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The Couple Relationship and Adjustment Following Prenatal Genetic Testing For Advanced Maternal Age in Women With Normal Test Results

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ABSTRACT

Two studies were undertaken to explore how aspects of the couple relationship might play a role in women's experience of prenatal diagnosis (PND). Both studies involved women referred to the Children's Hospital of Eastern Ontario (CHEO) for prenatal genetic counseling due to advanced maternal age (AMA). The first study examined the role of the partner during the genetic counseling session by comparing 123 women who attended the session alone with 222 women accompanied by their partners, on the basis of self-report measures completed immediately prior to and following the session. Accompanied women reported somewhat higher levels of state anxiety and PND-related decisional conflict before the session than did those who attended alone ($p<.05$). The presence of the partner could thus reflect a support-seeking coping strategy employed by women to cope with feelings of indecision and anxiety surrounding the issue of prenatal diagnosis. Alternatively, it is possible that attendance by the partner contributed to anxiety and uncertainty among women.

The second study sought to clarify the reasons for partner attendance or non-attendance at the genetic counseling and testing appointments, and to explore how certain relationship variables might relate to women's individual and marital adjustment following PND. Ninety-five women completed self-report measures prior to genetic counseling (Time 1), during the waiting period for PND test results (Time 2), and after normal results were known (Time 3). Many women reported that their partners attended the appointments on the basis of the couple's view of PND as a shared experience, or to provide emotional and decisional support for the women. The most common reason for partner non-attendance was work-related conflicts. At Time 2, distress was predicted by the degree to which women approached the PND decision jointly with their partners, and marital adjustment was predicted by women's satisfaction with

the support received from their partners. Marital adjustment at Time 3 was predicted by earlier levels of partner agreement about PND-related issues. The association between pre-counseling partner agreement and Time 3 well-being was mediated by women's use of relationship-focused coping (partner support seeking and empathic responding) and moderated by women's satisfaction with their partners' support. Joint decision-making at Time 1 was linked to Time 3 adjustment indirectly, through women's satisfaction with their partners' support. Finally, women's use of avoidant coping strategies mediated the association between perceived partner support and Time 3 adjustment outcomes. Results suggest that aspects of the couple relationship have the potential to facilitate or hinder women's experience of PND counseling and testing, thus highlighting the potential benefits of focusing at least a portion of the genetic counseling session on couple-related issues.

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ORGANIZATIONAL NOTE

This thesis begins with a general introduction, which presents a review of the relevant literature and outlines the goals for the two studies that follow. Article 1 and Article 2 present the results of these studies. They are formatted according to the guidelines stipulated by the specific journals to which they were submitted for publication. The first article was published in the August 2003 volume of *Psychology, Health & Medicine*. The second article has been submitted for publication in the *Journal of Applied Social Psychology* and is currently under review. A general discussion follows, summarizing the salient findings from the two studies. Appendices A and B include copies of the measures used in Study 1 and Study 2, respectively. Appendix C is a table of internal consistency values for the measures used in Study 2. Appendix D is a table of means and standard deviations for the three adjustment measures used in Study 2.

INTRODUCTION

The number of Canadian women choosing to have children at or above the age of 35 has been steadily increasing in recent decades (Almey et al., 2000). This parallels an equally dramatic increase in utilization of prenatal diagnosis (PND) procedures such as genetic amniocentesis and chorionic villus sampling (CVS; Almey et al., 2000; MacKay & Fraser, 1993). Advanced maternal age (AMA) remains the most common indication for prenatal testing, accounting for approximately 78% of all PND procedures (Cheschair & Hansen, 1999). Other clinical indications for prenatal genetic testing include the presence of a genetic abnormality in a family member or previous pregnancy, and a positive maternal serum screen result, indicating an increased risk of genetic abnormality in the current pregnancy (Cheschair & Hansen, 1999).

In the majority of cases, the results of prenatal genetic testing are normal and provide reassurance to expectant parents that there are no detectable fetal abnormalities (Caron, Tihy, & Dallaire, 1999). Prenatal testing thus has the potential to alleviate anxiety or serious doubts regarding the health of the fetus. Other benefits of PND include the opportunity to prepare for the birth of a child with a detected chromosomal abnormality, or to terminate a pregnancy following a positive PND test result.

Balanced against these advantages are a number of potential costs to PND testing that must be considered by expectant parents before deciding on the best course of action. For instance, even after a normal test result, some risk of having a child with a congenital abnormality still remains (Lemyre, Infante-Rivard, & Dallaire, 1999). PND procedures also introduce the added risk of fetal injury or miscarriage that accompanies such procedures. The risk of pregnancy loss resulting from amniocentesis is approximately 1 in 200 and the

risk from CVS is closer to 1 in 100 (Verp, 1992). Fears regarding procedural complications and worry about the possibility of abnormal test results can often accompany the decision to undergo PND testing (Cederholm, Axelsson, & Sjöden, 1999; Chervin, Farnsworth, Freedman, Duncan, & Shapiro, 1977; Evers-Kiebooms, Swerts, & Van den Berghe, 1988; Sjögren & Uddenberg, 1989).

The Experience of PND Testing

Several studies have assessed women's levels of psychological distress at various times throughout the genetic counseling and testing experience (Chervin et al., 1977; Dixson et al., 1981; Evers-Kiebooms et al., 1988; Fava et al., 1982, 1983; Phipps & Zinn, 1986; Spencer & Cox, 1987; Tercyak, Johnson, Roberts, & Cruz, 2001). It is difficult to interpret the absolute levels of distress reported in these studies, as a variety of different measures have been employed, and standardized scores are rarely provided to allow for normative comparisons. Michelacci et al. (1984) used the Symptom Questionnaire (Kellner, 1987) to assess levels of anxiety, depression, somatic symptoms, and hostility in women undergoing amniocentesis. Although the focus of their study was on changes in distress over different time points and they did not statistically compare mean scores at each time with scores from a normative sample, a visual inspection of the means would suggest that participants were experiencing elevated levels of distress. For example, prior to amniocentesis the women reported symptoms of anxiety that were 1.5 standard deviations higher than the mean reported in Kellner's (1987) general population sample. During the waiting period for test results, the difference was approximately one standard deviation, and after the receipt of normal test results the mean had reduced to 0.5 standard deviations higher than the mean reported by Kellner (1987).

