

**An investigation into men's cognitive appraisals, coping strategies
adopted and adjustment to infertility**

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Abstract

This study employs a stress and coping framework to examine cognitive appraisals of infertility, coping strategies adopted and adjustment (distress and well-being) in 147 men in infertile couples seeking treatment, irrespective of diagnosis. A comparison design is employed to determine the impact of the location of diagnosis, specifically investigating the differences between 42 men with a male factor fertility problem (MMF) and 47 men with a female factor problem (MFF). Men rated their primary appraisals threat, challenge and loss, and secondary appraisals personal control and control connected with infertility, completed a coping questionnaire and measures of global and infertility-specific distress and well-being. Men appraised their infertility as harmful in some ways, and challenging in others and as relatively controllable. Problem focused coping strategies were frequently used. Approximately one third of the sample experienced high levels of global distress, although overall they reported good levels of psychological well-being. No significant differences were observed between MMF and MFF in their cognitive appraisal of infertility and levels of adjustment. Appraisals of infertility in terms of threat and loss were associated with distress and high perceptions of control with well-being. Compared with MMF, MFF were significantly more likely to cope through seeking instrumental social support and mental disengagement. Multiple regression analyses revealed that appraising infertility as a threat and focusing on and venting of emotions were associated with more distress for MMF. For MFF a wider range of appraisals and coping styles were associated with distress including, threat, loss, personal control, focus on and venting of emotions; those who used active coping were less distressed. Directions for further research and clinical implications of the findings are discussed.

1. Introduction

1.1 Overview

Infertility is clearly an issue that affects both members of a couple. Until recently, however, little research or clinical effort was directed towards understanding the males' experience of infertility. The traditional assumptions that infertility is predominantly a female problem and that women are more distressed by it than men are being challenged. Substantially more research has been devoted to understanding women's experience of dealing with infertility. For example, a psychology literature search, as part of this research, revealed that there are currently 264 articles on women and infertility and only 94 including men in the understanding of infertility. However, male experiences of infertility are now being given greater importance. Research is beginning to consider the experiences of men as well as the infertile couple more fully. The limited research in this area has identified that men are undoubtedly distressed by the experience of infertility (e.g. Band et al, 1998; Glover et al, 1996a). Evidently a greater understanding is required of their responses to and emotions about infertility. Some of the research has attempted to incorporate medical diagnoses into their studies, but often male infertility has been under represented. It is becoming clear that it is particularly important to take into account the medical cause of infertility and with which partner it is located (e.g. Berg, 1994; Nachtigall, 1992).

Contemporary research concerning men's experiences and responses to infertility puts forward a number of findings to explain why it is upsetting and stressful. For

instance, some writers have examined distress (e.g. Boivin et al, 1998), whilst others are beginning to concentrate on men's coping strategies and the effect they have on overall well-being and adjustment (e.g. Hurst et al, 1999). Few researchers, however, have applied a sound theoretical framework. In the few instances when a theory has been applied, either the medical diagnosis of infertility has not been considered, or a component of the model has often been omitted. In this present research a stress, appraisal and coping model is used to provide a guide for understanding men's experiences of infertility. Application of this approach indicates directions for furthering our knowledge of individual variability in adjustment and establishes a solid theoretical basis for clinical investigations.

This research examines the emotional responses of men in infertile couples. This chapter provides an overview of the issues pertaining to the medical diagnosis of infertility, its investigation and treatment. Research has not comprehensively addressed men's responses to infertility and the reasons for this are explored. Reported gender differences in levels of distress and the location of cause of infertility are also examined. The chapter then investigates the psychological implications for men in couples with infertility. Given that much of the current work is not theoretically based, a framework of stress and coping is then explained, followed by the research evidence on infertility which relates to this model.

1.2 Medical aspects of infertility

Infertility is usually defined as the failure to conceive after one year of regular sexual intercourse without the use of contraception (Benson, 1983). Although there are no general population-based surveys of the prevalence or incidence of infertility, a regional investigation has suggested that one in eight childless couples seeks specialist advice in their efforts to conceive (Hull et al, 1985). It has also been reported that about one in six of all couples need specialist help because of difficulty in conceiving, including some trying for a further pregnancy (Department of Obstetrics & Gynaecology, Bristol, 1996). Thus, infertility is clearly a problem that many couples confront, and although some will eventually conceive naturally, many undergo prolonged investigation and treatment (Laffont & Edelmann, 1994).

1.2.1 Diagnosis

Infertility is rarely absolute, where there is zero chance of conception. Most infertility is actually some degree of *sub-fertility*, and the first requirements of diagnosis are the accurate definition of the cause and an estimation of the chance of achieving a pregnancy without treatment. The term infertility is used throughout the text. The classification of infertility can be broadly divided into four categories:

- 1) female factor including ovulation failure, tubal and pelvic inflammatory disease
- 2) male factor where there are sperm disorders
- 3) combination of male and female factors; often referred to as a joint infertility factor
- 4) unexplained cause; also referred to as undetermined where all the key tests of infertility appear normal.

It is apparent from the literature that exact percentages cannot be assigned to each diagnostic category. Although infertility is generally seen as mainly a woman's problem, it is now evident from the research evidence that in about half of all cases of infertility a male factor is involved. Studies of clinical populations have reported that a male factor is involved in anywhere from 35% to 64% of those cases in which a cause for the failure to conceive can be identified (Collins et al, 1983; Hull et al, 1985). It has also been reported that 40% of cases are due to a female factor fertility problem, 40% to a male factor and 2-15% are idiopathic (Speroff et al, 1983), whilst others report 35% for a female factor, 35% a male factor, 20% as a joint problem and 10% as unexplained (Mosher, 1987).

Infertility is defined as either primary or secondary. *Primary infertility* refers to individuals where there is no known history of conception. *Secondary infertility* is not as clearly defined in the literature. By definition anyone who has had a previous conception or child has, without doubt, secondary infertility. What varies is the significance attached to the outcome of that pregnancy. Researchers sometimes include individuals who have conceived in the past but have not carried through a pregnancy to full term. As McEwan et al (1987) explain, secondary infertility can involve a history of miscarriage, ectopic pregnancy or therapeutic abortion. Some researchers, for example Kedem et al (1990), refer to secondary infertility as having had one child or more. In this present study secondary infertility refers to individuals who do not already have a live child.

1.2.2 Semen analysis

All men in couples seeking treatment are required to produce a semen sample as part of the investigation for diagnosis as well as for therapy, that is for assisted reproductive techniques. Semen analysis is useful as the first stage of diagnosis although it has been suggested that by itself it is not a reliable method (Lee, 1996). One aspect of producing a semen sample that may cause anxiety to men is the concern that they may not be able to perform at the time the sample is requested (McGrade and Tolor, 1981). Semen samples also have to be provided for assisted reproductive treatments such as intrauterine insemination (IUI), gamete intrafallopian transfer (GIFT) and in vitro fertilisation (IVF), where women have undergone substantial medical preparation. Furthermore, there is an additional stress for men with a male factor diagnosis in that the sample produced may not be sufficient to fertilise the female oocytes retrieved for treatment. Significant stress may have a negative impact on semen parameters at the time of treatment, for example, reducing the quality and quantity of the sample. Harrison et al (1986) found that there was a significant deterioration in semen quality when samples were produced at the time of treatment compared with those produced several months before the onset of treatment. As Boivin et al (1998) suggest, the potential negative effects of stress may have greater implications for men with a male factor diagnosis whose semen quality is already compromised.

Traditionally a diagnosis of male factor infertility has relied on the analysis of semen specimens. Sperm count is usually scored as so many millions of sperm per millilitre of fluid. The motility (how they move), progression (how strong and purposefully the

sperm move) and density are all examined. The *motile density* or density of motile sperm gives a significant prediction of future fertility. In a study of 867 couples, Hargreave & Elton (1983) showed that sperm density and motility gave independent prognostic information, and that measurement of one sample was sufficient to give a prognosis if the product of the motility and density exceeded 0.5 million motile sperm per ml. The results of that particular study indicated that the chance of conception was reduced only for those with motile densities of less than 2 to 3 million motile sperm/ml.

In semen samples where disordered sperm are identified, several terms are used to describe their function. Complete absence of sperm due to failure of production or blockage (*Azoospermia* - the absence of sperm in the semen) is rare. More common is disordered sperm function which may occur with low or normal sperm counts. There can be a reduction in ejaculate volume (*Oligospermia*), reduced sperm numbers (*Oligozoospermia*), sperm movement problems (*Asthenozoospermia*), an increased number of abnormal shaped sperm (*teratozoospermia*), or a combination of problems (*Oligoteratuasthenozoospermia*). In a minority of cases sperm dysfunction is due to antibodies in the sperm, but in most cases the cause of dysfunction is not understood (Department of Obstetrics & Gynaecology, Bristol, 1996).

Irrespective of the sperm motile density, however, the time spent trying for a pregnancy before medical investigations takes place is an important factor that needs to be taken into account, as well as the age of the female partner, as they give additional prognostic information of the chances of conceiving in the future.

1.2.2.1 Falling sperm counts

There have been recent reports of declining sperm counts, although it is unclear whether or not the apparent decrease is a genuine global phenomenon (Carlsen et al, 1992), or whether we, as a species, are becoming less fertile (Lindsay, 1998). Carlsen et al (1992) have found a general trend showing a global decline in sperm counts. Irvine et al (1996) show that the total number of motile sperm in ejaculate fell by almost a quarter in males born in the United Kingdom in the 1970s compared with those born in the 1950s. Environmental factors such as oestrogen may play a role in this apparent decline (Sharpe & Skakkebaek, 1993). Others argue that the perceived decline in sperm count could be explained by methodological differences (Bromwich et al, 1994) or be connected with the growing interest in male infertility (Lee 1994a).

1.2.3 Treatment options

The efficacy of different treatment options for infertility has not been the subject of large controlled studies (Lee, 1996), but it is generally accepted that no treatment at all currently results in more than about 10% live birth rates per treatment cycle.

Couples with unexplained infertility who have been trying for less than two or three years have a good chance of conceiving without any help. After more than about three years, however, the chance of natural conception is reduced and assisted conception methods need to be considered (Department of Obstetrics & Gynaecology, Bristol, 1996). *Intrauterine insemination (IUI), gamete intrafallopian*

transfer (GIFT) and *in vitro fertilisation* (IVF) are some of the treatment options available. These assisted conception techniques are based on helping sperm on their journey towards the egg and are frequently used with all medical categories of infertile couples (for full details of these treatments see Forti & Krausz, 1998; Winston, 1993).

In the past, couples with a diagnosis of male factor infertility had few effective therapies available and the use of donor sperm often provided the only solution (Lindsay, 1998). Prior to the development of *intracytoplasmic sperm injection* (ICSI), described below, there were few treatments worth considering in cases of male infertility. *Donor Insemination* (DI) would have been a frequently offered option. This still has a role to play but many men want their own genetic children and the prospects have changed quite dramatically since the development of ICSI (Lindsay, 1998).

Since 1991, ICSI has been developed, which is carried out in conjunction with IVF. ICSI is used when the sperm count or motility is very poor and involves sperm being picked up by a fine needle and injected directly into the egg. Sperm can also be obtained via surgery (*microepididymal sperm aspiration*, MESA-ICSI), enabling sperm to be collected from azoospermic men. ICSI appears set to revolutionise infertility treatment in the future (Lee, 1996). Lindsay (1998), however, warns that ICSI has all the pitfalls of conventional IVF and that additional problems may emerge as more patients undergo the process.

ICSI was initially seen as treatment for severe male infertility. Van Steirteghem et al (1993) have shown that, using ICSI, up to 30% live birth rates per embryo transfer are possible for men with poor semen quality. It is possible that even better results will be achieved with other infertility categories. ICSI is not a panacea, however. The procedure requires considerable expertise which may be available only from specialist centres. It may be necessary to ask who will benefit most from this treatment. There are further issues to consider, such as what constitutes a viable sperm, given that even immature and immotile sperm may produce fertilisation and pregnancies, and what the genetic consequences of this technique will be. These issues, and the dilemmas of producing a child at any cost are questions for society at large.

Recent advances in medical technology have given infertile couples hope, but the promise of medical treatment for infertility is not without emotional and psychological costs (Leiblum & Greenfield, 1997).

1.3 Social perspectives of infertility

Most people take their fertility for granted and have never considered the possibility that they might be unable to have a child (McCormick, 1980). Infertility is not uncommon, however, and it is almost always unexpected, often referred to as an unanticipated life crisis (e.g. Mahlstedt, 1985; Menning, 1980). Infertility is a vague term and may mean it is possible to conceive a child but that it might take a long time, or it may require medical assistance. Many couples entering infertility treatments have

guarded against an unplanned pregnancy in order to wait until 'the time was right' to begin their families (Leiblum et al, 1987).

Infertility has traditionally been viewed as primarily a female problem, and even as the woman's fault. The role of the man has been comparatively neglected, perhaps due to the complex mix of social, cultural, medical and historical factors.

1.3.1 Historical perspective

Despite the relatively even distribution of the causes of infertility, until recently, knowledge of women's reproductive biology was considerably more advanced than their knowledge of men's (Daniluk & Fulker, 1995). Men dominated the medical profession until the mid 20th century and infertility investigations and treatments were concentrated on the woman, leaving the investigation of men behind and the study of male infertility in its infancy. Attitudes towards the male role in reproduction generally meant that any suggestion of their part in conception delay implied inadequate sexual prowess and so the cause of the couple's infertility was sought in the woman. Pfeffer (1993) showed that it was not until 1910 that it was recognised that sexual potency did not influence fertility. In the 1920s it was known that there could be problems with sperm production but the view that the female was responsible for reproductive failure still persisted.

Researchers still put more effort into studying the female reproductive systems, despite the recognition that an increased understanding of male infertility was needed (Jequier, 1990), and that male-related problems comprise approximately half the cases

of infertility (DeCherney, 1990). Carmeli & Birenbaum-Carmeli (1994), estimated that, in 1994, about three quarters of female fertility problems could be resolved by assisted reproductive techniques whereas only a third of male factor problems could expect to be treated. This is in line with Slade et al's (1992) finding in a three year longitudinal study of infertile groups, that the group with continued infertility contained a greater number of male diagnoses. It has been suggested that since research and treatment traditionally focus on women, therapies offered to the man are relatively scarce, and his non-medical part in the process places him in a marginal position (Carmeli & Birenbaum-Carmeli, 1994). Male reproduction is much less researched (Mason, 1993) and consequently less is known or understood about male infertility.

1.3.2 Men's attitudes to their health

It is well recognised that there are differences in men's and women's attitudes to their own health (Griffiths, 1994). Women are more accustomed to seeking routine reproductive health care than men (Shapiro, 1988). Society's expectations of men have created an environment in which men are less willing than women to recognise their physical and emotional problems and to seek help (Griffiths, 1996). This may contribute to the central role that women play in decision making about fertility treatment, where it has been found that women are pivotal in initiating treatment (Greil, 1988; Draye et al, 1988).

1.3.3 Infertility and masculinity

Hite's (1991) description of male ideology has centred around male dominance in society where they are seen as emotionally distant, so they seek power and control. These are key parts of their value system where work, independence and dominance are very important. Male fertility has been perceived as a symbol of sexual potency. Many men need to be capable of successful penetration and impregnation in order to feel secure in both their masculinity and sexuality. Over the last 20 years or so, traditional sex roles have undergone substantial change and attitudes towards them are shifting. In particular, the concept of the female role has changed and feminine empowerment has gained momentum, consequently affecting male role ideology. These role changes may affect both men's and women's psychological experiences of sub-fertility.

A further challenge to men is when their manhood is threatened further by their inability to become fathers. It can be hypothesised that a diagnosis of male infertility would lead to crisis and turmoil. To admit to feelings of distress and to seek help, such as counselling, goes against the need to retain power and control (Lee, 1996). The threat to a man's fertility could be seen as a threat to his identity, and his ability to control his life. A diagnosis of a male infertility is not just a shock but a major crisis (Menning, 1980; Mahlstedt, 1985; Mason, 1993; Lee, 1995a). Edelman et al (1994) found that the stronger the masculine identity needs of infertile men, the more distressed they were by their inability to father a child. According to Crawshaw (1995), people exhibit gender-specific reactions to fertility and parenting. Indeed, Monach (1993) shows that men exhibit different reactions from women, where the

women show their feelings about infertility and childlessness whereas men are unable to allow themselves this expression.

1.3.4 Parenting

There are many factors affecting people's motivations for parenthood. Its meaning is strongly influenced by social factors and it is reasonable to suppose that the sexes differ in their approach to parenthood (Humphrey, 1977). In western society, children are likely to be seen as a social investment, confirming parental status and creating a normative family group (Blake, 1979). Parenting is also strongly supported as an important developmental milestone for both men and women and when it does not take place a crisis can arise.

Gender role socialisation prescribes motherhood as the defining role for women in our and other cultures (Rich, 1977; Williams, 1987). Western society reinforces the idea of maternity as a central female role in life. Ussher (1989) states that 'being a woman is synonymous with being a mother'. For men there is no such emphasis on fatherhood; it is generally considered important but as a secondary role after career and economic accomplishments, which are the primary symbols of a man's success (Kaufmen, 1993). McEwan et al (1987) found that infertile women showed poorer adjustment than men and suggest this may be because women see reproduction as a central component of their identity. So despite more role options becoming available to women, motherhood still appears to be the primary defining role for women in our society (Daniluk, 1997).

