample recognized a biological condition as the causal agent of their infertility, failing to attribute their infertility to a deficit in their own mental health. Yet stress and anxiety also were indicated, and almost a fourth of the participants cited unknown reasons for their infertility. Much continues to remain unknown when diagnosing the cause of infertility, and the lack of knowledge about the cause itself might be stress-provoking and a time when constructs such as self-compassion might be especially relevant.

Effect of infertility on their lives. Participants described a multitude of ways that infertility had had an impact on their lives, and often their responses were heart-wrenching. The large majority of respondents (81%) cited emotional or mental health effects of their infertility experience, and nearly half (48%) noted ways that infertility had affected their relationships with others. One fifth of the sample described how infertility had affected their daily life decisions and functioning about such things as planning their finances or vacations, whereas 13% described how infertility had changed the way that they think about or experience their body. Over 70% reported that infertility had affected them negatively, and only 4% reported that infertility had affected their lives in a positive manner. Almost 20% described both positive and negative effects of their infertility experience.

The large majority (67%) of those reporting changes in their mental health functioning described specific emotions, such as depression, anxiety, anger, sadness, and grief. They stated that infertility had "taken all the joy out of my life and replaced it with stress. Every month that I don't get pregnant kills a little part of me." Another woman responded that, "It has left me empty. I feel like a barren waste of a woman every second of the day." One fifth of women reporting changes in their emotional health due to infertility, also described changes in their identity and they way that they think of themselves, stating that their identities as women have changed and that they now feel "different." Their self-esteem had been affected as they struggle to make sense of their infertility. Further, twenty percent of women reported changes in their spiritual lives, such as having to trust God's plan for their lives and finding that they pray more as a result of their infertility experience.

Interpersonal changes due to the infertility experience were prevalent in nearly half of responses (48%). The largest reported changes occurred in interactions with family and friends, and changes in their relationship with their partner also described frequently. As noted in prior research (e.g., Jirka, Schuett, & Foxall, 1996; Lasker & Borg, 1987) , infertility holds the potential to affect the structure and utilization of social support systems, such that those systems that previously provided the foundation of support now often are the systems that cause the most stress and pain. This finding was reflected in participants' responses such as they feel as if they were treated as "second rate" by their families because they do not have children and as if they were "drifting apart" from their family and friends. A few noted that their partners did not fully understand why they wanted to have a child so badly, and that infertility had interrupted

their sex life with their partner. Others told of how difficult it was for them to watch strangers treat their children badly in public, in essence taking their children for granted, when the participants were struggling so much to have children to cherish. In short, to understand the impact of infertility, it is important to address not only its effects on the mental health of women, but also the impact it has had on their interactions and relationships with others.

The other two areas of infertility effects, bodily changes and daily life functioning changes, were less prevalent in responses. A small percentage mentioned feeling as if they had been "betrayed" by their bodies, but these responses typically related more to their identity as women and their self-esteem rather than to their biological functioning. A few others noted the invasiveness of the medical procedures to treat their infertility, but this was a secondary concern; responses indicated that they were willing to undergo the pain and lack of privacy inherent in infertility treatment if such experiences would help them achieve their goal of having a child. A small percentage (5%) specifically cited the financial cost of infertility treatment, but this was often then linked to emotional effects such as stress and marital strain. The most often cited aspect of daily life functioning involved the inability to make future plans because their infertility made their lives feel uncertain; they refrained from planning for vacations, buying houses, or beginning new jobs because they wanted to leave open the possibility that they might become pregnant.

Largely, these effects of infertility were considered negative changes. But participants were more likely to describe both positive and negative changes due to certain effects of infertility. More specifically, both positive and negative effects were reported in the area of spirituality, which was mentioned by 20% of responses coded in

the mental health effects category, and in the area of relationship changes, which was mentioned in 48% of all responses. As one woman explained, infertility:

> has changed my relationships with everyone. I'm closer to my husband, cherish my time with the children I do have even more, am less inclined to gossip about other's personal business and less inclined to have close friendships with other women. Infertility has forced me to dig deep to my spiritual roots too and develop my relationship with God better. It has taught me to be sensitive to others' difficulties. It has forced me to redefine who I am and what I want in life.

Although infertility can be a devastating experience for many people, it can also represent a time of self-evaluation as well as hold the potential for benefit-finding and growth.

The negative effects of infertility on women's emotional well-being and their interpersonal relationships are well-documented (e.g., Burns & Covington, 2006; Greil, 1997). Yet the responses to this open-ended question about the impact of infertility on the women's lives also raised the question of what positive effects occur when experiencing infertility. Perhaps an even more important question worthy of exploration is what distinguishes women who report positive effects from those who report only negative effects. Future research could explore whether variables such as self-compassion and hope are two such factors in what distinguishes those who see positive effects from those who report only negative effects.