Tercyak and colleagues (2001) administered the state anxiety scale of the Spielberger State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1979) to 129 women referred to a prenatal genetic counseling and testing service, the majority (78%) of whom had been referred solely for AMA. The authors statistically compared participants' STAI scores with previously published norms for this measure and found that baseline and post-genetic counseling anxiety were significantly greater in their sample than in the norms for both pregnant and non-pregnant adult women (Tercyak et al., 2001). In a study by Cederholm and associates (1999), 94 women scheduled for PND due to AMA (75%) or other indications completed the Hospital Anxiety and Depression scale (HAD; Zigmond & Snaith, 1983) and the Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) while waiting for an ultrasound prior to PND testing. Using established cutoff scores for evaluating clinical "caseness," the authors reported that 19% of the women would be classified either as "doubtful cases" or as "cases" on the anxiety scale of the HAD, and the corresponding proportion of cases on the depression scale was 12%. On the IES, the mean score was quite low; however, 36 women (39%) expressed medium or high levels of intrusion or avoidance symptoms with respect to worries about fetal injury, miscarriage, or abnormal test results following their PND procedure. This suggests that whereas the overall picture indicates non-clinical levels of anxiety, depression, and preoccupation in women undergoing PND, a substantial minority of women may be more vulnerable to experiencing elevated levels of distress in this situation.

Phipps and Zinn (1986) administered the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1971) to 40 women undergoing amniocentesis due to AMA and to a comparison group of 32 non-PND pregnant women. The two groups displayed similar levels

of anxiety at Time 1 (prior to amniocentesis for the AMA group) and at Time 3 (after AMA women received their test results), but the AMA group reported significantly more anxiety symptoms than the comparison group at Time 2 (in the waiting period for test results). This suggests that distress in AMA women is comparable to that reported by pregnant women in general, with the exception of elevated symptoms during the waiting period. This is consistent with a number of other studies that have indicated a significant increase in distress – particularly anxiety symptoms - during the waiting period for test results (Chervin et al., 1977; Dixson et al., 1981; Evers-Kiebooms et al., 1988; Spencer & Cox, 1987). This distress tends to be time-limited, subsiding to pre-genetic counselling levels once normal test results are known (Fava et al., 1982, 1983; Tercyak et al., 2001). In general, therefore, research does not appear to indicate large-scale psychological distress among women who choose to have prenatal genetic testing, although considerable variability in scores on measures of distress has been noted (Cederholm et al., 1999; Evers-Kiebooms et al., 1988).

The fact that women undergoing PND do not, on average, report clinically elevated levels of distress would suggest that prenatal genetic testing is not a highly stressful life event. It is, however, a unique time of transition experienced by increasing numbers of pregnant women over the age of 35. Transitional experiences such as childbirth, marriage, moving homes, or changing jobs, are typically included as "stressors" on life event checklists designed to evaluate overall levels of stress (Miller, 1996; Turner & Wheaton, 1997). One of the definitive features of the PND transition is the decision-making context. Couples who conceive at an advanced maternal age are immediately faced with deciding whether or not to attend a genetic counseling session to learn about genetic testing options. If they choose to attend, they will receive a large quantity of information about risks,

benefits, probabilities, error rates, and other relevant details to be considered in the decision about whether or not to have testing. They must also decide which, if any, procedure they would prefer: CVS, which holds the advantage of occurring earlier in pregnancy but carries an increased risk of fetal injury, or amniocentesis, which does not occur until well into the second trimester, but which infers a lower risk to the fetus. Subsequent decisions about whether or not to terminate a pregnancy in the event of a positive test result will be directly faced by only a small proportion of AMA women and their spouses; however, many couples will presumably address such a scenario at a hypothetical level prior to reaching a final decision about undergoing PND.

The potential for women to experience aspects of this decision-making process as stressful was illustrated in a qualitative study by Gregg (1993), in which women discussed their experiences facing a variety of pregnancy-related decisions. When women made choices about prenatal genetic testing and other procreative technologies, they reported experiencing subtle and overt pressures from a variety of sources, including family members, health providers, co-workers, friends, and strangers. The women in the study viewed their prenatal choices as a "double-edged sword:" although they welcomed the freedom to make prenatal choices, they found these choices to be accompanied by social and internal pressures to make the "right" decision, along with feelings of guilt and ambivalence (Gregg, 1993). It would be of great interest and benefit to identify some of the factors that may be more or less helpful to women in navigating the experience of prenatal genetic counseling and testing. To date, this empirical question remains largely unexamined in the literature.

In recent years there has been increasing recognition of the importance of considering the social context of stress, coping, and coping outcomes (O'Brien & DeLongis, 1997). A

growing body of research suggests that interpersonal stressors (i.e., stressors that directly involve and affect more than one member of a family or social network) can have a particularly deleterious impact on psychological well-being and mood (Bolger, DeLongis, Kessler, & Schilling, 1989; O'Brien & DeLongis, 1997; Pagel, Erdly, & Becker, 1987; Schuster, Kessler, & Aseltine, 1990). Some authors have theorized that mood may be more strongly affected by interpersonal than other types of stressors by virtue of the fact that the very people who could positively influence our coping and adjustment may, under such circumstances, represent a source of stress in themselves and may thus be perceived as insufficient providers of support (Bolger et al., 1989; Gottlieb & Wagner, 1991). Given that decisions about prenatal genetic testing are typically faced by couples rather than by individuals, and that the outcomes of those decisions usually affect both prospective parents, it would seem appropriate to focus on the couple relationship as a context for identifying potential correlates of women's adjustment to PND. This is particularly relevant in view of the fact that Grossman, Eichler, and Winckoff (1980) identified the marital dimension as one of the two strongest predictors of women's psychological adaptation during pregnancy. Two studies were undertaken to explore how aspects of the couple relationship might relate to women's experience of prenatal genetic testing for advanced maternal age.