In summary, the literature confirms that the majority of women anticipate motherhood, and that infertility prohibits the achievement of this major life goal. For men, fertility may be viewed primarily as a reflection of virility and masculinity rather than providing the opportunity to parent.

1.3.5 Childlessness

Women have been considered to bear the brunt of the strain in infertility because they invest more emotionally in childbearing than do men. Abbey et al (1992) note that several authors have found that infertile husbands were less disappointed than their wives at the thought of not having children (e.g. Greil et al, 1988; Van Keep, 1975). Edelmann et al, (1994), however, using a measure more specific to unwanted childlessness (The Meaning of Parenthood Scale), found no gender differences in the disappointment over unwanted childlessness. This implies that the value of having children is similar for both sexes and Hurst et al (1999) argue that unwanted childlessness is therefore likely to be equally stressful for both men and women. Interestingly, Edelmann et al (1994) further report that both women and men estimate that the impact of not having children is greater on women than on men.

It has been noted that infertility and virility can become confused. Manliness has traditionally been viewed as involving making a woman pregnant rather than taking the role of the father. Having a child provides visual confirmation of a man's virility (Lee, 1996). Mahlstedt (1985) comments that a man who is unable to father a child may feel that others doubt his masculinity. It has also been argued that infertile men are subjected to ridicule rather than pitied (Miall, 1986).

Kedem et al (1990) found that infertile men were less optimistic when their infertility was primary than when it was secondary (defined as having a child). Men who already have a child may have more hope of medical recovery, having at least partial fulfilment of the paternity wish and a life that fits into socially acceptable norms (Owens, 1982).

Historically, women's reproduction has been the focus of medical attention and only recently have men been brought into the picture. Men's attitudes and perceptions of their own masculinity, as well as their role in fathering children and becoming a parent are all factors which can be seen to influence their psychological experience of infertility.

1.4 Psychological Aspects of Infertility

Research over the last twenty years or more shows that infertility has a detrimental effect on psychological well-being (Edelmann et al, 1994). The inability to reproduce is often interpreted as a sign of personal failure and infertile people report feeling that they are not complete men or women (Mahlstedt, 1985). Many studies have demonstrated that infertile individuals experience disruption in psychological functioning during the process of infertility investigation (e.g. Lalos et al, 1985; Daniluk, 1988).

The majority of studies investigating psychological factors and infertility focus on women, partly due to the fact that, until recently, reproductive medicine was centred on gynaecology (Nieschlag, 1981). Pantesco (1986) notes that the literature on infertility emphasises the role of the woman while ignoring that of the male. It has been recognised that an underlying societal assumption of male infertility is that of a threat to male sexuality or masculinity (Mason, 1993; Edelman et al, 1994), reflecting the perceived relationship between manliness and the ability to father children. The current social context may pose barriers to the successful adjustment of men with fertility problems. Some of these factors make up the reasons for the neglect of the study of the psychological experiences of men with fertility problems.

1.4.1 General Methodological Considerations

Common methodological concerns relating to the current research literature are the conceptual confusion regarding the existence and measurement of psychiatric morbidity among the infertile, biased sample characteristics, difficulties in selecting appropriate comparison groups and atheoretical research (Berg, 1994). Many instruments measuring psychological functioning were designed to discriminate between normal and psychiatric populations and have not been adapted appropriately for use with medical populations. As Berg & Wilson (1990) importantly highlight, 'difficulties in functioning experienced by infertile couples may reflect experiences directly related to their medical problem rather than underlying psychopathology' (p.655).

Existing research has focused almost exclusively on the individuals who present to fertility services (Wright et al, 1989), and little is known about those who drop out of treatment (Berg, 1994). There is a lack of longitudinal and prospective designs which could demonstrate the causal relationship between experience of infertility and subsequent stress reactions. Cross-sectional studies can contrast infertile individuals at different stages but few studies focus on how the length and stage of treatment, the effects of time, and trying time have influenced psychological functioning (Berg, 1994). Berg (1994) notes that selecting an appropriate comparison group is problematic given that it is difficult to find any life experience that contains elements comparable to infertility.

1.4.2 Duration of infertility and advancing age

Kedem et al (1990) state that the longer the duration of infertility the more psychological dysfunction can be expected. They found that for 107 male patients the duration contributed to their pessimism about their perceived prognosis. Slade et al (1992), in a three year follow-up of 23 infertile couples, found that for 14 couples with continuing sub-fertility, psychological functioning did not improve with time. Differences between fertile and infertile individuals are more likely to be revealed the longer the diagnosed period of infertility (Edelmann & Connolly, 1986). Connolly et al (1987) also found that the longer the period of investigation the more psychological strain was reported in a sample of 843 couples attending an infertility clinic. For men the longer the duration of medical tests the more likely they were to report feelings of anger, guilt and diminished success. By contrast, Daniluk's (1988) results indicated that for 43 couples with primary infertility the medical investigation appeared to be

significantly more stressful at the time of the initial interview, generally reducing as the medical investigations proceeded. Furthermore, Koropatnick et al's (1993) results revealed that symptoms of interpersonal sensitivity appeared to reduce as the duration of infertility increased for both women ($n = 43$) and men ($n = 28$) with primary infertility.

A stage model has been proposed to explain the responses to infertility over time. The literature suggests that infertility produces both short term and long term symptoms of psychological strain (Berg & Wilson, 1991). This approach includes an acute stage where events concerned with diagnosis and early treatment produce stress that subsequently subsides, and a chronic phase in which repeatedly unsuccessful treatments cause further personal and marital strain. Berg & Wilson (1991) found, in a cross-sectional study of 104 couples with primary infertility, that emotional distress increased initially during the first year of treatment, returned to normal during the second year, but went up again significantly during the third year of treatment. Conversely, Boivin et al (1995) found that 27 women who had experienced a moderate amount of failed fertility treatment were the most distressed whereas the psychological distress experienced by those without any treatment ($n = 39$) was the same as those with a high amount of treatment failure ($n = 25$). This research looked at women's reactions only and there is strong evidence to suggest that men experience infertility and its treatment differently from women (Collins et al, 1992). These findings suggest that the distress of infertility is a continuous emotional process rather than a series of independent emotional responses.

The contradictory findings regarding the relationship between duration of infertility and psychological distress indicate that time in treatment may co-vary with other factors in mediating an individual's response to infertility (Koropatnick et al, 1993).

Increasing age and a lack of biological children were predictive of distress in Morrow et al's (1995) study for 86 infertile men but not for 120 infertile women. However, Abbey et al (1992) failed to demonstrate a relationship, in 185 couples, between distress levels for infertile men and women, their age and the length of trying time for a child. Koropatnick et al's (1993) results revealed that there may be a 'curvilinear relationship between age and distress levels in infertile women and men, with coping efficacy increasing with chronological maturity up to a point, after which increased age may be related to increased feelings of anxiety in response to biological time pressures and constraints' (p. 170).

1.4.3 Gender differences

Many researchers and clinicians agree that the experience of infertility and the pursuit of treatment has a major psychological impact on both men and women (Collins et al, 1992). Gender has been reported as having an influence on psychological experiences in which infertile women are, in general, found to be more distressed than their male counterparts (e.g. Abbey et al, 1991; Andrews et al, 1991; Daniluk, 1988; McEwan et al, 1987; Wright et al, 1989, 1991). The literature here is contradictory, however.

1.4.3.1 Women more distressed than men

Recent work indicates that infertility places considerable, but perhaps unequal, psychological stress on both men and women (e.g. Wright et al, 1991; Berg et al, 1991; Greil et al, 1988; McEwan et al, 1987; Daniluk, 1988; Link & Darling, 1986; O'Moore et al, 1983). Wright et al (1989) in a review of 30 controlled research protocols found evidence to support the view that "women tend to be more distressed by the whole experience of infertility and its modern medical management" (p137) than men.

A group of studies have compared women and men in infertility treatment with respect to infertility adjustment and well-being (McEwan et al, 1987; Stanton, 1991), self esteem (Adler & Boxley, 1985), psychological disturbance (Wright et al, 1991; Lalos et al, 1985) marital conflict (Daniluk, 1988), life satisfaction (Link & Darling, 1986) stress (Wright et al, 1991) and sexuality (Daniluk, 1988; McGrade & Tolor, 1981). This research in general indicates that women are more adversely affected by infertility than men. Laffont & Edelmann (1994) demonstrated that women, in comparison to men, rated IVF as having more impact on their emotional state. However, as Berg et al (1991) point out, men typically have been omitted from the research process, so less is known about their response to infertility. Most of the literature supports the idea that women are more distressed than men but the experience for men may be very different and possibly not comparable (Phipps, 1993).

Although both infertile men and women score higher on distress measures than population norms, infertile men are reported to score lower than females. Such

reported differences are likely to be confounded by the contrasting levels of distress reported between men and women in the general population (Hurst et al, 1999).

1.4.3.2 Equally distressing for both women and men.

Not all the research evidence suggests that women are more distressed than men in couples experiencing sub-fertility. Carmeli & Birenbaum-Carmeli, (1994) argue that men have not been found to be less affected than women, although they may be affected in a different way.

Collins et al (1992) looked at three factors in 200 couples entering IVF which differentiated between individuals who anticipated high stress and those who did not: the desire to have a child as the major focus of life, the perceived likelihood of a successful treatment outcome, and gender. Both men and women demonstrated similar feelings on these dimensions when the intensity of emotional reactions was the same. Stanton et al (1991) found in a sample of 76 women and 54 men that women acknowledge more distress specific to their infertility but no differences were evident between men or women in their general emotional distress. Furthermore, Berg et al's (1991) findings, for 104 infertile couples, provided no support for the expectation that infertile women would be more distressed than men. No gender differences were found in the level of emotional strain, sexual satisfaction or marital adjustment. There were some differences in contextual aspects of infertility distress; for example women felt that having children was more important, and more discomfort was experienced in the presence of fertility related stimuli. This suggests that although the distress of infertility may be comparable, the experience is different for men and women. The

perception that a man is less upset may therefore be inaccurate. As Mahlstedt (1985) comments, the man may be not expressing his feelings as openly, as often, or as intensely as his partner.

This data suggests that since distress levels are found in both infertile men and women, it is important that psychological understanding and intervention is targeted towards both sexes.

1.4.3.3 Counselling for women and men

Counselling, which helps the client deal with their reaction to infertility by using a bereavement framework in particular, focuses on the process of acceptance. Lee (1996) observed that crisis and bereavement counselling are frequently requested by women, but the few men who come to counselling do not come to work on crisis or bereavement. Mason (1993) found that men develop their own coping mechanisms, but none of the men she interviewed reported using counselling as a coping strategy but rather to help with the stresses of treatment. The men who had attended counselling reported that they had not found it particularly helpful. Mahlstedt (1985) and Menning (1980) have written specifically about crisis and bereavement within the infertility setting where many of the issues they observed were likened to bereavement. The bereavement aspect is reported to be very important for women (Crawshaw, 1995; Jennings, 1995). For men, Lee (1996) believes this feeling of bereavement does not seem as important but there is insufficient research data available yet to form any firm conclusions. These authors express the view that infertility is a life crisis in which grief is an important emotion. Slade et al (1992)

argue that the mourning process in infertility, if it exists, may be different because there is a potential loss rather than an actual loss. All this work shows the need for a fuller understanding of the implications of infertility, particularly for men.

However, much of the literature on infertility counselling is based on work by clinicians rather than on any systematic evaluation of the problems experienced by the couples and the methods used to resolve them (Edelmann & Connolly, 1987). While there seems little doubt that infertility produces psychological difficulties for most couples, little is known about the clients' needs in terms of therapeutic support, who would benefit from help and what type of intervention would be most effective.

1.4.3.4 Methodological issues

The research investigating the impact of infertility contains methodological flaws with regard to reported gender differences. More recent literature suggests that men are undoubtedly affected by the experience of having fertility problems. There is a growing recognition that men's responses and experiences of infertility are qualitatively quite different from women's. This is not surprising given the different constructions and meanings of motherhood and fatherhood, the role of the reproductive process and also given the very different nature of investigations and treatment that men and women may undergo (Glover, 1996). Perceived gender differences may be due to the fact that women are more involved in treatments and/or their coping styles may be different, resulting in different levels of distress.

Daniluk (1997) proposes several reasons for such gender differences which support the view that the experience is more difficult for women. Much of the research on which this view is developed is based on small, homogenous samples who are white, middle class, married and who voluntarily agreed to take part in the research (Wright et al, 1989, 1991). The generalisability of the results is limited because of the lack of literature addressing gender differences based on ethnicity, class, and marital status. Men are also under-represented in much of this research and this has further implications for generalisability.

The standardised measures used to assess distress may be more sensitive to the ways in which women, rather than men, express their distress and emotions (Wright et al, 1989, 1991). This may have the result of deflating male scores and there is also the possible tendency of men to under-report their emotions and respond in a more socially desirable manner (Greil, 1991).

The gender differences found in this research may “reflect general gender differences in the ways in which men and women have been socialised to cope with negative affect” (Abbey et al, 1991, p298). Given the masculine gender role socialisation in western culture the distress experienced by men with fertility problems may not be manifested in ways that are characteristically expected and measured in studies looking at psychological responses (Daniluk, 1997).

The majority of fertility investigations and treatments involve only the woman and cause more disruption to her life than to her partner’s (Abbey et al, 1992).

Furthermore, women are physically reminded of failure of pregnancy every month with the onset of menstruation. Men may also feel less pressure than women since they do not experience the same age-related decline in fertility (Frias & Wilson, 1985).

Wright et al, (1989, 1991) indicate that, because of the limited diagnostic information prior to the identification of fertility problems, it is difficult to ascertain the actual impact of fertility-related stress and to differentiate between the degree to which gender differences reflect different reactions to being infertile or to the stresses involved in fertility treatment. As Daniluk (1997) claims, what may be being reported are differing gender responses to the medically invasive investigations and treatment of infertility, rather than to the experience of being infertile. In addition, the role of reproductive medicines are not taken into account, where changing hormones may account for variations in psychological reactions. However, it is difficult to disentangle this relationship given that, at present, women usually do have this added stress. Gender differences need to be interpreted extremely cautiously and re-evaluated as the role of men and women in the process changes. With the development of new reproductive technologies men may become more involved and active in the treatment process, and this may produce different psychological reactions.

Importantly, little research provides information about the source of the couple's infertility, although there is evidence to suggest that the partner who perceives themselves as being responsible may experience the greater psychological distress

(Daniluk, 1988; McEwan et al, 1987). Infertile women appear to be more willing to participate in research than their male counterparts (Woollet, 1985). Studies which report the distribution of male factor and female factor diagnoses involve samples which tend to have a higher than average rate of female factor infertility than exists in the general population (Draye et al, 1988; Daniluk, 1988; Berg et al, 1991). The research, therefore, appears to have been largely conducted with samples which are skewed towards women as well as female factor infertility. Berg (1994) warns that 'if the influence of gender is not separated out from the impact of which partner is diagnosed with the infertility, then assumptions can be made about gender based psychological functioning without considering the impact of the diagnosis' (p.152). This, obviously, would obscure conclusions made about the influence of gender on infertility when the diagnosis is not taken into account.

1.4.4 The location of infertility

There is evidence to support the assertion that the partner identified in the medical diagnosis of a couple's sub-fertility will experience the greater psychological strain. Daniluk (1988) found that the 'identified' partner reported significantly higher levels of distress.

The possibility that a diagnosis of male infertility may present a couple with particular difficulties has been raised by a number of studies (e.g. Connolly et al, 1987; Connolly et al, 1992; Kedem et al, 1990). Greater emotional and marital difficulties have been reported by both sexes when the infertility was located in the man (Connolly et al, 1987). Indeed, women perceive the diagnosis of male infertility as causing more

marital difficulties than when the diagnosis lies with the woman. Connolly et al (1992) also found that the initiation of the diagnostic investigation was associated with a decrease in negative feelings for all patients except men who were diagnosed with a male factor problem and they reported increased anxiety and distress. Slade et al's (1992) findings tentatively suggest that the diagnosis of male infertility in particular may lead to a more negative emotional outcome in males. Furthermore, Mikulincer et al (1998) found that in 80 infertile couples, for both men and women, a diagnosis of male factor infertility ($n = 12$) was significantly more distressing and less well-being was reported than for a diagnosis of female infertility ($n = 41$). The finding that male infertility is associated with marital difficulties may be a useful indicator when considering the counselling needs of infertile couples.

Bernt, Bernt & Tacke (1992) show that men and women behave differently depending on the cause of infertility. Women show higher levels of stress and anxiety regardless of the cause but, in all groups of diagnoses, healthy partners (i.e. the partner not identified in the medical cause of infertility) tended to dominate the relationship. Infertile men were more subordinate, less engaged, less interested and not so anxious as their partners. Fertile men were highly engaged emotionally in overcoming their partner's fertility difficulties.