Overall Summary of Findings

The biopsychosocial model originally was presented to conceptualize the relationship between the many variables presented in this study, and is useful for

understanding the implications of this study's multitude of findings. The biological variable of infertility type failed to be significant in predicting levels of subjective well-being and infertility-related stress. Both women with primary infertility and women with secondary infertility reported experiencing significant levels of distress and negatively impacted well-being; both types of infertility were connected to decreased adjustment. This finding implies that both types of infertility are related to distress, and that in general, one type of infertility is not "easier" than the other in terms of distress and adjustment.

In contrast, the psychological variables examined revealed different ways of relating to distress for the current sample. The relevance of self-compassion with well-being and stress variables was not connected to infertility type; self-compassion consistently was important in understanding the adjustment of women with both types of infertility. Thus, self-compassion is a psychological construct deserving of further exploration in relation to infertility and could be incorporated into further interventions aimed at improving the adjustment of women with primary as well as secondary infertility.

The relationship between hope with well-being and distress appeared to be more complicated. For women with secondary infertility, hope failed to relate to negate affect but the difference in the correlation between hope and negative affect was not significant for the two groups of women. Perhaps the failure to find significance in the relation between hope and negative affect for women with secondary infertility was simply a by-product of the smaller secondary sample size. However, the differences in the relation between hope and infertility-related stress depending on infertility type cannot be

explained away by differences in sample size. Hope and infertility type interacted in relation to infertility-related stress such that higher levels of hope related to lower levels of infertility-related stress for women with primary infertility but not for women with secondary infertility. Snyder (2002) proposed that hope represents a cognitive set in which emotions play a secondary role. Perhaps infertility-related stress is a by-product of emotional functioning rather than of cognitive adjustment to stressors for women with secondary infertility. However, this does not address why hope functions differently in relation to stress for women depending on their infertility type.

The complexity of the interaction between biological and psychological variables was further illuminated in the mediation of the relationship between hope and positive and negative affect by self-compassion. If hope represents a cognitive set with emotions as secondary, it might be expected that hope's relationship with measurements of emotions, such as positive and negative affect, might be weaker than its relationship with measurements of cognitive assessments of well-being, such as life satisfaction. Furthermore, self-compassion has been presented as a form of emotion-regulation or emotion-focused coping (Neff, 2003a) helpful when confronting a chronic stressor. It is plausible that a cognitive strategy such as hope relates to levels of affect through its connection to an emotion-focused coping skill such as self-compassion.

The social variables explored in this study related to the use of online infertility support groups. Participants' responses replicated previous findings that some of the most beneficial aspects of such a support group were its ability to normalize feelings, its 24/7 accessibility, and the quantity and quality of information that it provided. Similarly, the same negative aspects of online infertility support groups were described in this study as

found in previous studies: the arousal of feelings of jealousy, of compulsivity in visiting the online forums, and of feeling disconnected from the "real" world. Further, increased frequency of use of online infertility support groups related to increased negative affect and fertility-related stress. Those who reported greater reliance on online infertility forums to discuss their infertility reported less life satisfaction and overall subjective well-being as well as increased negative affect and infertility-related stress. The use of online infertility support groups has identifiable benefits, but overreliance and excessive use also relates to lowered well-being and increased distress. Ideally, users of these support groups will be able to find a balance between use of the online groups and use of other social outlets for support.

In summary, for women with both primary and secondary infertility, the relationship between biological, psychological, and social variables is complex and interactional. As presented in the concentric biopsychosocial model of health (Hoffman & Driscoll, 2000), psychological variables and psychosocial contributors, such as hope, self-compassion, and online social support, are important for capturing a complete picture of people's health above and beyond that presented in biomedical factors such as infertility type. Additionally, this study contributes to infertility research by using the concentric biopsychosocial model to highlight variables that relate to positive components of adjustment (Hoffman, 2000).

Limitations

This thesis proposal has several limitations. The primary limitation was the sampling method. Traditional infertility research has been conducted using samples from infertility clinics and local support groups. Yet, the majority of women with secondary

infertility does not actively seek treatment at clinics nor participate in local support groups. Reaching the secondary infertility population is a difficult but important task. Internet research offers one possibility for contact with this group, but Internet research's inherent issues with reliability, validity, and generalizability need to be acknowledged openly. Difficulties obtaining a response rate and potential respondent bias are two such problems with Internet research. For instance, a self-selection bias among the participants existed if only those who are high in self-compassion, hope, or distress choose to complete the survey. In addition, the representativeness of the sample was limited to those who are searching for online support to help them with their infertility experiences. Although prior research has demonstrated that over half of infertility patients utilize the Internet for infertility-related purposes (Kahlor & Mackert, 2009; Rawal & Haddad, 2006), the generalizability of the current study to the broader infertility population is restricted.