The Role of the Partner at Genetic Counseling

The main objective of the first study was to investigate the role of the partner at the prenatal genetic counseling appointment. Research has shown that despite the tendency of most genetic centers to encourage both expectant parents to attend the genetic counseling session, rates of partner non-attendance can be surprisingly high, ranging from 20% to 44% (Browner & Preloran, 1999; Kenen, Smith, Watkins, & Zuber-Pittore, 2000; Sorenson &

Wertz, 1986). This raises questions regarding the role played by the partner at these appointments and the possible reasons for their attendance or non-attendance. Only two studies had begun to address these questions before now, both of which reported that work conflicts were the most common reason for partner non-attendance at prenatal genetic counseling (Browner & Preloran, 1999; Kenen et al., 2000). In addition, there is some evidence that women who attend the session alone may have a greater desire for personal control over the ultimate PND decision than women who are accompanied by their partners (Browner & Preloran, 1999). This would suggest that couples who view the PND decision-making process as a shared responsibility may be more likely to exhibit equal involvement in all aspects of the experience, including joint attendance at genetic counseling and, if genetic testing is chosen, joint attendance at the actual procedure as well. Research has yet to directly assess the potential motivation behind couples' decisions to attend such appointments together.

Based on qualitative analysis of case studies, Browner and Preloran (1999) reported that the women in their sample viewed their partners as providing support in the decision-making process. The men present at the genetic counseling session appeared to help in "containing" their wives' fears and assisting them in sorting through the large quantity of risk-related information presented to them. These findings led to the following hypotheses, which were empirically tested in the first study conducted here. First, it was expected that women who were accompanied by their partners to their genetic counseling appointments would experience greater reductions in anxiety and decisional conflict from pre- to post-counseling. Second, it was anticipated that accompanied women would report significantly lower levels of post-genetic counseling decisional conflict and state anxiety, and

significantly greater overall satisfaction with the counseling intervention, than would unaccompanied women.

The Contribution of Aspects of the Couple Relationship to PND Adjustment Outcomes

The second study sought to further elucidate the role of the partner in genetic counseling and testing and to explore the relative importance of various "relationship variables" in contributing to women's individual and marital adjustment after PND. The following variables were considered to be of interest and of potential relevance to the adjustment of AMA women.

Joint Decision-Making and Partner Agreement

The concepts of joint decision-making and partner agreement are both interpersonal variables with specific relevance to couple decision-making. For the purposes of the present research, joint decision-making is defined as the degree to which responsibility for deciding about PND testing is shared equally by both partners. Partner agreement refers to the degree to which couples share similar desires or intentions with regard to PND, both in terms of whether or not they would choose to have testing and how they would approach the news of a detected fetal abnormality. Although not synonymous, both spousal agreement and joint decision-making could be said to denote a sense of unity, or togetherness, in the couple decision-making process. As such, they are conceptualized here as two components of an overall construct entitled "partner unity." It is possible that in cases where couples disagree about which course of action to take there might be a less balanced approach to decision-making; one partner might ultimately reach the decision autonomously, particularly if polarized views persist even after one partner attempts to elicit the other's agreement. In contrast, partners who share similar views about prenatal testing might be more inclined to

view the final decision as a joint one. Scenarios such as these were noted to occur in the Vienna Diary Study, which examined the process of everyday decision-making in cohabitating couples with one or more dependent children (Kirchler, Rodler, Hölzl, & Meier, 2001).

Although research suggests that the majority of PND decisions are reached jointly by both partners (Cederholm et al., 1999; Dixson et al., 1981) and that couples show fairly high levels of agreement with each other about the best course of action to take (Beeson & Golbus, 1985; Kolker & Burke, 1994; Sorenson & Wertz, 1986), there is still sufficient variability within both of these dimensions to suggest that the PND decision-making process is not always a completely unifying experience for couples. Browner and Preloran (1999) found that only 23% of their sample of Mexican-American women described the testing decision as a joint one, and other studies have shown that a substantial minority of women (from one quarter to one third) reaches the decision on their own (Cederholm et al., 1999; Dixson et al., 1981). Moreover, at least some level of disagreement between spouses is not uncommon and can be manifested in differing views about abortion following a positive test result (Kolker & Burke, 1994; Pauker & Pauker, 1987), the risk of having an affected child (Sorenson & Wertz, 1986), the seriousness of potential problems associated with raising an affected child (Sorenson & Wertz, 1986), and whether or not to have genetic testing at all (Beeson & Golbus, 1985; Kolker & Burke, 1994; Rapp, 1991). It appears that couples are not always in agreement with respect to these important issues, nor do they always share equal responsibility for the corresponding decisions.

At this time, the psychosocial implications of partner agreement and joint decision- making remain largely unexamined in the empirical literature, although there

is a considerable theoretical basis for viewing both constructs as holding a positive link to marital adjustment. Two fundamental dimensions of close relationships that have frequently been posited in the literature are harmony and power (see Kirchler et al., 2001, for a review). These dimensions have been operationalized in various ways depending on the particular theoretical framework. Balance models of close relationships (e.g., Heider, 1958; Newcomb, 1971) have tended to view relationships as harmonious if the two people have developed consistent attitudes toward "relevant attitudinal stimuli" (Kirchler et al., 2001). This implies that the couple generally agrees about issues of significance to them. Such a framework is supported by the fact that measures of marital adjustment (e.g., the Dyadic Adjustment Scale; Spanier, 1976) often include a dimension pertaining to the couple's tendency to agree on a variety of relevant issues. The notion of "power" in close relationships refers to the relative influence of each partner in contributing to specific decisions. In harmonious relationships, partners often report having egalitarian power relationships – that is, they share equal influence in reaching decisions (Kirchler et al., 2001). This suggests that joint decision-making could also hold positive implications for marital adjustment.