Nachtigall et al (1992) found in 36 couples that, although both men and women are affected by infertility, their emotional responses were significantly influenced by a gender-specific diagnosis. For 6 couples there was male factor infertility only, in 19 couples there was female factor infertility only and in 11 couples, both a male and

female factor were identified. Men's responses to infertility were very similar to a woman's if the infertility was attributed to a male factor, but differed considerably when a male factor was not found. Their results revealed that men reported experiencing more negative emotional responses with respect to feelings of stigma, loss and self-esteem when they had a male factor diagnosis than men without. Women, however, reported those responses irrespective of which partner had the fertility impairment.

Collins et al (1992), however, found that when comparing the diagnosis of male and female cause of infertility the medical diagnosis did not affect the emotional responses of the partners to infertility. McEwan et al (1987) examined the psychological adjustment of 45 men and 62 women. Evidence was found of more distress among women than men was found even when they controlled for the locus of the cause of the infertility when examining sex differences. However, detailed statistical exploration for the male patients, regarding predictors of adjustment, was not justified due to a very low case-to-variable ratio.

Research findings differ over the effect of an ambiguous diagnosis on psychological well-being. Edelman & Golombok (1989) argue that unexplained infertility may be exacerbated by the anxiety generated from an uncertain diagnosis. Couples who receive a diagnosis of unexplained infertility report greater dissatisfaction with their relationships (Daniluk, 1988). McEwan et al (1987) tentatively propose that women who have not been given a diagnosis for the infertility are more likely to suffer emotional difficulties. However, Raval et al (1987) found that males with a diagnosis

of unexplained infertility reported higher levels of cohesion and consensus with their partner, where the absence of blame may be an important mediating factor. Snarey et al (1987) reported that for infertile couples, where both husband and wife had reproductive impairments, there were more positive marital outcomes. This may be because the apportionment of responsibility is perceived as equal.

1.4.4.1 Blame.

The one who is the cause of a couple's infertility may feel under enormous pressure. It has been suggested that women protect their partners from the knowledge of infertility, preferring to take responsibility for it themselves, even when this is not justified (Tennen et al, 1991). However, it is apparent from the literature that both women and men blame themselves for their infertility.

McEwan et al (1987) showed that women who felt personally to blame for their fertility problems were more distressed than those who did not. They also found that women blamed themselves more than did men. Many women (44%) without a diagnosis reported feelings of responsibility for the problem, and even when there was an identified male factor diagnosis, 30% still blamed themselves for the fertility difficulties. They concluded that for women the cause of infertility itself did not contribute to their distress, but the feelings of responsibility were associated with poorer adjustment. This was most evident when the cause of infertility was due to female factors, suggesting that negative events for which one is potentially responsible pose the greatest threat to emotional well-being (Costello, 1982; Hammen & Mayol, 1982). Gender differences were also observed in Berg et al's (1991) study where

assuming responsibility for the infertility was much more prevalent among women. However possession of the organic problem was associated with a greater sense of responsibility in both sexes. Koral & Scutt (1990) found, in couples where the diagnosis was a joint problem, equal apportionment of blame seemed to help to adjust to the guilt felt.

Glover et al (1996a) found that, in 103 sub-fertile men, perception of themselves as being to blame for their fertility difficulties was associated with lowered mood. Abbey et al (1992) showed that stress was increased when infertile men attributed the responsibility to themselves, whereas attributing responsibility to their partner was unrelated to stress. Kedem et al (1990) suggested that infertile men may suffer more psychological distress than their female counterpart as he “.has to bear the blame alone”(p74). If men feel more blamed they may experience more distress. As noted by Hurst et al (1999), Kedem’s statement implies that females have access to a wider and more supportive network which is effective in negating stressors (Sarason et al, 1985) and they show a great willingness to employ the coping behaviour of seeking social support (Stanton, 1991).

The majority of the research discussed so far is based on studies of infertile couples with a bias towards the responses of women. The limited number of studies focusing solely on the psychological aspects of infertility for men is discussed in the following section.

1.5 Research into male infertility

Theories of infertility have generally viewed 'the infertile' as an homogenous group not differentiated by gender so, consequently, many of the findings relating to men have been obtained by default. Explanations are applied *ad hoc* from the woman's experience (Jones & Hunter, 1996) and psychological responses from men are expected to be similar. A more detailed analysis of the influence of a diagnosis needs to be undertaken with men included in the research process. There has been only limited research into psychosocial factors in infertile men, and even fewer studies that concurrently assess male partners of infertile women for psychological well-being (Morse & Hall, 1987).

1.5.1 Male infertility compared with normal groups

The relatively few studies examining the psychological impact of infertility on men suggest that they are considerably affected by the experience. Kedem et al (1990) reported that infertile men are more anxious, exhibit more somatic symptoms and have lower self-esteem than a control group of men with no known fertility problems. Wright et al (1991) found significantly higher levels of distress in infertile men than male population norms. Findings from Morrow et al's (1995) work indicated that 86 infertile men reported greater psychological distress than normative data from the general population with 15% of the sample scoring within the clinical range.

1.5.2 Male factor infertility

There are two main studies solely examining the experience of men with a diagnosis of male factor infertility. Glover et al (1996a) found that 103 sub-fertile men were highly anxious, blaming themselves for their fertility problems and often felt less of a man because of them. Measures of mood, self-blame and life satisfaction remained unchanged over an 18 month period. The results revealed that sub-fertile men experienced high levels of distress but this was expressed in the form of anxiety rather than depression. This suggests that they experienced their fertility problems primarily in terms of a threat rather than loss. The reduction of feelings of manliness relate to anxiety and this is consistent with the hypothesis that men feel their manliness is threatened by their inability to make their partner pregnant. Glover et al's (1996a) findings suggest that there is distress associated with sub-fertility but that it differs considerably from the experiences of women in similar situations. It is necessary to look at the nature of the distress rather than comparing degrees of distress between men and women.

A further study by Band et al (1998) examined psychological distress, using a stress and coping framework, in 51 men with a diagnosis of sole male factor primary infertility. They found that men with an anxious disposition, who engaged in avoidance coping strategies and failed to seek social support experienced greater emotional disturbance. The fact that 84% of the men reported some degree of distress associated with infertility confirms previous research suggesting that almost all individuals will experience infertility as stressful (Dunkel-Schetter & Lobel, 1991). The considerable variation in the emotional responses to infertility is consistent with a

large body of evidence showing that individuals respond differently when faced with threatening events such as male infertility (Lazarus & Folkman, 1984; Taylor, 1983).

1.5.3 Male factor and female factor comparison

It has been noted, previously, that research in infertility has predominantly focused on samples in which there is an over-representation of female factor infertility, and where male experiences are under-reported. In the current literature there are a few studies which redress this imbalance, where comparisons are made between men's psychological experience when the diagnosis is taken into account.

Nachtigall et al (1992) investigated differences in male and female responses to infertility in relation to gender specific diagnosis. Responses by men are reported. Those with a male factor problem reported feelings of loss, such as loss of potency and not having a biological child, whereas men without this problem did not. There was a significant difference in reports of stigma, which was reported mainly in those with a male factor problem. Role failure was viewed differently by the men with a male factor problem than those without, although no significant differences were found. Those with a male factor problem reported feeling a failure because of their inability to fulfil an expected male role....to procreate, whereas, in the cases of a female factor problem, the man identified role failure as a threat to their relationship. However, the numbers in this study were small (n=11 male factor, n=6 for male and female and n =19 for female factor only).

Boivin et al (1998) compared distress levels in 18 men undergoing ICSI who had all received a male factor diagnosis and 22 men receiving IVF treatment who all had a female factor diagnosis (apart from three who were categorised as unexplained). Psychological reactions were monitored for one complete treatment cycle. They found that distress levels were similar for the two groups, apart from a marginal difference just prior to retrieval of sperm when men undergoing ICSI were slightly more distressed. Their finding that distress was similar between the two groups is inconsistent with other findings, where a higher level of distress and negative affect is seen in men with a male factor diagnosis, compared with men in couples with other diagnoses (Connolly et al, 1992; Nachtigall et al, 1992). It should be noted that at the time of these previous studies ICSI was not available, and arguably the optimism about achieving a pregnancy would not have been the same for both men in couples with a male or with a female factor problem.

In addition, Hurst et al (1999) looked specifically at stress and coping mechanisms employed by fertile and sub-fertile men. They aimed to determine the impact of the medical diagnosis, independent of the effect of gender. 24 fertile and 25 sub-fertile men were categorised based on their semen profiles. Similar levels of perceived stress and motivation to have a child were found between the two groups. However, sub-fertile men had to use more coping resources to maintain the same cognitive level as the fertile group. Hurst et al (1999) argue that this finding suggests that sub-fertile men are more affected by the stressor of unwanted childlessness. However, grouping sub-fertile men together on the basis of their semen profiles results in men with a male factor and men in couples with a joint factor being grouped together. One would

expect differences between these two subgroups and this was not examined in this study. The men's appraisal of the situation was also omitted from the methodology, although Hurst et al (1999) did suggest that men may experience sub-fertility as a threat which might be a key factor in developing the sub-fertile males' increased use of coping strategies.

In this small sample of research concentrating on studies relating to male infertility there are a number of deficiencies. Those comparing the location of cause of infertility used small sample sizes which limits their generalisability, and none of them applied the complete model of the stress and coping framework. Viewing infertility in terms of a crisis or a grief process provides little direction for understanding variations in people's responses to infertility. Furthermore these approaches have received little evaluation and it is not known whether emotional expression is necessary for successful adjustment (Stanton & Dunkel-Schetter, 1991). A stress and coping approach to infertility enables an evaluation of individual variability in the infertility experience and the examination of factors that help or hinder people as they try to cope with their infertility. The following section presents the theoretical stress and coping framework of Lazarus & Folkman (1984) and reviews the relevant literature.

1.6 Stress and coping

The literature on the psychological impact of infertility focuses on the stressful aspects of the situation. In Dohrenwend & Dohrenwend's (1981) 'Stressful Life Events

Scale', infertility is rated as one of the most negative stressful situations from a list of 87 items. Effective coping is essential to psychological adjustment among infertile individuals (Demyttenaere et al, 1991; James & Hughes, 1982). Slade et al (1992) comment that the relationship between coping strategies and adjustment has received little empirical attention although their theoretical significance in infertility has been examined by Callan & Hennessey (1989). Coping is clearly of importance in the development of intervention strategies. The more varied the repertoire of coping strategies the more protected individuals seem to be from the effects of psychological stress (Callan & Hennessey, 1989). In general, however, the research conducted on the infertile population has been atheoretical.

1.6.1 Theoretical perspective

Infertility is not a single event, it is a process where the magnitude, breadth, uncontrollability and the consequences of infertility may all contribute to the stress experienced. Infertility can be conceptualised as a "relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p19). The theoretical framework of Lazarus & Folkman (1984) on stress and coping has been applied in understanding infertility (e.g. Stanton 1991, Stanton et al, 1991, 1992; Glover, 1996). This framework proposes that stress consists of three processes: *primary appraisal* (the perception of a potential threat), *secondary appraisal* (the perceived ability to cope with that threat and consideration of a response), and *coping* (the process of executing that response to the perceived demands and threats of the stressor). Cognitive appraisal and coping are, therefore, seen as crucial in the

mediating process of stressful person-environment relationships. Lazarus & Folkman (1984) suggest that situations characterised by unpredictability, negativity, uncontrollability and ambiguity are most likely to be appraised as stressful where the appraisal and coping strategies are central in how the event is experienced. Stress and its relationship to coping is very subjective in nature. It is a continuing process where the flow of influence is multi-directional through feedback loops that constantly change (Morse & Hall, 1987).

Lazarus (1993) proposes that a key appraisal component in emotion is motivation. In order for an emotion to exist there must be an active goal. Emotions result from the way events are evaluated in terms of their significance for our well-being. If our goals are thwarted a negative emotion results, whereas a positive one results from achieving or making progress towards our goals. Since psychological stress derives from a subjective cognition evaluation, not an objective event, it seems conceivable that the appraisal of stress will be an important moderating variable in the experience of and emotional response to infertility (Band et al, 1998).

1.6.1.1 Appraisal

A person appraises a situation in two ways. The primary appraisal involves assessing what is at stake, what are the threats and challenges and what will be lost. In secondary appraisal of that situation the person assesses what, if anything, can be done to prevent harm or increase prospects for benefit. The extent to which the event is controllable is assessed during this stage and the coping options evaluated. The

conclusions reached during the appraisal process would therefore be expected to contribute to a person's psychological adjustment.

1.6.1.2 Coping

Coping is the response a person makes after appraising a stressful situation, with the aim of reducing the stress of that situation. It refers to both the thought processes and the actions which are used. Lazarus & Folkman (1984) defined coping as one's "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands which are appraised as taxing or exceeding the person's resources" (p141). They argue that coping strategies are neither inherently adaptive or maladaptive. This coping process may therefore promote or hinder positive adjustment to infertility. So when "demands are perceived to exceed [their] abilities to cope, individuals label themselves as stressed and experience a concomitant emotional response" (Cohen et al, 1995, p6). Coping can thus be viewed as a mediator of emotions. Lazarus and Folkman (1984), postulate that coping has two major functions: addressing the problem which is causing the distress (problem-focused) and regulating emotion (emotion-focused).

1.6.1.3 Adjustment

Primary indicators of adjustment are an individual's abilities to maintain well-being and manage distress. There is evidence that cognitive appraisals may be important determinants of how well people adjust to stressful encounters (e.g. Folkman et al, 1986a; Folkman et al, 1986b). For example Folkman et al (1986a) have shown that

appraising a situation as potentially challenging, rather than accepting it, is associated with positive outcomes. The set of processes in a stressful transaction is therefore an ongoing cycle, where an outcome of one process may re-invoke a preceding process. Appraisal and coping strategies are not fixed, since these patterns change in response to changes in the demands of the stressor or threatening event (Folkman & Lazarus, 1985). With infertility there is a constant ambiguity about the ultimate outcome. This is an important feature of life stress that influences psychological reactions and has implications for adjustment (Dunkel-Schetter & Lobel, 1991).

Lazarus and Folkman's (1984), problem-focused and emotion-focused coping styles theoretically overlap with approach-avoidance styles despite the fact that emotion-focused coping can involve both approaching and accepting responsibility as well as distancing or avoiding. Much of the current research in infertility has focused on approach-avoidance techniques, such as efforts to actively approach and resolve the threatening situation or engaging in activities unrelated to the problem, rather than drawing on coping models *per se* (Band et al, 1998). The studies that have investigated stress and coping among infertile individuals support both the applicability of Lazarus and Folkman's theory and the need to further examine the interaction between stress, appraisal and coping among infertile populations.

1.6.2 Evidence from the literature

It is clear from the literature that although infertility is stressful for most individuals, it is more devastating for some than for others. The research findings presented so far have examined the emotions and different psychological reactions to infertility, but a

theoretical underpinning to the work has been absent. The following section examines the literature where a stress and coping framework has informed the infertility research. Due to the inter-relationships between appraisal, coping and adjustment there is a certain amount of overlap between these topics.

1.6.2.1 Appraisal

For individuals who desire children, infertility is likely to be characterised as unpredictable, uncontrollable, negative and ambiguous and, therefore, the situation is appraised as stressful. A number of writers (e.g. Griel et al, 1988, Menning, 1980) have suggested that infertility poses a threat to individuals in many ways including their self concept and important life goals (primary appraisal). Couples attempting conception are likely to perceive their infertility as unwanted and to have a negative status (Miall, 1986). They believe they have relatively little control over gaining the desired outcome (Stanton, 1991; Glover, 1996), and are uncertain of the probability of attaining their desired goal.

It has been identified that when negative stressful events are perceived to be caused by internal, stable, and global factors, lower self esteem and stronger anxiety and depression are exhibited than when stressful events are explained by external, unstable and specific factors (Peterson & Seligman, 1984). Kedem et al (1990) found that infertile men who appraised their problem as more stressful and attributed their infertility difficulties to more global causes reported more severe depressive symptomatology.

Both primary and secondary cognitive appraisals were examined by Stanton et al (1991). They investigated cognitive appraisals of infertility and the relationship these appraisals had with the level of adjustment in 76 women and 54 men. The medical diagnoses for infertility were: 16% male factor, 49% female factor, 17% combined male-female causation, and 27% undiagnosed cause. Couples appraised their infertility as both harmful and yet beneficial to the relationship, and also as relatively uncontrollable. For men, threat, challenge and control appraisals of infertility were unrelated to distress. By contrast, women who perceived greater threat and less control reported greater global distress. The findings supported the assumption that psychological distress would be more likely when participants appraised infertility as highly threatening, carrying little potential benefit and as uncontrollable. This applied to the women but not to the men. A higher percentage of female factor diagnosis existed in the sample. The location of causation of infertility was noted but not considered in the research findings.

Perceived control is a factor which contributes to stress in a given situation (secondary appraisal). Although the infertile couple may attempt to control their infertility by seeking diagnostic and medical interventions, not all will attain a successful pregnancy. Abbey et al's (1992) results showed that perceived control was the strongest predictor of fertility problem stress for both sexes. The more control an individual perceived they had over their infertility the less distress was reported. Abbey, Andrews & Halman (1994) found that personal control, the social network and spouse support were significantly positively correlated with life quality, whereas stress, spouse interpersonal conflict, and escape coping were negatively correlated

with life quality. This is consistent with Stanton et al's (1992) finding that escape coping was significantly related to the distress levels of infertile individuals. Glover (1996) investigated perceived control and coping in 83 sub fertile men and found that high control perceptions were associated with lower anxiety. Infertility distress was lower in those who used positive reframing and acceptance, and higher in those who focused on their emotions. It was also found that only infertility control significantly predicted anxiety. The primary appraisal of the situation was not examined, however.