The generalizability of this study is limited also because it utilized only a sample of women, rather than of men and/or couples. Women are presumed to have higher levels of distress surrounding issues of infertility in comparison to men, except in the case of male-factor infertility. But perhaps the traditional distress measures used in infertility research are more sensitive to women's expression of distress than to men's; it is possible that infertility adjustment instruments are not sensitive to men's experiences (Newton et al., 1999). Unfortunately, it was not feasible to explore these ideas in this thesis project.

The cross-sectional design of this thesis project also represented a limitation. The results of this study may have been affected by whether participants were actively seeking infertility treatment and if so, where they were in the treatment process when

completing this survey. The demographic and treatment history questions attempted to capture pertinent information related to this issue. An additional limit of the cross-sectional design is the ability to make causal statements and to easily establish moderation and mediation. Longitudinal research and the use of multiple comparison groups (e.g., women not experiencing infertility), which is beyond the scope of this project, is needed to capture more fully the relationships between infertility and well-being.

Implications for Research

This study's greatest research implication was its demonstration of the relevance of studying positive psychological constructs for understanding the well-being of women experiencing infertility by adopting a more complex view of infertility that goes beyond its mere biological effects. Although a wide range of studies have addressed infertility's impact on negative aspects of functioning, such as depression and anxiety, few studies have explored how infertility relates to positive aspects of functioning. It has been establishing that positive functioning is more than the absence of negative variables just has it has been established that health is more than the absence of disease. The current study increases our knowledge of how the experience of infertility is connected to cognitive and emotional aspects of well-being, and introduces the constructs of self-compassion and hope as relevant and important positive psychological variables worthy of further exploration in women with primary and secondary infertility. Despite experiencing a difficult health situation such as infertility, hope and self-compassion can be related to positive outcomes.

Furthermore, previous infertility studies that have addressed positive functioning have failed to implement well-validated and widely used assessments such as Diener et al's (1985) measure of life satisfaction and Watson et al.'s (1988) Positive and Negative Affect Schedule. By utilizing empirically-established measures of subjective well-being, this study intended to further the ability to draw meaningful comparisons of well-being across studies utilizing the same constructs and assessments. Having demonstrated the significant stress and lowered well-being reported by women with primary and secondary infertility, this study aims to encourage future research to investigate other relevant variables to improving adjustment to infertility.

Although the current study utilized the concentric biopsychosocial framework, it did not attempt to fully test this model. More specifically, the current study did not test the biopsychosocial model's tenet that psychosocial contributors mediate the relationship between biomedical conditions and health status. Now that the current study has established that hope and self-compassion are relevant variables worthy of study with infertile populations, future research can explore whether these psychological variables mediate the relationship between infertility and well-being. By using a control group of women who are not experiencing infertility in addition to multiple groups of women with different types of infertility (e.g., primary), future research more directly could use longitudinal designs to assess whether psychological variables serve as a mediator. In short, the current study represents a first step towards moving beyond the medical model to integrate attributes of positive functioning in our understanding of infertility adjustment.

More specifically, this study identified that self-compassion related to the well-being and distress of women with both primary and secondary infertility but that hope's relationship with stress varied depending on infertility type. More research is needed to explore infertility type's role as a moderator on the relationship between positive psychological variables such as hope and stress measures. The current dearth of research on moderators of hope and the even greater absence of research on hope in relation to infertility makes it difficult to speculate as to why this moderation occurred. Future research could explore how hope functions differently under various conditions to help determine when its presence is most beneficial for those experiencing medical conditions.

Additionally, more research is needed to examine the relationship between self-compassion and hope. Although they correlate in the range of .60, they have been conceptualized as two distinct constructs that are related closely but work differently. The current study provided further evidence of the distinction between the two constructs by demonstrating that self-compassion mediated the relationship between hope and positive and negative affect for women with primary infertility. But future research is needed to untangle their relationship and to understand how they relate to one another, how they differentially affect various outcomes, and under what conditions they affect various outcomes.

Future research is also needed using more diverse samples of women experiencing infertility to extend the current findings beyond women using online infertility support groups. Future studies could survey men, couples, or more diverse samples in terms of race, educational background, or country of origin. It would also be interesting to explore how the experience of infertility relates to sexual orientation, such

as whether the experience of infertility differs for same-sex couples compared to heterosexual couples. Although the use of internet research has inherent limitations, it allows researchers to access difficult-to-reach populations, such as women with secondary infertility and participations from a broader geographical area. The advantages of the online format along with the increasingly widespread use of online social support networks exemplify the importance of improving and expanding this type of research in future studies.