Within the framework of prevention theory (Cole et al., 1993), marital researchers have begun to highlight the importance of identifying positive or protective factors that may contribute to marital adjustment. One of the principal domains of positive relationship behaviour investigated in recent years is the construct of "teamwork," thought to be important in maintaining and enhancing relationships, particularly during periods of transition or crisis (Belsky & Kelly, 1994; Cowan & Cowan, 1992; Cowan et al., 1985). The concept of teamwork appears to parallel the

"partner unity" construct explored in the second study. Indeed, Cordova's definition of teamwork (as cited in Flanagan et al., 2002) includes the following four dimensions, which encompass aspects of both joint decision-making and couple agreement: accomplishing tasks in a coordinated way; agreeing on tasks, goals, and priorities; feeling supported by the partner; and having confidence in the partner's contribution to couple-level goals. Cordova (as cited in Flanagan et al., 2002) found that high initial levels of teamwork were associated with healthier marital functioning in the transition to parenthood, and a lack of teamwork was the best predictor of depression, especially for wives. Similarly, Belsky and Kelly (1994) noted that couples' ability to put aside individual goals in the interest of a shared, "team" approach was essential for a successful transition to parenthood. It has been suggested that the notion of "teamwork" (or, it could be argued, "partner unity") should be further researched and included in models of functioning in romantic relationships (Flanagan et al., 2002).

The specific construct of couple agreement has received some empirical attention as a predictor of adjustment in pregnancy, though not in PND in particular. Snowden, Schott, Awalt, and Gillis-Knox (1988) reported a significant positive correlation between couple agreement about becoming pregnant and subsequent marital adjustment both early and late in pregnancy. Séguin, Potvin, St-Denis, and Loiselle (1999) found that among non-AMA pregnant women, frequent conflictual episodes with significant others in the early postnatal period predicted depressive symptoms at nine weeks post-partum. However, the single-item measure of "number of conflictual episodes" was quite vague and is not necessarily equivalent to couple disagreement about a particular pregnancy-related issue. With respect to joint decision-making, there

is some evidence that a state of equity among couples in approaching a variety of non-PND decisions is related to greater marital satisfaction (Houlihan, Jackson, & Rogers, 1990; Peterson, 1981; Kirchler & Wagner, 1987; Walster, Walster, & Traupmann, 1978).

Although these issues have yet to be empirically investigated in a PND population, there is some evidence, albeit anecdotal, to suggest that spousal disagreement can be a distressing experience. In a series of case studies applying decision analysis with couples considering amniocentesis, Pauker and Pauker (1987) described scenarios in which spouses disagreed with each other to varying degrees about testing and about their views on aborting an affected fetus. The authors observed that some women became "acutely distressed at the difference between their partner's values and their own" (Pauker & Pauker, 1987). They did not directly measure women's levels of distress, however. Similarly, during the course of a pilot study of women referred for AMA counseling at the Children's Hospital of Eastern Ontario (CHEO) genetics clinic, issues of spousal conflict were raised by a woman who reported clinically elevated scores on standardized measures of anxiety and depressive symptoms (Humphreys, Cappelli, Allanson, & Aronovitch, 2002). Without being asked the specific reasons for her distress, this participant volunteered that she and her partner held strongly opposing views about genetic testing and abortion. She reported feeling "stuck" and isolated in the decision-making experience. A more systematic exploration of how couple agreement and joint decision-making might relate to both individual and dyadic adjustment in the AMA population warrants attention at this time.

Perceptions of Partner Support

Although research has yet to examine the role of social support in the context of the PND experience, several studies have examined the significance of social support during pregnancy in general, finding strong evidence that it corresponds with lower distress symptoms (Alexander, Feeney, Hohaus, & Noller, 2001; Bernazzani, Saucier, David, & Borgeat, 1997; Demyttenaere, Lenaerts, Nijs, & Van Assche, 1995; Séguin, Potvin, St-Denis, & Loiselle, 1995; Séguin et al., 1999; Tietjen & Bradley, 1985) and higher levels of both emotional well-being (Alexander et al., 2001; Thorpe, Dragonas, & Golding, 1992) and marital adjustment (Tietjen & Bradley, 1985). Only a few of these studies assessed partner support specifically (Alexander et al., 2001; Demyttenaere et al., 1995; Tietjen & Bradley, 1985). Research in various populations has shown that relationship-specific support (e.g., spousal support) adds to the prediction of psychological adjustment after accounting for the contribution made by global support (Lieberman, 1982; Sarason, Sarason, & Pierce, 1994), and that support from other sources cannot compensate for a lack of spousal support in preventing negative stress outcomes (Coyne & Anderson, 1999; Coyne & DeLongis, 1986; Tietjen & Bradley, 1985). This is likely to be especially true during the transition to parenthood, when both men and women have reported relying on their partners for approximately 80% of their total social support (Brown, 1986). It is also important to focus on women's *perceptions* of the adequacy of support from their partners, as such subjective appraisals have been shown to be more persistently and strongly associated with adjustment outcomes than are objective measures of the amount of support received (Aaronson, 1989; Sarason et al., 1994; Turner, 1999; Wethington & Kessler, 1986; Zimet, Dahlem, Zimet, & Farley, 1988).

Relationship-Focused Coping

The concept of relationship-focused coping constitutes a relatively recent addition to the empirical literature on stress and coping (Coyne & Smith, 1991; DeLongis & O'Brien, 1990; O'Brien & DeLongis, 1997), and it refers to coping efforts geared toward managing and maintaining relationships during stressful periods (O'Brien & DeLongis, 1997). The traditional approach to studying coping mechanisms has been highly individualistic, with minimal consideration of the social context; as such, important aspects of the process of adaptation to stress have likely been overlooked, especially for situations that carry strong personal significance for couples. Indeed, it has been suggested that stress occurring in the context of parental and marital roles is best handled by coping strategies in which the individual remains committed to and engaged with the relevant significant others (Pearlin & Schooler, 1978). It has also been posited that in the context of couple decision-making, the goal of partners may not simply be to make the best possible choice among a set of alternatives; promoting or sustaining the quality of the relationship can often be the overriding objective, so that the wishes not only of the individual but also of the partner must be taken into account (Kirchler et al., 2001). It would thus seem appropriate to explore relationship-focused coping in the context of PND decision-making.