1.6.2.2 Coping

It is recognised that while women report more overt distress in response to their inability to produce a child, they tend to employ more problem-focused coping strategies and escape-coping when dealing with infertility than do their partners. These are strategies that have been documented to be adaptive in effectively managing chronic and long term stressors (Abbey et al. 1991; Stanton et al, 1991). Morrow et al's (1995) results revealed that self blame and avoidance coping were the strongest predictors of psychological distress among infertile men and women. This is consistent with Stanton et al's (1992) finding indicating that infertile individuals who engage in self blame and avoidance are at risk of psychological distress. Cook et al (1989) found that infertile individuals who were anxious and/or depressed were more likely to use avoidance-coping strategies than those who did not have emotional problems. The evidence implies that avoidance coping, denying the existence of the problem and self-blame are risk factors for adverse psychological strain during infertility and this has clear implications for intervention strategies.

Social support is often viewed as a mediating or buffering factor in the coping process. It has been well documented that seeking social support can have benefits for psychological well-being, particularly for infertile women (e.g. Slade et al, 1992; Stanton et al, 1992). Satisfaction with social support has been found to correlate with less distress for women in infertile couples but not for men (Abbey et al, 1992). This supports Sarason et al's (1985) assertion that women receive and value social support to a greater extent than men do. Thus, access to support may be more important for women experiencing stress than for men. However, seeking social support may present infertile men with a particular difficulty. Individuals are known to pursue social support less in situations which threaten self-esteem (Folkman et al, 1986). Band et al (1998) argue that these potential sources of support cannot ameliorate anxiety for these men since revealing their fertility problem will further lower their self-esteem. Slade et al (1992) suggest that the higher levels of distress in infertile males, compared with fertile males, are a reflection of less effective coping. They found that, in their sample of fertile and infertile couples, infertile men used fewer coping strategies, and continuing infertile men showed the lowest use of social support strategies. Self blame and detachment were particularly associated with poor marital adjustment.

Stanton et al (1992) examined coping and adjustment to infertility among 96 women and 72 men, including 72 husband-wife pairs and found that coping through escape-avoidance was associated with more distress. Global distress levels were similar for both men and women. Husbands, however, engaged in more self controlling coping, planful problem solving and distancing than their wives. Diagnosed causes for

infertility were: 16% male factor, 49% female factor, 16% combined male-female causation and 20% undiagnosed cause. Diagnosis was not considered in the analysis and female factor infertility was over-represented in the sample. It is important to assess both global and infertility specific distress because of differences found in global distress and infertility specific distress levels. Furthermore outcome measures of distress and well-being should be used to identify not just coping mechanisms that promote well-being but also those that lessen distress.

In a further study, Stanton (1991) looked at cognitive appraisal, coping processes and adjustment in 52 infertile couples where 13% had a male factor problem, 43% had a female factor problem, 20% had combined factors and 24% an undiagnosed cause. Unfortunately, the different diagnoses were not taken into consideration in the findings and male factor infertility was underrepresented, so male factor/ female factor comparisons were not feasible. Overall, the partners did not differ in their appraisals of infertility and in general felt relatively little control over their fertility problems. Where infertility was perceived as a greater threat, females reported more distress and males lower well-being. Both females and males who felt greater control reported more well-being. However, couples differed in their use of coping strategies. Confrontative coping was the most powerful predictor of distress in males, whereas low appraisal of control and coping through accepting responsibility were uniquely predictors of distress for females. Participants evidenced more global distress than would be expected in the general population although general well-being was comparable. They also found that despite the fact that women acknowledged more

distress specific to infertility than their partners, there was no difference between the men and women in their general emotional distress.

The work of Stanton (1991), Stanton et al (1991, 1992) has comprehensively examined the three processes of the stress and coping framework for infertile couples. The focus of this work was on the comparison of men and women rather than on the location of the cause of infertility. The study by Glover (1996), concentrated solely on male factor infertility also using the stress and coping framework but one of the processes, primary appraisal, was omitted from the research design. In order to bridge these methodological shortcomings the present study investigates the stress and coping framework for men in couples where there is either a male factor or female factor infertility.

1.7 Research aims

Despite the recent advances in reproductive techniques, there is still a need to explore the psychological and emotional well-being of the infertile population. It is clear from the literature that far less is known about men's responses to infertility than women's. Furthermore, there has been little research investigating the appraisal of infertility by males in relation to coping and adjustment, in which the diagnosis of the fertility problem is considered. The studies examining stress and coping in infertile men have either not included one aspect of the appraisal, coping and adjustment framework

(e.g. Hurst et al, 1998; Glover 1996) or not considered the effect of a diagnosis on this process (e.g. Stanton, 1991; Stanton et al, 1991, 1992).

The aim of this present research is to further investigate the male's experience of fertility problems and to inform clinical practice. Lazarus and Folkman's (1984) stress and coping theory is used. In particular, men's associations between their appraisal of the situation (both primary and secondary appraisal), their coping and adjustment/distress to this are explored where the effects of their diagnosis are considered (i.e. a male factor or female factor diagnosis).

1.7.1 Research Questions

(1). How do men in infertile couples appraise and cope with infertility; how distressed are they, and what are their levels of well-being (irrespective of the location of cause)?

(2). What are the differences between men with a male factor fertility problem and men where there is a female factor problem?:

- Are there any differences in the levels of distress and well-being between these two groups?
- Primary appraisal is compared: it is predicted that men will experience their fertility difficulties in terms of both a threat and a loss. Threat will be more salient for those with a male factor problem than for those without.
- Secondary appraisal is compared: differences in perceived control is examined between the two groups.

- Differences in coping styles are compared between the two groups.

(3). What is the relationship between the appraisal of infertility and coping in relation to distress and well-being in men experiencing fertility problems? Specifically it is predicted that:

- Men who appraise their fertility problems in terms of low perceived threat will have better well being and less distress
- Men who appraise their fertility problems in terms of low control perceptions will have better well being and less distress
- Men who cope through escape-avoidance and focusing on emotions will suffer greater distress and less well-being.

(4). What are the differences between men with a male factor fertility problem and men with a female factor fertility problem in relation to distress and well-being and to what extent are these mediated by the appraisal and coping of the situation?

2. Method

2.1 Overview

A study of men's experiences of infertility was carried out by giving the participants two questionnaires to complete. The first questionnaire obtained information about the participants, their fertility history and their perceptions of life satisfaction and the likelihood of achieving a pregnancy. The second questionnaire comprised of quantitative measures focusing on their appraisal of, coping with and their adjustment to their infertility.

2.2 Design

The purpose of the study was to investigate the appraisal and coping responses to infertility in men in infertile couples. Levels of distress and well-being were also measured. A comparison design was then employed looking specifically at differences between men with a male factor fertility problem and men where there is a female factor problem on the measures of appraisal, coping and adjustment (distress and well-being).

2.3 Participants

A consecutive series of men attending and those who were partners of female attendees at the Department of Reproductive Medicine fertility clinics at a large London teaching hospital were recruited over a nine month period. None of the

diagnoses of infertility were excluded and both primary and secondary infertility were included. For the purposes of this study primary infertility refers to individuals where there is no known history of conception and secondary infertility to individuals who have conceived in the past but have not fathered a child. Participants were excluded if they had their own child.

Couples had a consultation with either a urologist or a gynaecologist (there was one urologist and three gynaecologists). Men in couples attending for both first and repeat appointments were recruited. First appointment attendees were included because the service receives tertiary referrals, where most couples have had investigations prior to this appointment and fertility issues have already been identified. All participants were receiving investigation and treatment through the NHS, although it cannot be ruled out that some of the participants might have been receiving private treatment as well.

244 male patients or male partners of female attendees were approached; one refused and 20 participants were excluded (3 due to language problems, 2 who were not attempting a pregnancy and 15 who had a biological child). Of a total of 223 potential participants, 147 men completed and returned the questionnaires.

For details of the sample see the results section.

2.4 Measures

Questionnaire 1 (see Appendix 1)

Information about participants and their fertility history

A series of unstandardised questions were asked. Participants reported their age and their partner's age, the length of time together, and their country of origin. If they originated from outside the UK they were asked how long they had been resident in the UK. Information was also collected about the couple's length of time trying to conceive, previous pregnancies, the length of time since first consulting the GP, about their own investigation, whether they would consider either assisted conception, artificial insemination by donor or adoption and, finally, their perception of the medical cause of their fertility difficulties.

Visual Analogue Scales

Visual analogue scales (VAS) were used to obtain measures of the following:-

Life satisfaction: Participants rated their satisfaction (from none to total) for three scenarios: with life as it is now, with life if they had a baby, and life if they never have a baby.

Likelihood of achieving a pregnancy. Participants estimated their likelihood (0-100%) of eventually achieving a pregnancy.

Questionnaire 2

Primary Appraisal (see Appendix 2)

Threat and challenge. A measure of infertility threat and challenge, developed and used in Stanton's (1991) study with a similar population (Cronbach $\alpha = .82$; $\alpha = .76$ respectively) was employed. Threat and challenge were measured with ten 7-point Likert scales, 7 items for threat and 3 items for challenge. Mean scores potentially ranged from 1 (low threat/challenge) to 7 (high threat/challenge). Threat appraisals were evaluated by participants rating the extent to which their infertility had the potential for harm to such areas as important life goals, self-esteem, their relationship, financial security and health. Challenge was assessed by asking participants the extent to which infertility provided the potential for the strengthening of a relationship, a personal challenge or for personal growth. Reliability was maintained in the present study for these measures - both threat and challenge had high Cronbach alpha's ($\alpha = 0.81$ and $\alpha = .76$ respectively). This was the only measure identified to assess threat and challenge appraisals for infertile individuals.

Loss. No suitable questionnaire was identified for measuring loss appraisal in infertility and so a brief measure was developed consisting of items derived from qualitative studies on infertility (e.g. Jones & Hunter, 1996; Nachtigall et al, 1992; Mahlstedt, 1985). Ten items were constructed using a similar structure to the threat and challenge appraisal scale (Stanton, 1991). Loss appraisals were assessed by asking a pilot group of 24 male participants attending the fertility clinics to rate the extent to which their fertility problems had provoked feelings of loss to such areas as

their relationship, potential role of being a father, hopes for the future, feelings of masculinity, sense of being normal and important life goals. Internal consistency of the loss scale was examined using Cronbach's alpha coefficient. This was found to be high ($\alpha = .88$), indicating good reliability. No changes were made to the questions and the pilot group did not take part in the present study. Loss was measured with ten 7-point Likert scales. Mean scores ranged from 1 ('not at all') to 7 ('a great deal'). The present study also demonstrated good reliability (Cronbach $\alpha = .89$).

Secondary Appraisal (see Appendix 3)

Perceptions of personal control. Participants' perceptions of personal control were measured using the Pearlin Mastery Scale (Pearlin & Schooler, 1978). This provides an overall score reflecting the individual's perception of their mastery over life in general. The scale comprises 7 items with which people agree or disagree on a 4-point scale. Items 6 and 7 are reverse-scored. Scores ranged from 7 (low mastery) to 28 (high mastery). Reliability and validity had been demonstrated on a sample of 2,300 males and females from the general population with follow-up data on 1106 of the original cohort (Pearlin, Lieberman, Menaghan & Mullan, 1981). The current study also found good internal consistency (Cronbach $\alpha = 0.804$).

Perceived infertility control. This was measured by an adapted version (Glover, 1996) of Miller Campbell et al's (1991) scale for infertile women. Miller Campbell et al (1991) reported a high internal consistency (Cronbach $\alpha = 0.76$). The adapted version (Glover, 1996) comprises 7 items, each item being scored from 1 (not at all) to 5 (completely). Each participant's infertility score was derived by taking the mean

of their seven scores. Higher scores indicate high perceived control over infertility and low scores represent little perceived control. High internal consistency was demonstrated in Glover's (1996) scale, (Cronbach $\alpha = 0.81$), and replicated in the current research (Cronbach $\alpha = 0.70$) suggesting reliability was maintained.

Coping (see Appendix 4)

The Ways of Coping Questionnaire (WOC; Folkman & Lazarus, 1988) is the most widely used measure of coping, containing eight sub-scales each corresponding to a specific coping strategy. However, the reliability of the factor structure of the revised questionnaire has been questioned (Parker, Endler & Bagby, 1993). The coping strategies questionnaire (Cope) is a theoretically derived measure and includes several sub-scales tapping different styles of problem focused coping, whereas the WOC has only one. The Cope sub-scales cover not only problem and emotion focused coping but also examine the function of these strategies. The Cope questionnaire was selected as the measure in this study because it identifies the specific types of problem solving strategy used and their adaptiveness.

Cope (Carver, Scheier & Weintraub, 1989), a coping strategies questionnaire was employed. This is a standardised measure previously used in the work of male sub-fertility (Glover, 1996). Initial findings suggest that Cope has good reliability and validity (Carver et al, 1989). The scale has 15 sub-scales looking at both problem and emotion focused coping and how functional the strategies might be. There are 60 items with a scale from 1-4. Each sub-scale is made up of four items and scores are

derived by summing the item scores within each sub-scale. For each sub-scale there is a minimum score of 4 and a maximum of 16. High scores indicate that the strategy is often employed, and a low score that it is rarely used.

Adjustment (see Appendix 5)

Measures of both distress and well-being were employed to assess psychological adjustment. Stanton et al (1991), note the importance of looking at positive adjustment to stress where positive and negative affect have been found to be associated with different forms of cognitive appraisal and coping in chronically ill adults (Felton et al., 1984). Global and infertility-specific adjustment were assessed.

Distress

Global distress. This was assessed with the three sub-scales of the revised Symptom Checklist-90, anxiety, depression and hostility (SCL-90-R; Derogatis, 1977). This is a well established standardised measurement with demonstrated reliability and validity (Derogatis, 1994). The SCL-90-R has normative data available on four groups including medical, psychiatric and community samples. The sub-scales have been used in most previous infertility research to give a global measure of distress. The question "loss of sexual interest or pleasure" in the depression sub-scale was removed because it was felt strongly that this question would falsely elevate scores. There were 12 items on depression, 10 measuring anxiety and 6 on hostility. Scores ranged from 0-4 for all sub-scales, with high scores indicating high distress. The three sub-

scales were collapsed, by summing the items, to provide a total measure of general distress.

Infertility distress. An infertility distress measure (Stanton, 1991) was used as a situation specific measure of distress. This was developed and used in Stanton's (1991) study with a similar population and has demonstrated good reliability and validity with a high internal consistency (Cronbach $\alpha = .94$), which was also established in the current study (Cronbach $\alpha = .96$). The scale consists of 29 items. Participants indicated on a five-point scale how descriptive each item was of their feelings about infertility. The scale included items such as sad, angry, empty, annoyed, guilty and anxious. Mean scores ranged from 1-5 with high scores indicating high distress. No other infertility distress measure was identified whereas other research appears to employ VAS scores (e.g. Glover et al, 1996) or single questions (e.g. Band et al, 1998).

Well-being

Global well-being. The well-being questionnaire (Bradley & Lewis, 1990) was employed to give a measure of global well-being. Although it was originally developed for a diabetic population where data is available for both men and women, it was chosen for this study because of its ease of use and applicability in a health population. It contains 22 items rated on a four point scale ranging from 0 (not at all) to 3 (all the time), with four sub-scales, depression, anxiety, energy and positive well-being. High scores indicate more of the mood described by the sub-scale label. A total well-being score can be obtained by summing the sub-scale total scores. Bradley

& Lewis (1990) reported high Cronbach alphas (alphas ranged from 0.70 to 0.88) indicating that each of the well-being sub-scales was internally reliable.

Infertility well-being. An infertility specific measure (Stanton, 1991) was used as a situation specific measure of well-being. It was developed and used in Stanton's (1991) study with a similar population and had a high internal consistency (Cronbach $\alpha = .93$), which was maintained in this current research (Cronbach $\alpha = .93$). The scale consists of 27 items, where participants indicated on a five-point scale how descriptive each item was of their feelings about infertility, for example confident, optimistic, healthy, and hopeful. Mean scores ranged from 1-5 with high scores indicating high levels of well-being. This was the only measure identified for assessing infertility well-being.

2.5 Procedure

Ethical approval was obtained from the local research ethics committee (see Appendix 6). Male patients and female attendees without their male partners were approached by the researcher while they waited to see their consultant.