Implications for Practice

Nearly twenty years ago, Domar et al. (1990) developed a mind/body program for women with infertility that included the concepts of self-empathy and compassion. More recently developed interventions have taught infertile women meditation techniques that highlighted the importance of mindfulness (Chan et al., 2006). The current study provided further support for incorporating the concept of self-compassion in interventions directed at improving the adjustment of women with both primary and secondary infertility. Specifically, self-compassion could be presented as an emotion-focused coping strategy that does not over-activate emotions and therefore, allows for an effective response to coping with the chronic stressor of infertility without over-activating the stress-related biological systems involved. Self-compassion could represent an emotion regulation strategy that allows women to work through their feelings without becoming consumed by them or allowing them to impact their fertility negatively.

Based on the current study's findings, hope also appears to be a relevant cognitive framework for women with infertility. Hope appears to be most relevant for women with primary infertility, and interventions specially designed for this type of infertility could

outline the general tenets of hope theory. Such an explanation of hope theory might help women identify what aspects of their pathway and agency are affected by their infertility experience, hopefully allowing them to also identify solutions. However, these implications for practice are tentative at best because the current study was only exploratory and not an intervention study. Additional research is needed on the effectiveness of interventions incorporating self-compassion and hope.

Based on this study's findings regarding online infertility support groups, a moderate amount of reliance on online infertility support groups related to positive adjustment. Having identifiable outlets for discussing one's infertility, outside of the online support group format, related to increased well-being and lowered distress. Practitioners working with women with infertility could make them aware of the online infertility support groups available, but advise that they also should access other sources of social support to avoid the negative consequences of online support group use. Practitioners can also increase their knowledge of which sites are most frequently used to help monitor the accuracy of information provided and to help set guidelines (e.g., netiquette) to make the use of online social support a positive experience for participants. Ideally, in conjunction with online support groups, a multitude of other social support sources will help women best adjust to their experiences with infertility.

In summary, this correlational study demonstrated significant relationships between positive psychological variables of self-compassion and hope for the well-being and distress of women experiencing primary and secondary infertility who utilized online infertility support groups. The moderation and mediation analyses indicate a complex relationship between these psychological variables and the medical condition of

infertility, and future research is needed to better identify the causal factors. Future research that demonstrates causal relationships then can be used to better inform interventions. Nonetheless, the current study highlighted the need to move beyond the medical model when understanding adjustment to a health condition such as infertility. In addition to examining how infertility relates to negative outcomes such as depression and anxiety, it is also important to understand how it relates to positive aspects of functioning such as life satisfaction and positive affect. The use of open-ended questions allowed participants to describe those positive aspects in their own words, such as by noting that "I am more aware of my marriage and how much it means to me so we are constantly checking in and working on our marriage to keep it strong through the struggles. I believe I am more compassionate towards other and conscious of my words and actions." In short, this study helped contribute to a greater awareness of the multifaceted dimensions of experiencing infertility, including psychological factors such as self-compassion and hope that can help women cope as they face difficult medical conditions.

Appendix A

List of Online Support Groups for Participant Recruitment

Infertility (General)

Daily Strength Infertility Support Group
4002 Members
(http://dailystrength.org/c/Infertility/support-group)

Daily Strength Trying to Conceive Support Group
262 Members
(http://www.dailystrength.org/c/Trying-To-Conceive/support-group)

Infertility Network
http://health.groups.yahoo.com/group/InfertilityNetwork/?v=1&t=search&ch=web&pub=group&sec=group&slk=1

The InterNational Council on Infertility Information Dissemination, Inc.
http://www.inciid.org/forum

Secondary Infertility

Daily Strength Secondary Infertility Support Group
251 members
http://dailystrength.org/c/Secondary-Infertility/support-group

Yahoo Groups Secondary Infertility
http://groups.yahoo.com/group/secondary-if

Appendix B

Recruitment Posting

Announcement for General Infertility Support Groups
Do you wish others had a better understanding of what it is like for you to struggle with infertility? My name is Trisha Raque-Bogdan, and I am a doctoral student in counseling psychology at the University of Maryland. If you have been struggling to become pregnant for at least 12 months, PLEASE consider completing a questionnaire designed to explore women's unique experiences with infertility.

Your participation will help researchers interested in understanding more about the challenges of infertility, as well as about the strength and resilience shown by women who experience infertility. It might also be interesting for you as you reflect on some of your responses to the questions!

Participants can enter a drawing to win a $100 gift certificate to spafinder.com, redeemable at thousands of locations throughout the country!

The questionnaire should take you about 20-30 minutes to complete and can be accessed by visiting the following web site:

Thank you for your time and consideration.