One of the primary relationship-focused coping strategies described in the literature is empathic responding, introduced and defined by DeLongis and O'Brien (1990) as an individual's attempts to accurately perceive the affective world of others involved in a stressful situation and to communicate accurately and sensitively one's understanding of those persons. The occurrence of empathic responding is reported to be more likely in situations where a friend or loved one is directly involved (O'Brien & DeLongis, 1997) and

where greater personal significance is attached to the situation (O'Brien, 2001). It may thus be particularly relevant to the PND context. An additional coping strategy that involves a focus on intimate relationships but that is not explicitly included in existing formulations of relationship-focused coping is the seeking of support from one's partner. Although general support seeking is included as a subscale in many coping inventories (e.g., Amirkhan, 1990; Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1985), systematic assessments of partner-specific support seeking have yet to be published. It might be argued that empathic responding and seeking support from one's partner reflect two sides of the same coin: the first involves generating supportive responses *toward* one's partner, and the latter involves attempts to elicit supportive responses *from* one's partner. Both share a focus on the intimate relationship in the process of navigating stressful situations or transitions.

At this time, little is known about the potential impact of such relationship-focused coping strategies on adjustment outcomes. In their study of stress and coping among stepfamilies, O'Brien, DeLongis, and Campbell (as cited in O'Brien & DeLongis, 1997) found that women who employed higher levels of empathic responding in managing difficulties with spouses, children, and stepchildren reported higher levels of marital satisfaction, lower marital tension, and reduced negative mood, even after controlling for prior levels of these outcomes. This suggests both individual and dyadic benefits to empathic responding. The extant outcome research on support seeking is similarly limited. Monnier, Stone, Hobfoll, and Johnson (1998) examined "prosocial" and "antisocial" coping strategies employed by men and women in the U.S. Postal Service. The construct of "prosocial" coping, as operationalized in their study, appeared to encompass aspects of social support seeking and general social interaction. The authors found a negative

association between prosocial coping and psychological distress. The ability to generalize these findings to couples receiving prenatal genetic testing is questionable. In a sample of parents of children with cancer, Hoekstra-Weebers, Jaspers, Kamps, and Klip (1999) found that mothers who sought less support at the time of diagnosis were at significantly higher risk for psychological distress a year later, though this effect was not observed among fathers. There appears to be no published research to date that has specifically explored the adjustment implications of seeking support from one's relationship partner.

Exploring Mediational Models

In addition to exploring the direct association between relationship variables and adjustment outcomes, the second study sought to identify potential mechanisms through which the relationship context might contribute to women's adjustment to prenatal testing. Two variables were hypothesized to mediate the relation between partner "unity" (agreement and joint decision-making) and subsequent adjustment: perceived partner support and relationship-focused coping. Although this marks the first examination of such mediational models, some support for the constituent effects can be found in the literature and in the qualitative content of discussions held with the abovementioned AMA client at the CHEO genetics clinic (Humphreys et al., 2002). The sense of isolation reported by this woman in the face of marked disagreement with her spouse suggests that when couples hold differing viewpoints they may have greater difficulty supporting each other and may, in turn, feel unsupported by each other. This is further suggested by the finding of Pearlin and McCall (1991) that couple disagreement about a particular decision can inhibit both support seeking and the expression of support. It should be noted that the types of decisions examined by Pearlin and McCall (1991) primarily related to one spouse accepting a new job, and thus the

applicability of the results to a PND setting is limited. Similarly, Kirchler and Wagner (1987) found that couple agreement on purchase decisions correlated significantly and positively with a sense of support from one's partner – and, ultimately, with individual and marital well-being. Again, it cannot be assumed that findings from the context of purchase decisions are generalizable to the experience of prenatal genetic testing decisions. A direct analysis within the latter context is required.

There is also some research to suggest that joint decision-making may be related to perceptions of partner support. Van Willigen and Drentea (2001) found that high levels of perceived social support resulted when partners contributed equally to household decisions. Within a PND context, Dixson et al. (1981) provided qualitative data to the effect that in cases where husbands believed the final choice about prenatal testing should be left with their wives, some women felt a lack of support and the burden of responsibility for the test decision.

The majority of previous studies have implicitly treated social support as a stable coping resource stemming from relatively fixed personal or environmental characteristics; as such, it has been viewed as being independent of the nature or intensity of the stress confronted by the individual (Eckenrode & Wethington, 1990; Lepore, Evans, & Schneider, 1991). This independence perspective is an essential part of empirical investigations into the role of social support as a moderator of stress outcomes (Aaronson, 1989; Cohen & Willis, 1985; Lepore, 1997; Séguin et al., 1995; Wheaton, 1985). Only recently have researchers begun to explore how perceptions of social support might correlate with aspects of the stressor itself, thus viewing support as an endogenous variable that could mediate the effects of stress on subsequent adjustment. Perceived support has been found to serve a mediating

role in the prediction of psychological adaptation from such interpersonal stressors as chronic parenting stress (Quittner, Glueckauf, & Jackson, 1990) and social crowding (Evans, Palsane, Lepore, & Martin, 1989; Lepore et al., 1991; Lepore, 1997), as well as more global stressors such as natural disasters (Kaniasty & Norris, 1993).