For men attending the clinic: An information sheet was given to participants summarising the research and inviting them to take part. Written informed consent was obtained from each participant before any data was collected. Participants were informed that the consultant they were seeing would be providing a medical opinion

about their infertility. Two questionnaire booklets were given and explained. The rationale for providing two questionnaires was to maximise participants' involvement in the study whilst they were at the clinic. Due to time constraints, they often had time only to fill out a short questionnaire or were unable to complete any of the questionnaires at the clinic. Some participants completed both the questionnaires at the clinic, others completed the first questionnaire at the clinic but took the second one home, or took both home to complete. The first (short) questionnaire collected demographic information, details about their fertility history including their perceptions about the medical cause of their fertility problems (i.e. the couple's). The Visual Analogue Scales investigated their estimated chance of pregnancy and life satisfaction now, if they were to have a baby, or if they never have a baby. The second questionnaire included questions relating to appraisal, coping and adjustment (distress and well-being). Participants were thanked at the end of both questionnaire booklets.

Partners of female attendees: Men in couples who did not attend the clinic, were recruited through their female partners. The researcher explained to the woman the rationale of the study and gave a pack containing an information sheet, consent form and two questionnaires with a stamped addressed envelope for their partner to return the questionnaires. The female attendees were informed that the consultant they were seeing would be completing a medical opinion about the couple's fertility status, and that this would only be used once their partner gave written consent and returned the questionnaires.

See Appendix 7 for the medical opinion sheet, Appendix 8 for the participant information sheet and Appendix 9 for the consent form.

2.6 Data analysis

Data was checked to ensure it met the assumptions for parametric analysis and multivariate analyses. Descriptive techniques were used to investigate appraisal, coping, distress and well-being for men in infertile couples regardless of the location of their infertility (Question 1). T-tests were then employed to explore the differences between men with a male factor and those with a female factor diagnosis (Question 2). Correlations and standard multiple regression analyses were used to examine the relationship of the independent variables, appraisal and coping, on the outcome measures, both global and infertility distress and well-being for the two groups (Questions 3 & 4).

3. Results

3.1 Overview

The results are presented in two parts, the first providing a description of the data set and the second examining the comparison of appraisal, coping and adjustment between men with a male factor and men where there is a female factor. The group of men with a male factor is referred to from here on as MMF and men with a female factor as MFF.

The first part has four sections. The first section includes data on questionnaire completion. The second section provides a description of the sample characteristics for both the responders and a group of non-responders where comparisons between these groups are made. The third section presents figures on appraisal, coping, distress and well-being for the total sample. The fourth section examines the categorisation of groups based on the medical opinion and the participants' own perspective of their fertility status.

The second part of the results focuses on the comparison of MMF and MFF. Differences between their appraisal and coping strategies are investigated as well as their levels of distress and well-being. The relationship between the appraisal and coping styles in relation to the outcome measures, distress and well-being are explored for both MMF and MFF.

3.2 Descriptive information

3.2.1 Questionnaire completion

Overall there was a 65.9% response rate by men attending the clinic and by men whose partners attended the clinics. Table 1 summarises the number of participants approached and the number of responders. More specifically:

- 23 men completed both of the questionnaires during their clinic attendance.
- 121 men completed the first questionnaire at the department but, due to time constraints, took the second questionnaire home. 86 (71.1%) men returned the second questionnaire in the stamped addressed envelope provided. Thus for 35 participants, information is available for the first questionnaire booklet only and they are referred to as non-responders.
- 20 men took both questionnaires away with them for posting back in the stamped addressed envelope provided. Of these, 13 (65%) returned both questionnaires.
- 59 female patients attended the clinic without their male partners and were approached by the researcher. 25 (42.4%) of their partners returned the questionnaires.

Table 1: Summary of questionnaire completion

	No. Approached	Returns
Male completed at clinic	23 (10.3%)	23 (15.6%)
Completed 1st at clinic, 2nd took home	121 (54.3%)	86 (58.5%)
Male took all	20 (8.9%)	13 (8.8 %)
Female took all	59 (26.5%)	25 (17 %)
TOTAL	223	147

3.2.2 Characteristics of the sample

The total sample comprised 147 men in sub-fertile couples. All subjects had been trying to conceive for a minimum of one year. Most men originated in the United Kingdom (n = 103; 69.6%), of the remaining 44, 18 came from countries in Asia and Africa and 16 originated from other western countries. All participants had been resident in the UK from between six months to 43 years (Mean = 16.63 years). The characteristics of the sample are given in table 2 below.

Table 2: Sample characteristics

	Mean (years)	Sd	Range
Age	36.08	5.51	21 - 64
Partner Age	34.59	4.88	21 - 46
Time together	6.68	4.00	1.5 - 18
Time trying to conceive	2.88	2.08	1 - 13
Time since first consulting GP	1.86	2.02	0.25 - 13

The male participants were slightly older than their partners. Couples had been together on average for approximately six and a half years and had been attempting pregnancy for an average of two and a half years.

3.2.2.1 Investigation of infertility

Over half the sample were attending for a repeat appointment (n = 86, 58.5%). 61 participants (41.5%) were being seen for their first appointment at the department. Approximately three quarters of the men attending in couples with fertility problems were seen by one of the three gynaecologists, while 27.3% were seen by the urologist. From the information about their fertility status, 99 (67.3%) men reported primary infertility and 48 (32.7%) were experiencing secondary infertility. The decision to seek help was joint for the majority of cases (n = 98, 66.6%). Of those remaining, 47 reported that it was their partner's decision, while 2 said the decision was solely theirs.

Both the consultant and the participant reported their opinion about the medical cause of the fertility difficulties. This is illustrated in table 3.

Table 3: Comparison of medical opinion and participants own opinion for the medical cause of their fertility difficulties

	Medical Opinion	Participants Opinion
Male Factor	27 (18.4%)	24 (16.3%)
Joint but mainly male factor	15 (10.2%)	22 (15%)
Female factor	47 (32%)	18 (12.2%)
Joint but mainly female factor	10 (6.8%)	20 (13.6%)
Joint	11 (7.4%)	34 (23.1%)
Unexplained	25 (17%)	29 (19.7%)
Undiagnosed	12 (8.2%)	

Most men reported that they would be willing to consider assisted conception techniques to help with their fertility problems but were not likely to consider AID. This is illustrated in table 4.

Table 4: Frequencies of participants willingness to consider three different options for achieving a pregnancy or having children

Option	Yes	No	Maybe	No Response
Assisted Conception	108 (73.5%)	8 (5.4%)	29 (19.7%)	2 (1.4%)
Artificial Insemination by Donor (AID)	8 (5.4%)	104 (70.7%)	32 (21.8%)	3 (2.0%)
Adoption	25 (17.0%)	57 (38.8%)	61 (41.5%)	4 (2.7%)

Participants' expected satisfaction with life if they were to have a baby was extremely high and lower scores were seen for their satisfaction with life if they were never to have a baby. Due to high skewness and kurtosis for scores on estimated chance of pregnancy and life satisfaction the median scores are reported (N.B. median scores have been quoted in previous research using this measure). Scores are provided in table 5.

Table 5: Median scores of estimated pregnancy and life satisfaction

	Median	Range
Estimated (%) chance of becoming pregnant	70.0	0 - 100
Satisfaction with life now *	75.0	20- 100
Satisfaction with life if I had a baby *	95.0	20 - 100
Satisfaction with life if I never had a baby *	50.0	0 - 100

* 0 = no life satisfaction, 100 = total life satisfaction

3.2.3 Comparisons between responders and a group of non- responders

Of the 223 men approached, 35 men attending the clinic completed the first questionnaire but did not return the second. Some information is therefore available for this non responding group which is often unavailable in other studies.

Comparisons were made between the responders (n=147) and this group of non-

responders (n=35) to see if there were any differences between the two groups, which is important for generalising the findings. All the non-responding men had been attempting a pregnancy for a minimum of one year.

Differences in sample characteristics, estimated chance of pregnancy, and life satisfaction scales between responders and non-responders were explored using Mann-Whitney U tests. No significant differences were found between the two groups on any of these variables.

Chi squared tests were undertaken to examine differences between responders and non-responders on the variables pertinent to infertility and its investigation and also to country of origin. Again no differences were found on any of these variables.

A medical diagnosis was given by their consultant and male participants also stated what they considered to be the medical cause of their fertility difficulties. Table 6 demonstrates the range of each medical diagnoses and the male participants' opinion. No differences were observed between responders and non-responders for either the medical opinion given ($\chi^2 = 6.23$ (6); n.s.) or the men's own opinion ($\chi^2 = 10.59$ (5); n.s.).

Table 6: Frequencies and percentages of the medical opinion and participants own opinion for the medical cause of their fertility difficulties for non-responders

	Medical Opinion	Participants Opinion
Male Factor	6 (17.1%)	9 (25%)
Joint but mainly male factor	1 (2.9%)	7 (20%)
Female factor	7 (20%)	2 (5.7%)
Joint but mainly female factor	3 (8.6%)	4 (11.4%)
Joint	5 (14.3%)	2 (5.7%)
Unexplained	9 (25.7%)	11 (31.5%)
Undiagnosed	4 (11.4%)	

Scores are given in table 7 on estimated chance of pregnancy and satisfaction with life. Again the median score is quoted due to extreme skewness and kurtosis of the data and also to allow comparisons with previous work using this measure where the median score was provided. Responders and non responders were similar on these scales. The table below illustrates the median scores comparing the two groups and findings from Glover's (1996) study of sub-fertile men where similar responses are observed.

Table 7: Responses for life satisfaction scores and estimated chance of pregnancy at clinic attendance for responders (1), non-responders (2) and Glover's (1996) study (3)

	Median (1)	Median (2)	Median (3)
Estimated (%) chance of becoming pregnant	70.0	67.5	63
Satisfaction with life now *	75.0	72.5	76.0
Satisfaction with life if I had a baby *	95.0	100	92.0
Satisfaction with life if I never had a baby *	50.0	45.0	49.0

* 0 = no life satisfaction, 100 = total life satisfaction

3.2.4 Question 1. How do men in infertile couples appraise, cope and adjust to infertility, irrespective of the location of cause?

Prior to data analysis, all the continuous variables were examined for missing values and for the fit between their distributions and the assumptions of multivariate analysis. Missing values were replaced by the mean for all cases on that variable. When extreme kurtosis and skewness were identified, transformations were applied to reduce this (Tabacknick & Fidell, 1989). Square root transformations were carried out on the challenge (primary appraisal) scale, for two Cope sub-scales (seeking

emotional social support and humour), the three SCL-90-R sub-scales (anxiety, depression and hostility), two well-being sub-scales (anxiety and depression), and finally the infertility-specific well-being scale. The total well-being score was first reflected and then a square root transformation applied. Logarithmic transformations were conducted for the threat and loss (primary appraisal) scales, five Cope sub-scales (turning to religion, focus on and venting of emotions, denial, behavioural disengagement, and alcohol/drug use), and the infertility specific distress score. The infertility control (secondary appraisal) scale was negatively skewed and after transforming the variable then became positively skewed so it was subsequently not transformed.

The SCL-90-R sub-scales, (anxiety, depression and hostility) were collapsed into one variable to indicate global distress (mean; 0.66, Sd = 0.65). This new composite global distress variable was negatively skewed and a square root transformation was employed to fit the assumptions of multivariate statistics.

A description of the scores for appraisal, coping and adjustment for the whole group is given. Untransformed means and standard deviations (Sd) are provided from here on unless otherwise stated.

3.2.4.1 Appraisal

Scores for primary and secondary appraisal are summarised in table 8.

Primary Appraisal:

Men in infertile couples appear to appraise their experiences more in terms of a challenge than a loss or a threat, although all scores fall below the scale's mid-points. For example, 41% of men reported feeling at least moderately challenged by their infertility, 30% reported feelings of loss and 14% felt threatened by their infertility (i.e., score of 4 or above on a 7-point scale). Due to inconsistencies in the scoring of the threat and challenge scales in other research, direct comparisons cannot be made. In Stanton's (1991) study and that of Stanton et al (1991), men rated their infertility more in terms of a challenge than a threat, where threat had mean scores of 2.12 (Sd = 1.22) and 1.75 (Sd = 0.96) respectively and a challenge had mean scores of 4.18 (Sd = 1.72) and 4.12 (Sd = 1.89), although scores were rated on a five point scale. Because the loss scale was constructed for the purposes of the current study, no norms were available for comparison.

Secondary Appraisal:

Perceptions of general control beliefs were high, mean and median scores on the Pearlin Mastery scale (personal control) were 21.57 and 21.0 respectively. The same median score was found by Glover (1996) in a sample of sub-fertile men. Perceived infertility control was measured with an infertility control scale where the median was 3.3. This compares with a median of 3.4 reported by Glover's (1996) study.

Table 8: Mean, standard deviations, median scores and range of scores for measures of primary and secondary appraisal

Measure	Mean (Sd)	Median	Range
Threat (1)	2.63 (1.17)	2.6	1.0 - 6.14
Challenge (1)	3.32 (1.57)	3.3	1.0 - 6.67
Loss (1)	3.13 (1.50)	3.0	1.0 - 6.6
Personal control (2)	21.60 (3.46)	21.0	14 - 28
Infertility control (2)	3.19 (0.57)	3.3	1.14 - 4.86

(1) = primary appraisal (2) = secondary appraisal

3.2.4.2 Coping

Of the 15 types of possible coping, planning, active coping and positive reinterpretation and growth were the most frequently rated styles whereas alcohol/drug use and behavioural disengagement were the least used styles of coping. Glover (1996) also reported active coping, planning and positive reinterpretation and growth having the highest median scores with religion and alcohol/drug use the lowest. Mean and median scores on the Cope scale for the current study and Glover (1996) findings are provided in table 9.

Table 9: Coping scale mean, range and median scores compared with Glover (1996) median scores

Cope Scale	Mean (Sd)	Range	Median	Glover (1996)
Planning	11.84 (2.8)	4-16	12.0	12.0 (2)
Active coping	11.58 (2.6)	4-16	12.0	12.0 (1)
Positive reinterpretation and growth	11.57 (2.8)	5-16	12.0	12.0 (3)
Acceptance	10.27 (2.9)	4-16	10.0	10.0 (5)
Seeking instrumental social support	9.46 (3.1)	4-16	9.0	10.0 (4)
Restraint Coping	9.41 (2.8)	4-16	9.0	9.0 (7)
Suppression of competing activities	9.2 (2.2)	4-16	9.0	9.0 (6)
Seeking emotional social support	8.10 (3.1)	4-16	8.0	8.0 (8)
Focus on and venting of emotions	8.03 (2.3)	4-16	8.0	7.0 (9)
Humour	7.97 (3.2)	4-16	7.0	7.0 (11)
Mental disengagement	7.85 (2.2)	4-13	8.0	7.0 (10)
Turning to religion	6.52 (3.8)	4-16	4.0	4.0 (14)
Denial	5.89 (2.4)	4-16	5.0	5.0 (12)
Alcohol/drug use	5.71 (2.6)	4-16	4.0	4.0 (15)
Behavioural disengagement	5.41 (1.9)	4-13	5.0	5.0 (13)

() = Glover's 1996 order of median scores

3.2.4.3 Adjustment

Scores for distress and well-being are illustrated in table 10 and comparison data is provided where possible.

Distress:

Higher mean scores were found for the depression sub-scale of the SCL-90-R than for hostility and anxiety. Compared to male non-patient norm groups (Derogatis, 1994), 24% obtained anxiety scores that were greater than one Sd above the mean, that is above the 84th centile ($t > 60$), and 17% scored above the 98th centile ($t > 70$). For depression, 22% scored above the 84th centile and 27% above the 98th centile. Hostility scores were above the 84th centile for 23% of men and above the 98th centile for 12%.

The infertility specific distress mean scores can be compared with those reported by Stanton et al (1991) for men in infertile couples. It can be seen that the current sample experience similar, or even slightly higher, levels of infertility specific distress.

Well-being:

Direct comparisons for the general well-being measures need to be interpreted cautiously because the male comparison sample are not norm data, they are a sample of diabetic men. Anxiety and depression scores were higher for this sample, but overall levels of psychological well-being were similar indicating good well-being. The scores of infertility specific well-being are consistent with Stanton et al's (1991) findings for men in infertile couples.

Table 10: Mean scores, standard deviation and range of scores for measures of distress and well-being and comparison data

Measure	Mean (Sd)	Range	Comparison mean
Distress			
SCL-90-R Anxiety sub-scale	0.56 (0.63)	0.0 - 2.90	0.14 * ¹
SCL-90-R Depression sub-scale	0.78 (0.77)	0.0 - 3.42	0.18 * ¹
SCL-90-R Hostility sub-scale	0.63 (0.77)	0.0 - 3.67	0.18 * ¹
Infertility Specific Distress	1.92 (0.77)	1.0 - 4.07	1.60 (0.52) * ²
Well-being			
Well-being sub-scale: anxiety	4.32 (3.55)	0.0 - 14	3.7 (3.5) * ³
Well-being sub-scale: depression	4.38 (3.01)	0.0 - 16	2.8 (2.8) * ³
Well-being sub-scale: energy	7.17 (2.84)	0.0 - 12	/
Well-being sub-scale: positive	11.49 (3.95)	1.0 - 18	13.5 (3.7) * ³
Well-being Total	46.04 (11.52)	10 - 65	43.1 (8.8) * ³
Infertility Specific Well-being	2.42 (0.64)	1.1 - 4.7	2.53 (0.78) * ²

* 1 = Derogatis (1994) * 2 = Stanton et al (1991) * 3 = Bradley et al (1990)

3.2.5 Categorisation

A dilemma which arose from asking both the clinician and the participant about the medical cause of the participants fertility status was how to categorise the groups based on this information. It is apparent from the previous literature that fertility

status is based solely on the medical opinion. However, table 11 indicates that participants do not always perceive their diagnosis in accordance with the medical opinion they have received.