Trisha Raque-Bogdan, M.S.
Doctoral Student, Counseling Psychology
University of Maryland, College Park
tlraque@umd.edu

Mary Ann Hoffman, Ph.D.
Professor, Counseling Psychology
University of Maryland, College Park
hoffmanm@umd.edu

Announcement for Secondary Infertility Support Groups

Do you wish others had a better understanding of what it is like for you to struggle with infertility? My name is Trisha Raque-Bogdan, and I am a doctoral student in counseling psychology at the University of Maryland. If you have been struggling to become pregnant for at least 12 months, PLEASE consider completing a questionnaire designed to explore women's unique experiences with infertility.

Your participation will help researchers interested in understanding more about the challenges unique to secondary infertility, as well as about the strength and resilience shown by women who experience secondary infertility. It might also be interesting for you as you reflect on some of your responses to the questions!

Participants can enter a drawing to win a $100 gift certificate to spafinder.com, redeemable at thousands of locations throughout the country!

The questionnaire should take you about 20-30 minutes to complete and can be accessed by visiting the following web site:

Thank you for your time and consideration.

Trisha Raque-Bogdan, M.S.
Doctoral Student, Counseling Psychology
University of Maryland, College Park
tlraque@umd.edu

Mary Ann Hoffman, Ph.D.
Professor, Counseling Psychology
University of Maryland, College Park
hoffmanm@umd.edu

Appendix C

Informed Consent

This is a research project being conducted by Mary Ann Hoffman and Trisha Raque-Bogdan at the University of Maryland, College Park. We are interested in your responses to this survey because you are a woman over the age of 18 who has experienced infertility. The purpose of this study is to learn more about the unique experiences of women dealing with infertility.

The procedure entails completing an online survey, which will take about 20-30 minutes. You will be asked questions about your feelings over the past week, your feelings about how you think about yourself, your feelings about your infertility-related experiences, your feelings about your future, and your use of an infertility-specific online support group.

The survey does not ask for identifying information, and the confidentiality of your answers will be protected as best as possible. Due to the public nature of the Internet, absolute confidentiality cannot be promised. The likelihood of someone accessing your data is very improbable but a theoretical possibility. Be sure to exit or close your Internet browser when you have completed the survey to ensure that another person using that same computer cannot see your responses.

The main possible risk from participating in this survey is that the questions might elicit negative emotions (e.g., sadness about your infertility diagnosis).

Although this research is not intended to benefit you directly, its findings will help the investigators learn more about the unique strengths and challenges faced by women experiencing infertility. Your responses will be contributing to research on an important area of study.

Your participation in this survey is completely voluntary. You may ask questions or withdraw from survey participation at any time without penalty.

If you have any questions about the research study, please contact:

Mary Ann Hoffman, Ph.D. or Trisha Raque-Bogdan, M.S.
University of Maryland
Counseling and Personnel Services
3222 Benjamin Building
College Park, MD 20742
Phone: 301.405.2865.
Email: hoffmanm@umd.edu, tlraque@umd.edu

If you have questions about your rights as a research subject or wish to report a research-related injury, please contact: Institutional Review Board Office, University of Maryland, College Park, MD, 20742.
Phone: 301-405-0678
Email: irb@deans.umd.edu
This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.
By clicking "I Accept" you acknowledge that:
You are at least 18 years of age
The research has been explained to you
Your questions have been fully answered; and
You freely and voluntarily choose to participate in this research project.

I Accept
I Do Not Accept

Appendix D

Demographics

Please answer the following questions about yourself. All responses are anonymous and confidential.

1. What is your country of residence? _____

2. What is your age? _____

3. What is your racial/ethnic background? (Mark all that apply)
_____African-American/Black
_____Asian-American/Pacific Islander
_____Asian-Indian/Pakistani
_____Biracial/Multiracial
_____Hispanic/Latino(a)
_____Middle Eastern/Arab
_____Native American/Native Alaskan
_____White/European American
_____Foreign National (please specify):_____
_____Other (please specify):_____

4. What is your highest level of education completed?
_____ Grade school _____ College
_____ High School _____ Graduate School
_____ Other

5. What is your employment status?
Not employed_____ Employed part-time_____
Employed full-time____ Student_____

6. What is your annual household income (before taxes)?
_____Less than 30,000
_____30,000-59,999,
_____60,000-99,999
_____100,000-149,999
_____150,000 or higher

7. Please indicate your sexual orientation:
_____Bisexual
_____Heterosexual
_____Homosexual
_____Pansexual
_____Other, please specify: _____:

8. What is your relationship status?
_____Married
_____Remarried (How many times? _____)
_____Engaged
_____Co-Habitating with partner of ____ years
_____Single

9. Please indicate the number of years that you have been in your current relationship (round to the nearest year):_____ Years