The potential application of this perspective to women's adjustment following PND was deemed worthy of exploration in the second study, especially in light of the theory that significant others who are directly affected by a particular stressor may at times contribute to one another's difficulties in adapting to the situation (Bolger et al., 1989) and may be less able to provide support to one another (O'Brien & DeLongis, 1997). Prenatal genetic testing is an experience involving high personal stakes for both partners; therefore, it cannot automatically be assumed that support from the partner will be a constant resource upon which AMA women can draw throughout the genetic counseling and testing process.

Turning to the potential mediating role of relationship-focused coping, it should be noted that coping behaviour in general has frequently been treated as a mediator in the empirical literature on adaptation to stress or to significant life transitions. For example, certain approaches to coping, such as emotion-focused or avoidant coping, have been shown to mediate the association between personality traits (e.g., neuroticism, locus of control) and psychological adjustment outcomes (Amirkhan, 1998; Atkinson & Violato, 1994; Band et al., 1998; Boland & Cappeliez, 1997; Bolger, 1990; Endler & Parker, 1990; McCrae & Costa, 1986). If individual coping strategies can be said to mediate the association between personality characteristics and subsequent adjustment, then it would seem feasible to hypothesize that relationship-focused coping could mediate the association between interpersonal factors and adjustment outcomes. Indeed, it has been shown that stress

occurring in close personal relationships tends to correlate more strongly with relationship-focused coping than with other, more individual coping strategies (O'Brien & DeLongis, 1996). It might thus be anticipated that women who experience conflicting viewpoints with their partners about PND may be less inclined to turn to their partners for support, especially if there is a risk that their personal opinions would not be validated by their partners. They might also be less inclined to respond empathically toward their partners if they disagree and thus have difficulty identifying with their partners' point of view. Such a hypothesis is supported in part by qualitative evidence for the distressing nature of spousal disagreement about PND (Humphreys et al., 2002; Pauker & Pauker, 1987), as well as the finding of Pearlin and McCall (1991) that couple disagreement about a decision can inhibit support-seeking behaviour. Similarly, women who do not share the PND decision-making responsibility equally with their partners could experience prenatal genetic counseling and testing as a more individual process, as suggested by the finding in the first study that these women are more likely to attend the genetic counseling session alone (Humphreys, Cappelli, Hunter, Allanson, & Zimak, 2003). A less unified approach to the PND experience might thus be hypothesized to involve less emphasis on the couple relationship as a coping resource.

Not only was relationship-focused coping hypothesized to mediate the effects of interpersonal stressors (e.g., partner disagreement and imbalanced decision-making), but it was also hypothesized to mediate the effects of a more individual stressor, namely decisional conflict about PND testing. Decisional conflict (O'Connor, 1995) is defined as a state of uncertainty about the course of action to take and often occurs when choices involve risk or uncertainty of outcomes, high stakes in terms of potential gains and losses, and anticipated

regret over the positive aspects of the rejected option(s). There is some evidence to indicate a significant correlation between decisional uncertainty and measures of distress (Al-Hassan & Wierenga, 2000; Hunter et al., 2004; Kuhn, Myers, & Davis, 1988). That such an association could be mediated by relationship-focused coping is suggested by the results of the first study (Humphreys et al., 2003; see Article 1 for details).

The second study also involved the analysis of potential mechanisms through which partner support may contribute to women's adjustment following PND testing. Some investigators have posited that social support can function as "coping assistance," a resource upon which individuals can draw in order to cope more effectively with stress (Cobb, 1976; Lazarus & Folkman, 1984; Thoits, 1986). In the past decade or so, this concept has been empirically tested and validated with non-PND-related stressors. Among individuals diagnosed with cancer, studies have indicated that spousal support exerts an indirect effect on psychological adjustment through its association with coping strategies such as positive thinking and avoidance (Manne & Glassman, 2000; Manne, Pape, Taylor, & Dougherty, 1999). In a study of support and coping among minority women during pregnancy, Rudnicki, Graham, Habboushe, and Ross (2001) found perceived social support to be significantly and negatively correlated with avoidant coping, which in turn was positively associated with depressed mood. Similar findings have been reported in the context of coping with rheumatoid arthritis (Manne & Zautra, 1989) and family conflict in step-families (O'Brien, DeLongis, & Campbell, as cited in O'Brien & DeLongis, 1997).

In efforts to explain this indirect association between social support and adjustment, it has been suggested that spousal support may increase an individual's sense of agency and thus motivate more proactive, less avoidant ways of coping with stressful situations (O'Brien

& DeLongis, 1997). Support for this theory can be found in studies demonstrating that an individual's sense of coping self-efficacy mediates the association between perceived social support and mental health outcomes (Cutrona & Troutman, 1986; Major et al., 1990). It remains to be seen whether the above findings would generalize to the context of prenatal genetic testing. It was hypothesized that AMA women who reported greater satisfaction with the support provided by their partners would engage in more problem solving and less avoidant coping, which in turn would correlate with more positive adjustment following prenatal testing.

Overview of the Present Studies

In the first study reported herein, women referred to the CHEO genetics clinic for AMA counseling completed self-report measures assessing sociodemographic variables, aspects of the PND decision-making process, symptoms of anxiety and depression, and PND-related decisional conflict, both immediately before and after their genetic counseling session. Article 1 compared the women who attended their genetic counseling sessions alone with those who came accompanied by their partners on several of these dimensions, in an initial attempt to understand the role of the partner at the genetic counseling appointment. The results spawned a number of additional research questions, which were addressed in Article 2.

In the second study, a more recent sample of women referred to the CHEO genetics clinic due to AMA was recruited and followed prospectively across three time points during pregnancy. The goal of Article 2 was to further elucidate the role of the partner in genetic counseling and testing and to explore the relative importance of various "relationship variables" in contributing to women's individual and marital adjustment following PND.

The following five relationship variables were examined in relation to adjustment outcomes: (a) women's reported levels of agreement with their partners about various PND-related issues, including whether or not to have testing; (b) the degree to which women viewed PND as a joint decision to be shared with their partners; (c) women's perceptions of the support received from their partners; (d) the extent to which women sought support from their partners to cope with the PND experience; and (e) women's use of empathic responses toward their partners as a mode of coping with the PND experience.