Table 11: A matrix of medical opinion and participants own opinion of infertility

	OWN OPINION						
	Male	Joint mainly male	Female	Joint mainly female	Joint	Unexp- lained	
MEDICAL OPINION							
Male	14	9	/	/	2	2	27
Joint mainly male	7	5	/	/	1	2	15
Female	/	/	15	12	12	8	47
Joint mainly female	/	/	1	1	5	3	10
Joint	1	4	/	2	3	1	11
Unexplained	2	1	2	4	8	8	25
Undiagnosed	/	3	/	1	3	5	12
	24	22	18	20	34	29	

In order to examine whether there were any differences between men whose perception was in agreement with the medical diagnosis they had received and men whose perceptions were different (i.e. disagreement), the diagnostic categories male and joint mainly male were collapsed into one male factor group. The group of 12 men who had not received a diagnosis were excluded. MMF appear to have more

agreement with their infertility diagnosis than men with other diagnoses. This is demonstrated in table 12.

Table 12: Participants agreement with the medical opinion about their fertility status

Medical Diagnosis	Agreement	Disagreement	Total
Male factor	35 (83%)	7 (17%)	42
Female factor	27 (57%)	20 (43%)	47
Joint but mainly female	2 (20%)	8 (80%)	10
Joint	3 (27%)	8 (73%)	11
Unexplained	8 (32%)	17 (68%)	25

3.3 Comparison of men with a male factor (MMF) and men with a female factor (MFF)

These two groups were categorised according to the medical diagnosis regardless of the participants' own opinion of the medical cause of their fertility problems. Therefore the MMF group comprised of 42 men and the MFF group contained 47 men. Significant differences were observed between MMF and MFF men for their agreement with the medical diagnosis ($\chi^2=7.03$ (1); $p=0.008$). It is apparent that for MFF, significantly more men disagreed with the diagnosis (or perceived the diagnosis differently to the medical diagnosis) than expected. Furthermore of those disagreeing

only 3 did not attend the clinic whereas of those MFF who agreed with the diagnosis, 9 did not attend the clinic. Table 13 illustrates these findings.

Table 13: Observed and expected agreement with medical opinion

Medical Diagnosis		Agreement	Disagreement
Male Factor	Observed	35 (83%)	7 (17%)
	Expected	29.3	12.7
Female Factor	Observed	27 (57%)	20 (43%)
	Expected	32.7	14.3

3.3.1 Question 2. What are the differences between MMF and MFF for appraisal, coping and adjustment to infertility?

Scores for MMF and MFF for appraisal, and adjustment are summarised in table 14. As hypothesised, men in both groups felt threatened and challenged by their infertility and reported feeling a loss. Both the mean scores and responses to specific primary appraisals are informative. For example, 64% MMF and 53% MFF felt that infertility threatened important life goals, and 59% MMF and 79% MFF felt that infertility had harmed their partner's emotional well-being. With regard to challenge, 57% MMF and 55 % MFF reported that infertility provided a personal challenge and 48% MMF and 57% MFF felt that it strengthened their relationship. In relation to loss, 66% MMF and 47% MFF reported feeling they had lost the potential for having a biological child with 56% MMF and 43% MFF having lost their hopes for the future.

Furthermore, 36% MMF and 11% MFF reported a loss of feelings of masculinity, and 40% MMF and 30% MFF reported a loss of sexual spontaneity. With regard to secondary appraisal, men in both groups reported very high personal control and high control over their infertility.

Compared to a non-patient norm group (Derogatis, 1993) 24 % MMF and 25% MFF obtained scores above the 84th centile and 17% and 13% (respectively) scores ranged above the 98th centile for the SCL-90-R anxiety sub-scale. For the SCL-90-R depression sub-scale, 14% MMF and 32% MFF scores were above the 84th centile and 31% and 23% above the 98th centile. Finally for the hostility sub-scale, 12% MMF and 28% MFF obtained scores above the 84th centile where 19% MMF and 6% MFF scored in the 98th centile. Men generally reported good psychological well-being.

No significant differences were found between the two groups when t-tests were conducted for appraisal, distress and well-being.

T-tests were then conducted to see if any differences existed between the two groups when the participants' own perception of their fertility status was considered. A similar pattern of results was observed for this sample of male and female factor diagnoses who agree with their diagnosis (MMF = 35 and MFF = 27), where no differences were found on appraisal and adjustment. Furthermore no significant differences were seen when comparing MMF or MFF for agreement or disagreement with their medical diagnosis on appraisal, coping and outcome measures of distress

and well-being. It can be seen that although the participants' own opinion and medical opinion can differ about the source of a couple's infertility status, it does not seem to affect the participants' appraisal and adjustment to infertility.

Table 14: Mean scores for MMF and MFF on the appraisal distress and well-being scales

		MMF Mean (Sd)	MFF Mean (Sd)
Appraisal	Threat	2.59 (1.21)	2.95 (1.27)
	Challenge	3.37 (1.57)	3.53 (1.65)
	Loss	3.55 (1.74)	2.86 (1.34)
	Personal control	21.41 (3.22)	21.75 (3.15)
	Infertility control	3.17 (0.58)	3.29 (0.48)
Distress	SCL-90-R Anxiety sub-scale	0.57 (0.67)	0.48 (0.53)
	SCL-90-R Depression sub-scale	0.87 (0.91)	0.72 (0.63)
	SCL-90-R Hostility sub-scale	0.68 (0.86)	0.54 (0.67)
	Infertility Specific Distress	2.03 (0.84)	1.82 (0.67)
Well-being	Well-being sub-scale: anxiety	4.95 (3.77)	3.82 (3.13)
	Well-being sub-scale: depression	4.77 (3.12)	3.92 (2.87)
	Well-being sub-scale: energy	6.98 (3.06)	7.45 (2.61)
	Well-being sub-scale: positive	10.31 (4.05)	11.84 (3.27)
	Well-being Total	43.86 (12.37)	47.56 (9.98)
	Infertility Specific Well-being	2.25 (0.70)	2.51 (0.64)

The relationships between the appraisals were examined for both MMF and MFF groups and these are displayed in Table 15. Threat, challenge and loss appraisals were related for both groups. Personal control was negatively associated with threat, and infertility control was negatively related to loss for both groups. For MMF personal control was negatively related to loss. Infertility control was related to personal control for the MFF only.

Table 15: Correlations of appraisals for MMF and MFF

	Group	1	2	3	4	5
1. Threat	MMF					
	MFF	-				
2. Challenge	MMF	.49 ***				
	MFF	.29 *	-			
3. Loss	MMF	.75 ***	.47 **	-		
	MFF	.64 ***	.38 **			
4. Personal control	MMF	-.39 **	-.13	-.43 **		
	MFF	-.40**	0.10	-.21	-	
5. Infertility	MMF	-.28	.03	-.31 *	.21	
	MFF	-.23	.21	-.29 *	.41 **	-

* p< 0.05 ** p<0.01 *** p<0.001

A step wise discriminant function analysis was performed to examine any differences between the coping styles employed by MMF and MFF. At step one in the analysis

seeking instrumental social support was included and mental disengagement was included at step two in the analysis. The two coping styles, seeking instrumental social support and mental disengagement, were found to be predictors which discriminated between the two groups ($\chi^2(3) = 9.004, p < 0.01$). T-tests were then computed for these two coping styles and these are illustrated in table 16.

Table 16: T-tests for seeking instrumental social support and mental disengagement

	MMF	MFF	t-value	P
	Mean (Sd)	Mean (Sd)	(Df)	
Seeking instrumental social support	8.83 (2.59)	10.23 (2.85)	-2.41 (87)	0.018
Mental disengagement	7.12 (2.02)	8.03 (1.84)	-2.24 (87)	0.028

Table 16 shows that MFF used both seeking instrumental social support and mental disengagement significantly more than MMF.

The mean scores for the coping strategies for MMF and MFF are provided in table 17. Both groups frequently used the coping strategies active coping, planning, and positive reinterpretation.

Table 17: Mean scores on coping strategies for MMF and MFF

	MMF Mean (Sd)	MFF Mean (Sd)
Active coping	11.50 (2.89)	11.62 (2.14)
Planning	11.45 (3.32)	11.65 (2.48)
Seeking instrumental social support	8.83 (2.59)	10.23 (2.85)
Seeking emotional social support	7.31 (2.29)	8.64 (3.24)
Suppression of competing activities	8.71 (2.17)	9.60 (2.51)
Turning to religion	7.00 (4.27)	6.45 (3.97)
Positive reinterpretation and growth	11.24 (2.69)	11.54 (2.67)
Restraint Coping	9.08 (2.98)	9.62 (2.91)
Acceptance	9.52 (3.16)	10.37 (2.52)
Focus on and venting of emotions	7.86 (2.64)	8.09 (2.19)
Denial	5.95 (2.14)	5.65 (2.33)
Mental disengagement	7.12 (2.03)	8.03 (1.84)
Behavioural disengagement	5.38 (2.08)	5.21 (1.66)
Alcohol/drug use	5.57 (2.91)	4.92 (1.38)
Humour	6.81 (2.95)	8.29 (3.27)

3.3.2 Question 3: What is the relationship between the appraisal of infertility and coping in relation to distress and well-being in men experiencing fertility problems?

Correlations were employed to look at the associations between the appraisal variables with the outcome measures, distress and well-being, both globally and specifically for infertility. Transformed variable correlations are reported in tables 18 and 19 which illustrate the associations between the outcome measures and the independent variables appraisal and coping for MMF and MFF. Table 18 shows that for both MMF and MFF, threat and loss appraisals were significantly associated with global and infertility specific distress and with global well-being. Challenge appraisals were only associated with distress for MMF. Correlations between the control appraisal measures and global well-being are apparent for both groups.

Table 18: Correlations of appraisal and distress and well-being for MMF and MFF

	Group	Distress		Well-being	
		Global	Specific	Global	Specific
Threat	MMF	.68 ***	.71 ***	-.56 ***	-.17
	MFF	.52 ***	.42 ***	-.50 ***	-.22
Challenge	MMF	.37 *	.31 *	-.15	.26
	MFF	.21	.25	-.26	-.03
Loss	MMF	.68 ***	.71 ***	-.58 ***	-.15
	MFF	.42 **	.56 ***	-.56 ***	-.18
Personal control	MMF	-.38 **	-.26	.37 *	.12
	MFF	-.07	-.23	-.29 *	.28 *
Infertility control	MMF	-.14	-.19	.18 **	.22
	MFF	-.24	-.37 **	.42 **	.12

* p< 0.05 ** p<0.01 *** p<0.001

Table 19 illustrates the associations of coping and distress and well-being. For MMF distress was associated with the coping strategies focus on and venting of emotions, denial, mental and behavioural disengagement and alcohol and drug use, whereas well-being was negatively associated with these same coping strategies. For MFF distress was highly correlated with focus on and venting of emotions and behavioural disengagement, and negatively associated with active planning. Well-being, however, was negatively correlated with the coping strategies focus on and venting of emotions and behavioural disengagement and positively with active coping and planning.

Table 19: Correlations between coping strategies and distress and well-being for MMF and MFF

Coping Strategy	Group	Distress		Well-being	
		Global	Specific	Global	Specific
Active coping	MMF	-.20	-.01	.25	.25
	MFF	-.25	-.44 **	.21	.40 **
Planning	MMF	-.14	.09	.20	.18
	MFF	-.00	-.14	.09	.35 **
Seeking instrumental social support	MMF	.03	-.06	.06	.13
	MFF	.05	-.11	.07	.24
Seeking emotional social support	MMF	.19	.11	-.12	-.04
	MFF	.19	.06	-.11	.07
Suppression of competing activities	MMF	-.04	.11	.04	.01
	MFF	.09	-.31 *	-.14	.16
Turning to religion	MMF	.20	.05	-.16	.12
	MFF	.75	.03	-.16	-.12
Positive reinterpretation and growth	MMF	.04	.07	.09	.32 *
	MFF	.15	-.01	-.06	.26
Restraint Coping	MMF	-.17	.03	.27	.11
	MFF	-.05	-.26	-.10	-.00
Acceptance	MMF	-.15	-.03	.24	.18
	MFF	.20	-.10	-.22	-.01
Focus on and venting of emotions	MMF	.51 ***	.47 **	-.39 **	-.03
	MFF	.44 **	.11	-.52 ***	-.16

Coping Strategy	Group	Distress		Well-being	
		Global	Specific	Global	Specific
Denial	MMF	.42 **	.38**	-.36*	.07
	MFF	.16	.29 *	-.19	-.08
Mental disengagement	MMF	.48 ***	.56 ***	-.40 **	.04
	MFF	.32 *	.21	-.23	-.06
Behavioural disengagement	MMF	.46 **	.43 **	-.38 **	-.18
	MFF	.50 ***	.33 *	-.39 **	-.40 **
Alcohol/drug use	MMF	.38**	.41 **	-.36*	-.23
	MFF	-.10	.03	-.04	-.06
Humour	MMF	.22	.17	-.11	.21
	MFF	.08	-.18	.05	.17

* p< 0.05

** p<0.01

*** p<0.001

3.3.3 Question 4. What are the differences between MMF and MFF in relation to distress and well-being and to what extent are these mediated by their appraisal and methods of coping with the situation?

Following preliminary analysis of the data, standard multiple regression analyses were conducted separately for MMF and MFF, with the outcome measures distress and well-being as the dependent variable and appraisal and coping scores as the set of independent variables. Tabacknick & Fidel (1989), suggest a bare minimum requirement for a ratio of cases to independent variables as 5:1. Eight independent

variables were therefore chosen to be included in the analysis. These were the appraisal measures threat, loss, personal control and infertility control. The challenge appraisal was omitted because the association was not as strong for this measure for both MMF and MFF. The coping strategies active coping, focus on and venting of emotions, mental disengagement and behavioural disengagement were included from the coping scale. Four standard multiple regression analyses were therefore carried out for both MMF and MFF.

Multiple Regression Analyses for MMF (see Appendix 10 for a diagrammatic representation)

For MMF a standard multiple regression of appraisal and coping variables on global distress was significant where, multiple $R = .84$, $R^2 = .70$ and adjusted $R^2 = .63$, $F(8, 33) = 9.73$, $p < 0.001$. The independent variables accounted for 63% of the variance in global distress. Only two of the independent variables contributed significantly to the prediction of global distress, threat appraisal ($\beta = .48$, $t = 3.18$, $p = 0.0032$), with a semi-partial correlation (sr^2) of 0.09, and the coping strategy focus on and venting of emotions ($\beta = .41$, $t = 3.67$, $p = 0.0019$) with a sr^2 0.10 (unique variability = 0.19; shared variability = 0.51).

A standard multiple regression of appraisal and coping variables on infertility distress was significant where, multiple $R = .83$, $R^2 = .70$ and adjusted $R^2 = .62$, $F(8, 33) = 9.44$, $p < 0.001$. The independent variables accounted for 62% of the variance in infertility distress. Two of the independent variables contributed significantly to the prediction of infertility distress, these being the threat appraisal ($\beta = .45$, $t = 2.95$,

$p=0.0058$), with a semi-partial correlation (sr^2) of 0.08, and the coping strategy focus on and venting of emotions ($\beta= .25$, $t=2.03$, $p=0.051$) with a sr^2 of 0.04 (unique variability = 0.12; shared variability = 0.58).

The independent variables appraisal and coping were significant in predicting global well-being where multiple $R = .70$, $R^2 = .49$ and adjusted $R^2 = .37$, $F(8, 33) = 4.03$, $p<0.002$, accounting for 37% of the variance. The coping strategy focus on and venting of emotions was the only independent variable found to contribute (negatively) to the prediction of global well-being ($\beta= -.34$, $t=-2.15$, $p=0.039$) with a sr^2 of 0.07.

No significant differences were observed for the prediction of infertility well-being on the basis of the independent variables in this multiple regression.

Multiple Regression Analyses for MFF (see Appendix 11 for a diagrammatic representation)

For MFF a standard multiple regression of appraisal and coping variables on global distress were significant where, multiple $R = .82$, $R^2 = .67$ and adjusted $R^2 = .60$, $F(8, 38) = 9.65$, $p<0.001$. The independent variables accounted for 60% of the variance in global distress scores for this group. Five of the eight independent variables contributed significantly to the prediction of global distress, these being the threat appraisal ($\beta= .60$, $t=4.28$, $p=0.0001$), with a semi-partial correlation (sr^2) of 0.16, the personal control appraisal ($\beta= .55$, $t=4.23$, $p=0.0001$) with a sr^2 of 0.16, and the coping strategies active planning, predicting negatively, ($\beta= -.43$, $t=-3.46$, $p=0.013$)

with a sr^2 of 0.10, focus on and venting of emotions ($\beta = .32$, $t = 2.30$, $p = 0.027$) with a sr^2 of 0.05 and finally behavioural disengagement ($\beta = .32$, $t = 2.48$, $p = 0.018$) with a sr^2 of 0.05 (unique variability = 0.52; shared variability = 0.15).