10. Are there any children or adolescents currently in your home on a full-time basis?___

If yes, please indicate their relationship to you and their age:

Relationship	Age
example: stepson	5 years old

11. What do you believe is the cause of your infertility:
_____

12. Which type of infertility have you been diagnosed with formally? (Check one only)
_____ Primary Infertility
_____Secondary Infertility

13. What is the medically diagnosed cause of your fertility problem? (Check one only)
_____ Male factor
_____Female factor
_____Combined male-female factor
_____Unexplained cause
_____Other, please specify:_____

14. Who provided your infertility diagnosis?
_____Infertility specialist
_____Gynecologist/Obstetrician
_____General Practitioner
_____Self-Diagnosis
_____Other, please specify: _____

15. How long have you been trying to become pregnant? _____

16. Have you utilized medical services as part of your infertility treatment? (yes/no)____

If no, please skip to question #18

17. If yes, please indicate how you are paying for your infertility treatment: (Check one only)
_____ Insurance covers all cost
_____Insurance plus out-of-pocket payment
_____No insurance, all out-of-pocket
_____Other, please specify: _____

18. How long have you been pursuing infertility treatment from your current and/or previous infertility physicians?
_____

19. What type of treatments have you pursued? (Check all that apply)
_____Intracervical insemination (ICI)
_____IVF
_____Endometrial surgery
_____Surgery to repair a septum
_____Fibroid surgery

_____Tubal surgery
_____Donor eggs
_____Donor sperm
_____ Gamete Intrafallopian Transfer (GIFT)
_____ICSI
_____Ovulation induction medication (e.g., FSH, Clomid, HCG)
_____IUI
_____Zygote intrafallopian transfer (ZIFT)
_____Surrogate or gestational carrier
_____Assisted hatching
_____Cytoplasmic transfer
_____Laparoscopy
_____Immunotherapy
_____Acupuncture
_____Meditation

20. Have you ever been pregnant? (yes/no) _____

21. If yes, what was the outcome? (Indicate the number of times you've had each outcome)
_____Miscarriage
_____Ectopic pregnancy
_____Abortion
_____Live birth
_____Stillbirth
_____Other

22. Have you adopted? (yes/no) _____

23. If yes, how many children have you adopted and what were their ages at time of adoption?_____

24. What is the name(s) of the online infertility-specific support group that you use?
_____

25. On average, how often do you visit online infertility support groups?
_____One time every two weeks or less
_____Once each week
_____Once every few days

_____Once a day
_____Several times a day

26. How much do you agree with the following statement:
Internet forums are my primary outlet for talking about infertility.
_____Strongly agree
_____Agree somewhat
_____Uncertain
_____Disagree somewhat
_____Strongly disagree

27. How helpful would you rate your use of an infertility online support group?
_____Very helpful
_____Somewhat helpful
_____No opinion
_____Not very helpful
_____Not at all helpful

28. What is the best thing about using an online infertility support group?

_____

29. What is the worst thing about using an online infertility support group?

_____

30.. How did you find out about this study?

_____

Appendix E

Self-Compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.

_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.

_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.

_____ 5. I try to be loving towards myself when I'm feeling emotional pain.

_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.

_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.

_____ 8. When times are really difficult, I tend to be tough on myself.

_____ 9. When something upsets me I try to keep my emotions in balance.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.

_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

Almost never				Almost always
1	2	3	4	5

_____ 14. When something painful happens I try to take a balanced view of the situation.

_____ 15. I try to see my failings as part of the human condition.

_____ 16. When I see aspects of myself that I don't like, I get down on myself.

_____ 17. When I fail at something important to me I try to keep things in perspective.

_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.

_____ 19. I'm kind to myself when I'm experiencing suffering.

_____ 20. When something upsets me I get carried away with my feelings.

_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.

_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.

_____ 23. I'm tolerant of my own flaws and inadequacies.

_____ 24. When something painful happens I tend to blow the incident out of proportion.

_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.

_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Neff, K. D. (2003). Development and validation of a scale to measure self-compassion. *Self and Identity, 2, 223-250.*

Coding Key:

Self-Kindness Items: 5, 12, 19, 23, 26
Self-Judgment Items (reverse scored): 1, 8, 11, 16, 21
Common Humanity Items: 3, 7, 10, 15
Isolation Items (reverse scored): 4, 13, 18, 25
Mindfulness Items: 9, 14, 17, 22
Over-identified Items (reverse scored): 2, 6, 20, 24

To compute a total self-compassion score, take the mean of each subscale, then compute a total mean. (This method of calculating the total score is slightly different than that used in the article referenced below, in which each subscale was added together. However, Neff finds it easier to interpret the scores if the total mean is used.)