Finally, having investigated the direct links between these relationship variables and adjustment outcomes, preliminary mediational models were explored later in Article 2, in an attempt to better understand the interplay between various individual and interpersonal factors as they pertain to women's psychological and marital adjustment following testing. The implications of the findings from these studies are discussed within each article and in the general discussion that follows.

What is the Significance of Attendance by the Partner at Genetic Counseling for Advanced Maternal Age?

Abstract

The use of prenatal genetic counseling and testing for advanced maternal age (AMA) has increased dramatically in recent years. In many centers, women are encouraged to bring their partners to their genetic counseling appointments; however, a significant minority of partners does not attend. The purpose of the present study was to conduct a preliminary investigation into the role of partners through a comparison of women who attend with and without their partners. Participants were 345 women referred to a genetics clinic for AMA genetic counseling, of whom 222 (64%) attended with their partners and 123 attended alone. All participants completed a series of self-report measures both prior to and immediately after the counseling session. Contrary to hypotheses, women accompanied by their partners did not report greater psychosocial adjustment following genetic counseling. There were, however, some significant pre-counseling findings: women who were accompanied by their partners reported somewhat higher levels of state anxiety and decisional conflict before the session than did those who attended alone. Results suggest that a subgroup of women who experience greater indecision and anxiety surrounding prenatal diagnosis may have a greater need for support from their partners in reaching a decision. Partner attendance may thus reflect a coping strategy employed by these women to facilitate their decision-making process. An alternate explanation is that the presence of the partner might contribute to increased anxiety and indecision among women.

What is the Significance of Attendance by the Partner at Genetic Counseling for Advanced Maternal Age?

In recent decades the Canadian health care system has seen a steady rise in the use of prenatal diagnostic (PND) services such as genetic amniocentesis and chorionic villus sampling (Almey et al., 2000; MacKay & Fraser, 1993). Whereas advanced maternal age (AMA) remains the most common indication for prenatal testing in North America (Cheschair & Hansen, 199), some countries such as the UK now use serum markers and/or early ultrasound as the leading precursor for prenatal genetic testing (Lowther & Whittle, 1997; Wald, Huttly, & Hennessy, 1999). In the majority of cases, the results of PND testing are normal and provide reassurance to expectant parents that there are no detectable fetal abnormalities (Caron et al., 1999). Prenatal testing has the potential to alleviate anxiety or serious doubts regarding the health of the fetus. Other benefits of PND include the opportunity to prepare for the birth of a child with a detected abnormality, or to terminate a pregnancy following a positive PND test result.

Contrasting these advantages are a number of potential costs that should be considered by expectant parents who are considering PND testing. These include the risk that remains after a normal test result of having a child with a congenital abnormality (Lemyre, Infante-Rivard, & Dallaire, 1999), and the added risk of miscarriage or fetal injury associated with the procedures (Verp, 1992). Furthermore, there may be psychological repercussions from the PND testing experience. Fears about procedural complications and worry about the possibility of abnormal test results may affect the decision to undergo PND testing (Cederholm et al., 1999; Chervin et al., 1977;

Evers-Kiebooms, Swerts, & Van den Berghe, 1988; Sjögren & Uddenberg, 1989). The PND decision-making process is thus a complex one in which couples must grapple with multiple, often conflicting issues. Expectant parents must weigh the costs and benefits of prenatal testing and their decision will reflect their unique values, concerns, and beliefs, both as individuals and as a couple.

The complexity and importance of this decision, and its potential impact on both prospective parents, leads most genetic centers to encourage both partners to attend the genetic counseling session. Notwithstanding this invitation to their partners, a substantial minority of women comes to genetic counseling alone. Partner attendance rates that have been cited in the literature range from 56% (Browner & Preloran, 1999) to 80% (Kenen et al., 2000). This raises questions as to the significance of involvement by partners in genetic counseling and the reasons behind their attendance or non-attendance. These include the role partners play in the decision-making process, whether they act as a source of social support, whether they facilitate decision-making by women through helping to process the information presented during genetic counseling, what factors are associated with their participation in genetic counseling, and how their attendance affects the decision reached by the couple.

To date there is a paucity of research that addresses these questions. Browner and Preloran (1999) conducted a preliminary study of the role of male partners in the amniocentesis decisions of Mexican-American women. The most common reason given by male partners for not attending the genetic counseling appointment was difficulty in getting time off work or being out of town due to work responsibilities. In some cases, women discouraged their partners from attending because this gave them a greater sense

of control over the decision (Browner & Preloran, 1999). Kenen et al. (2000) also found work conflicts to be the most common reason for non-attendance of partners at prenatal genetic counseling. Whether or not other underlying factors contribute to the decision by men not to attend the genetic counseling session remains to be seen.

In exploring potential correlates of amniocentesis uptake, Browner and Preloran (1999) found that presence of the male partner at the genetic counseling session was the only consistent statistically significant variable. Women whose partners attended the appointment were more likely to undergo amniocentesis than were those who came alone. In contrast, Kenen and colleagues (2000) did not find a significant association between the uptake of PND testing and presence of the partner at genetic counseling, but the study was limited by a very small sample size, and its predominantly qualitative methodology.

No study has systematically examined the differences between women who attend prenatal genetic counseling alone and those who are accompanied by their partners. The purpose of the present study was to offer a preliminary exploration of the role played by the partner at the genetic counseling appointment. As there is very little extant research on this issue, the analyses were mainly exploratory in nature. Nevertheless, the notion of partners as facilitators in the decision-making process (Browner & Preloran, 1999) led to the prediction that women who were accompanied by their partners to the genetic counseling appointment would experience greater reductions in anxiety and decisional conflict from pre- to post-counseling. It was further hypothesized that accompanied women would report significantly lower levels of post-

genetic counseling decisional conflict and state anxiety, and significantly greater overall satisfaction with the counseling intervention, than would unaccompanied women.