A standard multiple regression of appraisal and coping variables on infertility distress was significant where, multiple $R = .78$, $R^2 = .60$ and adjusted $R^2 = .52$, $F(8, 38) = 7.17$, $p < 0.001$, accounting for 52% of the variance of infertility distress. Only two of the independent variables contributed significantly to the prediction of infertility distress, loss appraisal ($\beta = .14$, $t = 3.11$, $p = 0.0035$), with a semi-partial correlation (sr^2) of 0.10, and negatively with the coping strategy active planning ($\beta = -.43$, $t = -3.14$, $p = 0.0033$) with a sr^2 0.10 (unique variability = 0.21; shared variability = 0.40).

The independent variables appraisal and coping were significant in predicting global well-being where multiple $R = .78$, $R^2 = .61$ and adjusted $R^2 = .52$, $F(8, 38) = 7.31$, $p < 0.001$. The independent variables accounted for 52% of the variance in scores of global well-being. Three of the independent variables contributed significantly to the prediction of global well-being, the loss appraisal, predicting negatively ($\beta = -.37$, $t = -2.62$, $p = 0.013$) with a sr^2 of 0.07, and the coping strategies active planning ($\beta = .28$, $t = 2.08$, $p = 0.044$) with a sr^2 of 0.05 and focus on and venting of emotions predicting negatively ($\beta = -.43$, $t = -2.88$, $p = 0.007$) with a sr^2 of 0.09 (unique variability = 0.20; shared variability = 0.40).

No significant differences were observed for the prediction of infertility well-being on the basis of the independent variables in this multiple regression.

4. Discussion.

4.1 Overview

Appraisal, coping and adjustment were examined in a group of 147 men in couples experiencing infertility. This chapter provides, firstly a summary of the research questions and the main findings. The discussion then centres on the findings from the comparison study investigating differences between men in couples with a male factor diagnosis (MMF; $n = 42$) and those where there is a female factor diagnosis (MFF; $n = 47$). These findings are interpreted in the context of the research questions and relevant literature. The limitations of the study are presented, further research ideas suggested and the clinical implications of this present research are then discussed.

4.2 Summary of the findings

Question 1. How do men in infertile couples appraise, cope and adjust to infertility, irrespective of the location of cause?

Higher levels of anxiety, hostility and depression were reported in the sample than are observed in the general population. However, they also reported good psychological well-being. Infertility was appraised as having potential threat and loss yet as carrying some challenge. Perceptions of general control were high and participants felt they had a certain amount of control over their fertility problems. Problem focused coping strategies were used, such as planning, active coping and seeking instrumental social support as well as emotion focused strategies (positive reinterpretation and growth

and acceptance). In the present study men in infertile couples reported similar levels of appraisal, coping, distress and well-being as men in other studies of infertility.

Question 2. What are the differences between MMF and MFF for appraisal, coping and adjustment to infertility?

There was greater similarity between these groups than might, at first sight, have been expected. Both groups reported similar levels of global and infertility-specific distress and well-being. However, over one third of each group scored higher than the general population for anxiety, depression and hostility, as measured by the SCL-90-R.

Similarities were also seen between the two groups in their general levels of primary appraisals for threat, challenge and loss. The prediction that men would view their fertility difficulties in terms of both a threat and a loss was upheld, although these scores fell below the midpoint of the scale indicating that in general they were not that strong. However, the findings did not support the prediction that threat would be more salient for MMF rather than MFF. Appraisals of high threat were related to high challenge and high loss for both groups and no differences were seen on the secondary appraisals (personal control and infertility control). Low perceptions of threat were associated with high personal control and low perceptions of loss were correlated with high perceptions of control over their fertility problems.

In relation to coping styles, the seeking of instrumental social support and mental disengagement were predictors which discriminated between the two groups with MFF being engaged more in these styles of coping than MMF .

Question 3: What is the relationship between the appraisal of infertility and coping in relation to distress and well-being in men experiencing fertility problems?

Appraisal and adjustment: The study identified that psychological distress was more likely, both globally and in relation to their infertility, for those men in both groups who appraised infertility as highly threatening, or as a great loss. Men who appraised their fertility problems as having low perceived threat and loss reported greater well-being, and this supported the prediction. Viewing infertility as a challenge was expected to be associated with well-being and less distress. Challenge appraisals were found to be unrelated to distress and well-being for MFF. Unexpectedly, the results demonstrated that appraising infertility as highly challenging was predictive of distress for MMF but not for MFF. This finding differs from other research findings (e.g. Stanton et al, 1991) and is discussed in a later section.

With secondary appraisals, those MMF men who felt they had low personal control (general control measure) experienced more global distress. For MFF the perception of limited control over their fertility problems was associated with infertility-specific distress. In both groups, well-being was associated with high perceptions of control over their infertility. High perceptions of personal control were also related to well-being for MMF. These findings support the prediction that high control perceptions

would be associated with better well-being and less distress. However, for MFF low personal control related to feelings of well-being (and discussed in section 4.3.1.2).

Coping and adjustment: Both groups of men frequently employed the coping strategies of active coping, planning and positive reinterpretation and growth. For MMF only, positive reinterpretation and growth was associated with well-being (infertility-specific), while for MFF active coping and planning were positively associated with well-being. Focusing on and venting of emotions, denial, mental and behavioural disengagement and the use of alcohol and drugs correlated positively with distress (both globally and specifically) and negatively with global well-being for MMF. Focusing on and venting of emotions and behavioural disengagement correlated positively with distress and negatively with well-being for MFF. These findings support the prediction that men who cope through escape-avoidance and focusing on emotions will suffer greater distress and less well-being.

Question 4. What are the differences between MMF and MFF in relation to distress and well-being and to what extent are these mediated by their appraisal and methods of coping with the situation?

Regression analyses found that for MMF a high appraisal of threat and focusing on and venting of emotions were the unique predictors of global distress and infertility-specific distress. For MFF, however, a wider range of appraisals and coping styles, including high threat appraisals, high personal control, focusing on and venting of emotions, behavioural disengagement and the absence of active planning were all predictors of global distress. It was found that the most powerful predictors of global

distress in MFF were high threat appraisals and high personal control whereas infertility-specific distress was predicted by high loss appraisals and the absence of active planning. From the unique and shared variability figures it was apparent that the independent variables chosen for the regression overlapped more for MMF than for MFF on the outcome measure distress.

Global well-being was best predicted by an absence of focusing on and venting of emotions for both groups, with low appraisals of loss and active coping being additional factors for MFF.

To summarise, the levels of distress and well-being were similar for both groups. However, different strategies adopted by the two groups were predictive of their levels of distress or well-being. This is illustrated in diagrammatic form in Appendices 10 and 11. The extent to which the independent variables overlap between the two groups probably explains the different patterns of the effects observed in the multiple regression.

4.3 Discussion of the findings

The findings are examined in three main sections; appraisal, coping and adjustment. The discrepancies between the medical diagnosis and participants' own perception of their infertility are then considered.

4.3.1 Appraisal

4.3.1.1 *The role of primary appraisal (threat, loss and challenge)*

Glover (1996) and Hurst et al (1999) both referred to the appraisal of threat as potentially having an important role to play for men whose fertility is compromised, although their work did not directly evaluate this. This present research confirms that the appraisal of threat does indeed seem to be important in predicting distress for MMF, both globally and specifically for infertility. The finding that threat is an important predictor of distress in MMF, rather than loss, may suggest that only when the threat has been reduced is it possible to think ahead to the losses, since the threat is too overwhelming to allow other emotions to be acknowledged and processed (Glover et al, 1996a). The finding that focusing and venting on emotions is the other powerful predictor of distress provides additional support for this assertion and is further discussed in section 4.3.2.

Threat, however, is also an important predictor for MFF in relation to global distress, but it does not predict infertility-specific distress. The measure of threat used in this research assesses quite general aspects of threat regarding the couple's relationships, life goals and physical health, and actually contains no question specific to manliness or sexuality. The measure was developed for work with infertile couples where the man's experience was not the major concern. Close examination of the questions from the loss measure (specifically designed for the purposes of this research, with the man in mind) relating to masculinity and sexual spontaneity, revealed that MMF showed much higher scores than MFF although no differences between the two groups were observed for the total loss score. This lends some support to previous

assertions that manliness may be threatened by the inability to make a partner pregnant (Glover et al, 1996a) and that 'male factor sub-fertility threatens the traditional male/father role, resulting in a feeling of personal and sexual inadequacy'. (Irvine & Cawood, 1996, p113). It could be hypothesised for MFF that, although his manliness is not directly threatened, the man's potential role of fathering a child with his current partner is undoubtedly threatened. However, it is clear that the threat and loss measures need to be adapted and developed further in order to adequately assess these assumptions and increase our understanding of men's appraisals of infertility.

This is the first study to comprehensively include items about the appraisal of loss in the study of men's experiences of infertility. This has important clinical implications for counselling men, where a bereavement framework is often assumed (Lee, 1996), and loss is implicit in this model. Research has found that loss is important for infertile women where a bereavement approach may be more appropriate (Crawshaw, 1995; Jennings, 1995). The current study found that the appraisal of loss predicted infertility-specific distress, (but not global distress), and the absence of loss appraisal predicted global well-being, but only for MFF. It is interesting to note that a low appraisal of loss is such a strong predictor of a sense of well-being in MFF. Given that the man still has the ability to procreate, a highly speculative explanation for this finding could be that he envisages alternative options which could indicate that he does not view the couple's infertility as a loss. He may feel that it is the ability to reproduce that is important, not necessarily carrying it out.

Loss has been implicated as a predictor of adjustment for men in infertile couples but it does not appear previously to have been empirically evaluated. From the findings in this study the bereavement model does not seem necessarily appropriate for all infertile men. For MFF, loss appears to play a role in determining adjustment but this warrants further investigation.

It has been hypothesised that individuals who do not see any challenge arising from infertility might be particularly likely to experience distress. For example, Stanton (1991) found that those women in infertile couples who saw infertility as carrying potential benefits (such as strengthening their relationship), were highly challenged by their infertility, and were less distressed, but this was not the case for men. The current study, however, identified that MMF who see their infertility as a high challenge, i.e. they can see some benefits of infertility, nevertheless suffered distress. It can be argued that a MMF may view his infertility as a personal challenge, where the man's identity may be affected, and this challenge may also be thought of as a threat, or as unmanageable. MFF on the other hand may see infertility as a more global challenge, and are able to take a more positive approach.

4.3.1.2 The role of secondary appraisal (perceived control).

As expected, high control perceptions were associated with greater well-being and less distress. Men who perceived themselves as having high personal control (generalised beliefs about control) experienced less threat, and men with high perceptions of control over their infertility (situation specific appraisals of control)

were less likely to experience infertility as a loss. Perceived control, in general, appears to be adaptive.

There is a high correlation between infertility control and general control for MFF but not for MMF. Glover (1996) on the other hand, found a high correlation between infertility control and general control for a group of infertile men. One explanation for this association may be that MFF can relate their experiences of infertility to other situations which they perceive as controllable. Furthermore, they may feel more in control because it is not their medical problem. For MMF, however, personal control and infertility control were unrelated. This is consistent with the findings of Miller Campbell et al (1991) in infertile women.

A loss of control is usually associated with distress. However, for MFF a high level of perceived personal control was important in predicting global distress, while well-being was associated with low perceptions of personal control. Perceived control has been shown, in several studies, to be adaptive, where greater control can reduce negative reactions to stress (see Averill, 1973, Thompson, 1981, for reviews). However, as noted by Miller Campbell et al (1991), other researchers have considered the possibility that perceived control may not always be beneficial. For example, Wortman & Brehm (1975) argued that it may be maladaptive to perceive control in a situation where none exists, where acceptance may be more adaptive. MFF men who have high perceptions of personal control experience distress and this may be due to the limited control they actually have in the situation. They have already been investigated and no medical problem has been identified with them. However, low

perceptions of infertility control would then be expected to be predictive of distress for MFF and this was not established in the research findings. The higher levels of distress may arise because the fertile man might be seen as the one in control in the relationship. He may be taking control, not just for himself, but also their relationship. Exercising control, however, may require the expenditure of resources that could be needed elsewhere. These are tentative explanations and further research is needed. Studies of men in infertile couples are particularly under-researched and this unexpected finding illustrates the importance of studying both members of the couple. All these findings support the need for in-depth qualitative studies to further our understanding of the appraisal process in relation to infertility.

4.3.2 Coping

Men in both groups reported frequently using problem focused strategies. It may be that while couples are pursuing treatment the men see that there is a goal to work towards and treatment decisions to be made. The use of these strategies was not found to correlate with either distress or well-being for MMF which is inconsistent with the findings of Glover (1996). Active coping, however, was found to be particularly important for MFF in predicting well-being and the reduction of distress. Specifically when the medical problem is located with their partner, they may see involuntary childlessness as a problem to be solved.

It is interesting that MFF are more likely to seek social support and to mentally disengage from the problem of infertility than are MMF. It may be hypothesised that for MMF it is more difficult to mentally disengage from the problem due to their

greater personal involvement in the medical cause of the infertility. When the medical cause lies with the woman, mental disengagement is achieved much more readily by the man, where infertility may be perceived as not as much 'his' problem. Furthermore, seeking social support was a coping style more likely to be employed when the location of cause was with the woman. Again it can be hypothesised that when the infertility does not lie with the man, he finds it less problematic getting advice, talking to someone to find out more about the situation, sharing information with people who have had similar problems, and being more open about the problem. However, when the infertility is a male factor problem these kinds of discussions are much more difficult. This is in line with other research findings that MMF often feel marginalised by their experiences and do not seek social support as readily (e.g. Mason, 1993; Slade et al, 1992). In situations which threaten self-esteem, people are less likely to seek social support. Given the stigmatising nature of male infertility and the perceived threat to masculinity, men may also wish to keep their fertility problem a secret thus isolating themselves from potential sources of support. Further scrutiny of the coping strategies reveals that although no significant differences were found, humour was a style with a higher mean score for MFF. It may be easier to see the lighter side of the situation when your partner is the one with the identified cause. However, if it is your problem it is much more difficult to use humour as a way of coping. This finding that MFF used more social support and avoidance is consistent with Stanton's (1991) findings for women in infertile couples.

Carver et al (1989) argue that focusing and venting of emotions, behavioural disengagement and mental disengagement are ineffective in modulating distress. This

was particularly apparent in the findings for MMF and was consistent with Glover's (1996) findings that infertile men who focused on and vented their emotions were more distressed. From the results of the current study, this coping strategy together with the appraisal of threat were the strongest predictors of distress for MMF. This was also true for MFF but the associations were not as strong. It may be that men who focus on their emotions feel overwhelmed and unable to manage them rather than feeling in control. Possibly they are experiencing their emotions rather than processing them, since there is a difference between being very aware of your emotions and re-experiencing them, and actually processing them. Emotional processing is described by Rachman (1980) as 'a process whereby emotional disturbances are absorbed, and decline to the extent that other experiences and behaviour can proceed without disruption'. He suggests that difficulties in processing may occur if there are unpredictable or uncontrollable factors relating to the cause of the distress and that a failure to achieve emotional processing can result in continued distress. As long as there is ambiguity about the outcome, individuals may not be successful in processing emotions relating to their infertility. Distress about infertility for MMF may be reduced if they can start to process their emotions, rather than feeling overwhelmed by them. As noted by Glover (1996), 'simply being aware of feelings about a situation does not in itself lead to any kind of resolution; it is important to address cognitions in order to change emotions'.

A further aspect of the relationship between distress and the focusing on and venting of emotions is that men may perceive the expression of their own feelings as less appropriate or acceptable. This could be particularly important when the feelings

expressed are about an issue which may be seen as a threat to manliness (Glover, 1996). The findings support this argument where both threat and focusing on emotions were the two predictors of distress for MMF.

Lazarus (1993) argues that there are no purely adaptive or maladaptive coping styles, just that some may be more helpful or adaptive more of the time. Hurst et al (1999) found that sub-fertile men employed more coping resources than fertile men and suggest that this may account for the similar levels of stress reported by the two groups in their study. Furthermore, Hurst et al (1999) hypothesise that the presence of a threat to masculinity, posed by male factor infertility, is one way of understanding the enhanced use of coping strategies in this group. The current study found similar distress levels for both MMF and MFF, but did not find that MMF used more coping strategies. Although differences in coping styles were found, they were contrary to the findings of Hurst et al (1999), where it was MFF who used more of the coping styles seeking social support and mental disengagement.

Distress levels in the present study were associated with different coping styles for MMF and MFF. The coping styles (focus on and venting of emotions, denial, mental disengagement, behavioural disengagement and alcohol/drug use) employed by distressed MMF may be seen as less adaptive or useful, whereas for MFF, although they engaged with a couple of these styles of coping (focusing on and venting of emotions and behavioural disengagement), an absence of problem focused styles was shown to be associated with distress (active coping). This was not the case for MMF. The same pattern emerges when looking at predictors of well-being. Well-being for

MMF is associated with the lack of, what Carver et al (1989) term, “unuseful styles” and the presence of problem solving styles that are related to well-being. It appears that, even though MMF used focusing on and venting of emotions, much of the additional coping they employed was avoidant. This style is generally less effective in reducing stress. Both groups use this avoidant behaviour, which constitutes a psychological risk factor linking negative health responses to stressful life events (Holahan & Moos, 1986). However, when men in infertile couples experience distress, MMF use more avoidant coping. This finding provides evidence for the detrimental consequences of avoidant coping.