Appendix F
The Trait Hope Scale

Directions: Please read each item carefully. Using the scale shown below, please select the number that best describes YOU and put that number in the blank provided.

1 Definitely false
2 Mostly false
3 Somewhat false
4 Slightly false
5 Slightly true
6 Somewhat true
7 Mostly true
8 Definitely true

_____ 1. I can think of many ways to get out of a jam.

_____ 2. I energetically pursue my goals

_____ 3. I feel tired most of the time.

_____ 4. There are lots of ways around any problem.

_____ 5. I am easily downed in an argument.

_____ 6. I can think of many ways to get the things in life that are important to me.

_____ 7. I worry about my health.

_____ 8. Even when others get discouraged, I know I can find a way to solve the problem.

_____ 9. My past experiences have prepared me well for my future.

_____ 10. I've been pretty successful in life.

_____ 11. I usually find myself worrying about something.

_____ 12. I meet the goals that I set for myself.

Notes: When administering the scale, it is called "The Future Scale." The Agency subscale score is derived by summing items #2, 9, 10, and 12; the Pathway subscale score is derived by adding items #1, 4, 6, and 8. The total Hope Scale score is derived by summing the four Agency and the four Pathway items.

Appendix G

Satisfaction with Life Scale

Directions: Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item. Please be open and honest in your responding.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ In most ways my life is close to my ideal.

____ The conditions of my life are excellent.

____ I am satisfied with my life.

____ So far I have gotten the important things I want in life.

____ If I could live my life over, I would change almost nothing.

- 31 - 35 Extremely satisfied
- 26 - 30 Satisfied
- 21 - 25 Slightly satisfied
- 20 Neutral
- 15 - 19 Slightly dissatisfied
- 10 - 14 Dissatisfied
- 5 - 9 Extremely dissatisfied

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*, 71-75.

Appendix H

Positive and Negative Affect Schedule (PANAS)

Directions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you have felt this way during the past week.

Use the following scale to record your answers.

(1) = Very slightly or not at all (2) = A little (3) = Moderately (4) = Quite a bit (5) = Extremely

	Very slightly or not at all	**A little**	**Moderately**	**Quite a bit**	**Extremely**
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5

11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Watson, D., Clark, L.A., Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*, 1063-70.

Appendix I

Fertility Problem Inventory

Directions: 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. If you have a child, please answer the way you feel **right now**, **after** having a child.

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

1. ___ Couples without a child are just as happy as those with children.

2. ___ Pregnancy and childbirth are the two most important events in a couple's relationship.

3. ___ I find I've lost my enjoyment of sex because of the fertility problem.

4. ___ I feel just as attractive to my partner as before.

5. ___ For me, being a parent is a more important goal than having a satisfying career.

6. ___ My marriage needs a child (or another child).

7. ___ I don't feel any different from other members of my sex.

8. ___ It's hard to feel like a true adult until you have a child.

9. ___ It doesn't bother me when I'm asked questions about children.

10. ___ A future without a child (or another child) would frighten me.

11. ___ I can't show my partner how I feel because it will make him/her feel upset.

12. ___ Family don't seem to treat us any differently.

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

13. ___ I feel like I've failed at sex.

14. ___ The holidays are especially difficult for me.

15. ___ I could see a number of advantages if we didn't have a child (or another child).

16. ___ My partner doesn't understand the way the fertility problem affects me.

17. ___ During sex, all I can think about is wanting a child (or another child).

18. ___ My partner and I work well together handling questions about our infertility.

19. ___ I feel empty because of our fertility problem.

20. ___ I could visualize a happy life together, without a child (or another child).

21. ___ It bothers me that my partner reacts differently to the problem.

22. ___ Having sex is difficult because I don't want another disappointment.

23. ___ Having a child (or another child) is not the major focus of my life.

24. ___ My partner is quite disappointed with me.

25. ___ At times, I seriously wonder if I want a child (or another child).

26. ___ My partner and I could talk more openly with each other about our fertility problem.

27. ___ Family get-togethers are especially difficult for me.

28. ___ Not having a child (or another child) would allow me time to do other satisfying things.

29. ___ I have often felt that I was born to be a parent.

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

30. ___ I can't help comparing myself with friends who have children.

31. ___ Having a child (or another child) is not necessary for my happiness.

32. ___ If we miss a critical day to have sex, I can feel quite angry.

33. ___ I couldn't imagine us ever separating because of this.

34. ___ As long as I can remember, I've wanted to be a parent.

35. ___ I still have lots in common with friends who have children.

36. ___ When we try to talk about our fertility problem, it seems to lead to an argument.

37. ___ Sometimes I feel so much pressure, that having sex becomes difficult.

38. ___ We could have a long, happy relationship without a child (or another child)

39. ___ I find it hard to spend time with friends who have young children.

40. ___ When I see families with children I feel left out.

41. ___ There is a certain freedom without children that appeals to me.

42. ___ I will do just about anything to have a child (or another child).

43. ___ I feel like friends or family are leaving us behind.

44. ___ It doesn't bother me when others talk about their children.

45. ___ Because of infertility, I worry that my partner and I are drifting apart.

46. ___ When we talk about our fertility problem, my partner seems comforted by my comments.

Scoring: 1. Positively phrased items* are first re-keyed as follows; (6=1, 5=2, 4=3, 3=4, 2=5, 1=6)

2. Subscale scores are derived by summing raw scores for items in each subscale.

3. Global Stress is calculated by summing all items (or all 5 subscale scores)

1. *Social Concern* (10 ITEMS)

High Score: Sensitivity to reminders, comments, questions about infertility. Feelings of alienation or isolation from peers, family, finding social activities difficult.

Items (*9, *12, 14, 27, 30, *35, 39, 40, 43, *44)

2. *Sexual Concern* (8 ITEMS)

High Score: Loss of enjoyment of sexual relations, feelings of pressure to schedule sex, loss of sexual self-esteem

Items (3, *4, *7, 13, 17, 22, 32, 37)

3. *Relationship Concern* (10 ITEMS)

High Score: Problems in communicating openly or constructively about infertility, difficulty accepting gender differences, concerns about the future of the relationship

Items (11, 16, *18, 21, 24, 26, *33, 36, 45, *46)

4. *Rejection of Childfree Lifestyle* (8 items)

High Score: Negative view of childfree lifestyle or status quo. Future happiness dependent on having a child (or another child) Difficulty perceiving other roles as satisfying/fulfilling

Items (*1, *15, *20, *25, *28, *31, *38, *41,)

5. *Need For Parenthood* (10 items)

High Score: Close identification with the role of parent, parenthood primary or essential life goal

Items (2, 5, 6, 8, 10, 19, *23, 29, 34, 42)

6. *Global Stress* (All 46 items)

High Score: High level of infertility-related stress, psychological stress in comparison to other same sex individuals dealing with infertility.

FPI NORMS

	Males		Females	
	Mean	SD	Mean	SD
Social Concern	22.1	9.3	27.6	11.0
Sexual Concern	14.6	5.9	18.4	7.9
Relationship Concern	19.6	7.9	21.6	9.3
Rej. Childfree Lifestyle	26.4	7.7	27.3	8.2
Need for Parenthood	33.9	10.0	39.2	9.8
Global Stress	117.0	29.3	134.4	33.8
	N=1149		N=1153	

Raw Scores As Percentiles - Women

	16%ile	50%ile	84%ile	98%ile
Social Concern	15	26	39	50
Sexual Concern	10	17	27	37
Relationship Concern	12	19	31	43
Rej.Childfree Lifestyle	18	26	36	44
Need For Parenthood	28	39	49	56
Global Stress	97	132	167	204

High Score: Indicates that the individual is experiencing more psychological stress than the average individual seen for infertility treatment.

Interpretation:

Below 16 % percentile	Low stress
16-84 % percentile	Average stress
85-98 % percentile	Moderately High Stress
Above 98% percentile	Very High stress

Appendix J

Open-Ended Questions

1. What is the best thing about using an online infertility support group?

2. What is the worst thing about using an online infertility support group?

3. What do you believe is the cause of your infertility?

4. How has infertility most affected your life?

Appendix K

Debriefing Form

Thank you very much for participating in this study.
Previous research on women experiencing infertility primarily has focused on how infertility negatively impacts women's lives. Undoubtedly, infertility can create enormous stress and pain for some women, which should not be underestimated. But more research is needed on the strength and resilience of women who face infertility, and what protects them against the negative effects of infertility. The purpose of this study was to explore how levels of self-compassion and hope relate to the well-being and adjustment of women experiencing infertility. Further, this study aimed to explore the unique experiences of women with different types of infertility, thereby contributing to our knowledge of how the experiences of women with primary and secondary infertility compare.

Please be assured that your responses to the survey will be held in strict confidence, which will not be violated under any circumstances. We ask you not to discuss this survey with anyone because we are still recruiting others for participation. This is important to protect the study's validity.

If you would like further information on how to cope with infertility, please visit the website of RESOLVE: The National Infertility Association (http://www.resolve.org). If you are interested in locating a psychologist to discuss any of the concerns that may have arisen for you while completing this questionnaire, please visit http://helping.apa.org/ or call 1-800-964-2000.
Please contact us if you have any questions or concerns about your participation in this study. We appreciate your time and effort in assisting us with this important study.

Sincerely,

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