There is considerable research evidence that a male factor diagnosis presents a couple with particular difficulties (e.g. Connolly et al, 1992; Mikulincer et al, 1998). From the current findings on men’s use of coping styles, it can be seen that MFF use similar coping strategies to those commonly reported in infertile women. It may be that the coping strategies adopted by MFF relate to their partner’s coping style possibly enhancing their relationship and the couple’s approach to their infertility. For MMF their particular strategies for coping with infertility are such that they may promote differences of approach by the couple concerned. This could provide a possible explanation for the reported difficulties found for couples with a male factor diagnosis. The coping styles of the couple’s infertility was not explored in the current study which focused on the responses of men. Further examination of the interaction of coping styles in the context of the couple and their relationship is required.

4.3.3 Levels of distress and well-being

Previous studies have reported that infertile men are highly distressed (Kedem, 1990), and this is expressed particularly in the form of anxiety (Glover et al, 1996a). The current findings support the view that men in infertile couples are distressed but indicates that they experienced as much depression and hostility as anxiety. Glover et al (1996a), hypothesise that high levels of anxiety reflect an experience of threat whereas the literature suggests that for infertile women it is one of a loss, in which this is reflected in the high levels of depression found for this group. The present findings show that men in infertile couples experience both. However, because the three scores of anxiety, depression and hostility were aggregated to make a global composite score the effects of high levels of anxiety and depression were not analysed in relation to men's appraisals. The link between threat and anxiety, loss and depression warrants further investigation.

Stanton (1991) and Campbell et al (1991) have suggested the need to focus on well-being as well as distress in order to understand the mechanisms that ameliorate distress and facilitate well-being. Stanton (1991) found that different coping strategies predicted distress and well-being. The current findings are inconsistent with this argument, and showed that coping strategies that were positively associated with distress are generally negatively associated with well-being and vice versa. Different coping strategies were therefore not associated with well-being and distress. However, it is important to examine both positive and negative feelings associated with infertility.

The finding of similar levels of distress in MMF and in MFF is in line with two other studies comparing men's responses to male factor and female factor infertility (Boivin et al, 1998; Hurst et al 1999). Hurst et al (1999) found no differences in levels of perceived stress between fertile and sub-fertile men. Boivin et al (1998) also found similar levels of distress in men undergoing ICSI (male factor diagnoses) and men undergoing IVF (predominantly female factor diagnoses) and felt there was no need to differentiate these patients on a psychological dimension during infertility treatment. However, Boivin's work focused only on distress levels, and not on the appraisal and coping strategies which men adopted. The present findings, although demonstrating similar distress levels, suggest that MMF and MFF used different appraisals and coping strategies. This does not support Boivin et al's (1998) assertion that the two groups of men should be treated similarly.

Previous studies, for example Connolly et al (1992) and Nachtigall (1992) have provided evidence of greater distress and reports of negative feelings in men with a male factor diagnosis than men where there are other diagnoses. As Boivin et al (1998) importantly highlight (see also section 1 & 4 in the introduction), ICSI was not an available treatment option when these earlier studies were conducted, and donor insemination would have been the most frequently offered medical treatment. The studies reporting such differences were conducted at a time when treatments did not circumvent the man's infertility. Donor insemination offers men the possibility of being a father but not fathering their own child. ICSI provides this second possibility, and Boivin et al (1998) found that men's optimism about a pregnancy was the same for both the ICSI (i.e. male factor) and IVF (i.e. female factor) groups. This could

provide an explanation for the similar levels of adjustment found for MMF and MFF in the current study.

4.3.4 Ownership (agreement).

It emerged from the study that men's perceptions of the medical cause of infertility did not always agree with the medical diagnosis. This was particularly evident for those with a diagnosis of female factor, a joint factor or an unexplained cause. When the medical diagnosis was a female factor nearly half the group rated the problem as either a joint or unexplained cause. This appeared to be unrelated to their appraisal, coping and adjustment to infertility, for either MMF or MFF. So despite discrepancies in the attribution of cause between the medical diagnosis and the men's perception, no effects were seen on the methods of appraisal, coping and adjustment to infertility.

The discrepancies between men's own perception of the couple's infertility and the medical opinion has implications for medical practice and can be understood by reference to Glover et al's (1996b) work which examined differences between doctor and patient estimates of outcomes in sub-fertile men. Where there is a threat to the individual, or the couple, biases become apparent as the perception of threat to the self or the couple increases and as the importance of the situation increases (Taylor & Brown, 1988). Information given in a consultation is subject to patient interpretation and bias depending on the nature of the problem and its implications for the patient. Glover et al (1996b) found that, following consultation, male factor patients' perceptions of their chances of pregnancy were often inaccurate and were more often

influenced by their own expectations than by the consultant's view. It may be that MFF have difficulty in fully comprehending the situation and either take more responsibility themselves (i.e. they assume the infertility as a joint problem) or place less responsibility on their partner (i.e. assume the cause of infertility to be unexplained). These perceptions may be important for the couple's relationship at that time. If the man places all the medical responsibility in his partner this may be detrimental to their relationship. The group of MFF men for whom discrepancies were found with the medical opinion were, in the main, recruited from the clinic. The inconsistent view held could be a way of justifying clinic attendance and provide a role for the man in the couple's fertility problems.

The discrepancies shown may also indicate a misunderstanding of the medical information provided. It is possible that the men did not attend all the consultations, given the amount of investigation that the female requires, and may get information second-hand from their partner who, in turn, may perceive the medical cause differently. This study could not examine these issues and further research is required comparing the medical opinion with the couples understanding of their fertility difficulties. Until then, conclusions must be treated cautiously.

An important role of the medical consultation is to provide patients (or couples) with prognostic information so that they can assess their situation and make fully informed decisions about treatment. The findings for MFF suggest that many of them have not gained an accurate understanding of their fertility problems. There may be many explanations for this finding but, due to the unanticipated discrepancies found for this

group, further investigation is an important next step. There are important implications for clinical practice, particularly the extent to which efforts should be made to change people's perceptions of the medical diagnosis.

Ownership of location of cause was examined by Hurst et al (1999) who found that a small subset of six men (out of 25) reported that their partner was sub-fertile, even though semen analyses indicated they were themselves sub-fertile. It is not clear whether the reasons for this are a failure to understand the information presented, due to ignorance or what Hurst et al (1999) term 'denial'. These six sub-fertile men showed increased use of coping strategies compared with other sub-fertile men, indicating that the denial of ownership may be important in some sub-fertile men's experiences of infertility. However, this current study found that for MMF, when ownership was denied ($n = 7$), no differences were observed on any of the measures of appraisal, coping and adjustment scores. This finding does not support Hurst et al's (1999) conclusion that denying ownership for men with a male factor will be detrimental.

4.4 Limitations of the study

4.4.1 Generalisation

The possible generalising of these findings to other groups of men experiencing infertility must be treated cautiously due to the self selecting nature of the study. Although a high proportion of those approached agreed to take part in the study, a proportion of the men in infertile couples chose not to. It is uncertain whether there

were any differences between those who took part and those who did not. A comparison of responders and non-responders for selected background information and clinical variables suggests that the infertile group investigated were representative of the total sample surveyed. Previous research has focused almost exclusively on individuals who present to services (Wright et al, 1989), and little is known about those who drop out of treatment (Berg, 1994). Seeking treatment in itself may reflect appraisals and coping strategies and the findings may therefore have only limited applicability to those who do not seek medical intervention or to those who have stopped their treatments.

The research was conducted at a large London teaching hospital. To have involved a greater number of fertility clinics at different hospitals in a wider geographical area would have improved the external validity of the findings, since services are known to vary in different locations and this should be taken into consideration. In this study a large proportion of the sample originated in the UK and this may limit the study's external reliability since cultural differences could not be taken into account. Furthermore it may be more accurate to obtain participants' own categorisation of their ethnicity rather than their country of origin. Other socio-demographic variables, such as employment and financial difficulties were not explored in the current study.

4.4.2 Measurement

The present study relied on self-report measures and it is possible that respondents may have presented themselves in a favourable light. However, the fact that they reported highly personal and painful information suggests that this was not a

significant factor. Additional assessment methods may be needed to investigate the processes involved.

There is a concern that the measures used for the reporting of distress levels may not be sufficiently sensitive, or indeed, asking the appropriate questions. The literature on men in infertile couples indicates that distress is hard to identify, although approximately one third of men for MMF and MFF reported higher levels of anxiety, depression and hostility than would be expected in the general population. Examining the more subtle differences in distress may be more informative for clinical interventions, where looking specifically at the link between the appraisals and coping styles associated with both anxiety and depression may be beneficial.

This study involved the measurement of a large number of domains and this raises the possibility of inflating type 1 errors, where a difference is accepted as significant when in fact it is not. The number of t-tests employed increased the risk of potential type 1 errors,. However, no significant differences were observed for the t-tests.

4.4.3 Design

The MMF group combined men with a male factor and men where there was a joint factor but which was mainly identified with the man. It could be argued this did not amount to an homogenous group. Here, however, the MFF group was deemed to be homogenous in the sense of the medical diagnosis.

The researcher's cross-sectional design could be a potential limitation. This design allows for an assessment of the situation for men in infertile couples at one point in time only, and there is not a one way causal link between appraisal and coping and adjustment. Coping responses may be either the cause or the consequence of a particular psychological or physical state and it is important to establish the causal pathway of any association between coping and, for example, mood. A cross-sectional study cannot disentangle cause and effect. Further research using longitudinal designs would be required to investigate this complex relationship. Correlational statistics can make only causal inferences about the relationships between variables, so it was impossible to extend the strength of the associations between variables to develop inferences about causality. A longitudinal design would be able to measure appraisals and coping at different points in time and therefore could address issues of causal inference adequately, providing invaluable insights into long term coping and the effects of different appraisal and coping strategies on adjustment to infertility. Time and resource constraints prevented the use of a longitudinal design here.

There is a lack of longitudinal and prospective designs which can demonstrate the causal relationship between the experience of infertility and any subsequent stress reactions. Cross-sectional studies can effectively contrast infertile individuals at different stages, but few studies focus on the influence of the length and stage of treatment, the effects of time and trying time affecting psychological functioning (Berg, 1994). It was not within the scope of this study to fully take into account the duration of infertility. The effectiveness of one's coping efforts may vary as a

function of how long the problem has persisted and the differing importance of the various adaptive tasks posed by infertility. The findings must be evaluated carefully in thinking about their applicability to a man's specific situation. The stage the investigation has reached would warrant its own investigation in relation to men's experiences of coping with infertility. Furthermore the experience of infertility may be influenced by the medical investigations, for example the production of semen samples. The influence of the investigations themselves was not thoroughly examined.

The majority of studies investigating infertility have employed a quantitative methodology. Although there are many benefits from replicating studies using this methodology there are also shortcomings in that the standardised measures used impose a pre-ordained structure and create a rigid format for data collection. Qualitative methods allow the researcher to understand how the respondent interprets the information and can produce findings that are not expected or preconceived. Qualitative methods can explore more fully the complexities and intricacies of the infertile world (Berg, 1994).

4.5 Suggestions for further research

There is no doubt that a fuller understanding of men's response to infertility is required. Qualitative research provides a wealth of information, giving in depth information regarding men's experiences of infertility and this may well be a way forward in appreciating distress in men and their appraisals of infertility. Very few

studies have been conducted yet in the area of the appraisals of threat, challenge and loss in men taking account of the location of the cause of infertility.

The remarkable finding from this research is that, for MMF a high rating on the loss measure, although associated with distress, was not a significant predictor of either global or infertility specific distress. This calls into question the use of a bereavement model when counselling male infertility in which loss is a fundamental component. It is apparent from the current findings that a more salient issue is threat. However, this requires much more research into the understanding of the role of threat.

The measure used for the assessment of loss was developed to focus on the man's experiences of infertility and the questions focused on issues of masculinity and sexuality. This measure needs further validation, particularly in respect of the categorisation of these responses as those of threat and loss. It may not be adequate to distinguish these appraisals simply by including the words threat and loss at the beginning of the questionnaire.

The differences observed in the regression analyses for MMF and MFF may reflect the extent to which the appraisal measures and coping styles overlap for each group. The unique and shared variability figures indicate that for MFF there is less overlap between these dimensions than for MMF, particularly for the outcome measure of global distress. A larger scale study needs to be undertaken employing a factor analysis to examine the underlying dimensions that are important for both MMF and MFF.

In attempting to understand some of the findings, many assumptions have been made where more in-depth research is warranted to find evidence to accept or discard them. In order to unravel the relationships between threat, loss and challenge it is necessary to compare these existing measures with new adapted measures to see if the inclusion of different questions provides a more sensitive predictor of distress and well-being. For example, including questions about masculinity and sexuality in the threat measure may provide a more powerful predictor of distress in MMF. It may be helpful if the questions for the three aspects of primary appraisal (threat, loss and challenge) related to participants relationship and life in general with a separate set of questions which are more specifically about themselves. This may give a fuller understanding about how men in infertile couples appraise the experience, and help to provide further information about the two groups, their similarities and differences.

The current findings, while enhancing the understanding of men in infertile couples did not explore the dynamics of the impacts on the couples relationship. Further research into the man's experience of infertility is still needed as well as considering the effects on the couple. It is important for future research to examine the location of cause in the context of the interaction of the couple's experiences of infertility in order that results are not inaccurately attributed to gender differences. As mentioned, in the introduction, when investigating infertile couples it is paramount that gender is separated out from the impact of the partner who is diagnosed with the infertility. This is an area for further study.

4.6 Clinical implications

Models which focus on beliefs and cognitions that address some of the appraisals possibly causing distress may be beneficial for individuals in infertile couples. This distress may not always be experienced as depression. It is clear from the current findings that men in couples experiencing infertility do not just feel depressed but also anxious and hostile. Infertility counselling traditionally considers infertility as fundamentally an experience of loss. In bereavement theory, depression is seen as a normal reaction to loss, a stage in the process of grieving and a psychological symptom needing to be worked through in order for the feelings to be resolved. This raises questions about the value of the bereavement model in counselling this group.

Hunt & Monach (1999) suggest that an important avenue in infertility counselling is to provide interventions at a cognitive behavioural level. However, they assume that depression and loss are the fundamental components of the intervention. It may be just as important to examine anxiety and its role in infertility. Hunt & Monach's (1999) opinion, which does not appear to be based on empirical evidence for men in infertile couples, is not supported by the current findings on two levels; firstly threat appears to be more salient than loss in predicting distress for MMF, and secondly that men are not just experiencing depression. Assumptions that infertility is an experience of loss, and therefore depression, seems surprising given the current culture of 'evidence based practice'. It may alienate those individuals who seek help and who do not experience infertility in the way a bereavement approach assumes. However, this is not to say that a bereavement framework is always unhelpful in counselling.

Specific adaptive tasks associated with infertility should be the subject of further research. The experience of infertility poses different challenges for different people and a variety of coping strategies are required for their resolution. For some people, interpersonal negotiations may be the primary task, whereas for others it may be important to make sense of an unexpected event which impacts on their life goals. In addition, different coping demands may arise at particular points in the process, while the experience of infertility is evolving and requires continued investigation. Impaired fertility represents an ambiguous situation where nothing specific has actually occurred (Tennen et al, 1991). Those involved do not know if they are facing permanent infertility. A period of distress may be required for subsequent adaptation. It could be concluded from this study that men should be discouraged from focusing on and venting their emotions, and active coping and planning should be encouraged. However, it is important to learn more about those appraisal and coping strategies that enhance adaptation before reaching these conclusions.

An important role of research is to provide further understanding and inform clinical practice. It is clear from the current findings that the experience of infertility is complex and that there are no simple causal pathways. It is crucial that no assumptions are made and that individuals and couples are thoroughly assessed psychologically in order to inform the clinician which intervention would be beneficial. Infertility is an extremely distressing experience, and there is a requirement for more objective evidence to inform the clinical practice and the psychological services offered to couples with infertility.

4.7 Summary

Levels of adjustment found in this study were similar for both MMF and MFF, and this supports recent findings. Adjustment was best predicted, however, by different variables for MMF and MFF. For MMF distress was associated with threat and the overwhelming feeling of emotion (focus on and venting of emotions). For MFF a greater variety of appraisals and coping strategies were predictive of distress and well-being. It is clear from the research findings that coping processes differed, with MFF being more likely to cope through seeking instrumental social support and mental disengagement than MMF men.

Infertility is a distressing experience for men in infertile couples regardless of the location of cause. Although much has been written to help couples, researchers have directed very little systematic study to understand the ways by which men actually appraise and cope with infertility and whether these strategies serve to enhance or hinder emotional adjustment. The primary appraisal of threat, challenge and loss as well as the secondary appraisal of control are clearly complex and multifaceted. However, the evidence is still sparse and more thorough, perhaps qualitative, investigation is required. The inclusion of both primary and secondary appraisal in the examination of stress and coping for men in infertile couples contributes to the empirical base for clinical intervention.

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