Methods

The current study formed part of a larger randomized trial designed to compare three alternative approaches to AMA genetic counseling: one-on-one counseling, group counseling, and the use of an audio tape-booklet decision aid. The randomized trial was carried out at the Children's Hospital of Eastern Ontario (CHEO) genetics clinic. Results of the larger study have been presented at an international conference and submitted for publication (Hunter et al., 2004).

Participants

Participants were 345 women referred to the CHEO genetics clinic by their primary physicians between July 2000 and June 2001. Only women whose clinical indication for PND was maternal age over 35 (AMA) were included in the study, as this is the most common reason for referral, and we wanted a relatively homogeneous sample.

Inclusion criteria: (a) age $\geq$ 35 years at time of delivery; (b) gestational age $\leq$ 18 weeks; (c) fluency in English; (d) no significant family history of a genetic disorder as indicated by the referring physician; and (e) first time having PND counseling. Any woman having a multiple pregnancy of three or more was excluded from the study.

The women were allocated randomly to the three counseling interventions and participated as follows: 126 received one-one-one genetic counseling, 106 received genetic counseling in a group with two or three other women/couples, and 113 were given an audio tape-booklet decision aid. The last group had the option of speaking with a genetic counselor afterwards if they had any questions. The nature of the information provided was

equivalent across the three interventions. Women also completed a standard family history questionnaire that was reviewed by a counselor in order to deal with any specific concerns raised by the family history. Of the total sample of women, 222 (64%) attended their genetic counseling session with their partners, and the remaining 123 attended the session alone. Those accompanied by their partners were evenly distributed across the three counseling interventions. All participants resided within the Ottawa-Carleton regional area of approximately one million.

Measures

The Prenatal Diagnosis Survey (PDS): The PDS is a 38-item self-report questionnaire designed for the PND trial to assess risk perception, health behaviors, and attitudes toward prenatal diagnostic testing. The survey also assesses sociodemographic variables, concerns and expectations regarding PND testing, and the degree to which participants expect to make their decision about testing individually or jointly with their partners. The PDS was based upon surveys extensively used by our research group to assess constructs related to the Health Belief Model (Rosenstock, 1974) in other medical genetic areas including Cystic Fibrosis carrier screening (Virley-O'Connor & Cappelli, 1999) and breast cancer gene testing (Cappelli et al., 1999). Slightly different versions of the PDS were designed for the pre- and post-counseling assessments.

State and Trait Anxiety Inventory (STAI): The STAI is a widely used self-report instrument designed to assess levels of anxiety (Spielberger, Gorsuch, & Lushene, 1970). It consists of 20 items to which respondents indicate how they are feeling now (state subscale) and an additional 20 items eliciting how they usually/generally feel (trait subscale). The

STAI has demonstrated good internal consistency and has been extensively validated for content, criterion, and construct validity (Spielberger et al., 1970).

Center for Epidemiologic Studies – Depression Scale (CES-D): The CES-D (Radloff, 1977) is a 20-item self-report measure of depressive symptoms requiring individuals to indicate the extent to which they have felt or behaved in certain ways over the course of the past week. Scores at or above the cutoff of 16 are deemed to be indicative of clinical levels of depressive symptomatology (Radloff, 1977). The CES-D has been extensively used with community samples and has been shown to be both reliable and valid (Radloff, 1977).

Knowledge Questionnaire: The Knowledge Questionnaire (KQ) is a 19-item self-report measure designed to examine participants' knowledge of prenatal testing and testing alternatives. Higher scores reflect greater knowledge about PND testing options. Items on the survey were modified from the Maternal Serum Screening Knowledge Questionnaire (MSSKQ; Goel et al., 1996), which has demonstrated adequate internal consistency (Cronbach's $\alpha = .74$) and test-retest reliability ($r = .76$; Goel et al., 1996). Mean MSSKQ scores have been shown to increase with age, education, and family income, and among those reporting having an opportunity to discuss MSS and receiving written material about it (Goel et al., 1996). The original MSSKQ used a Likert-type response format, whereas the KQ uses a true-false format. The KQ was first used by Drake et al. (1999) in a study evaluating the utility of a PND-related decision aid for women of advanced maternal age. The authors did not provide information regarding the internal consistency of the measure; however, evidence for its validity was seen in the finding that for almost every item, the proportion of participants giving the correct answer increased by at least 20% after using the decision aid (Drake et al., 1999).

Decisional Conflict Scale (DCS): The DCS (O'Connor, 1995) is a 16-item self-report measure designed to assess levels of decisional conflict associated with a specified upcoming health decision. Decisional conflict is defined as a state of uncertainty about the course of action to take and often occurs when choices involve risk or uncertainty of outcomes, high stakes in terms of potential gains and losses, and anticipated regret over the positive aspects of the rejected option(s). For the current study, instructions specified that participants consider the items in the context of the decision about whether or not to undergo PND testing. Higher scores indicate greater decisional conflict. The DCS yields an overall score and scores on four subscales. The *Uncertainty* subscale (4 items) assesses the degree to which respondents are sure or clear about what to do in light of the particular health decision to be made. The *Information/Values* subscale (5 items) assesses the degree to which respondents experience a lack of sufficient information about options, risks, and benefits, along with uncertainty as to the perceived importance of these risks and benefits. The *Support* subscale (3 items) assesses the degree to which respondents experience a lack of social support or excessive social pressures associated with their decision. The *Perceived Effective Decision-making (PEDM)* subscale (4 items) assesses perceptions of the respondents that they are making an informed decision, that the decision is consistent with their personal values, that they anticipate implementing the decision, and that they are satisfied with their decision. The DCS has been found to discriminate significantly between patients who express certainty versus uncertainty regarding decisions to continue with medication treatment (Bunn & O'Connor, 1996) and decisions to decline or accept an influenza vaccine (O'Connor, 1995). Test-retest reliability is adequate over a two-week

period (r = .81; O'Connor, 1995), and alpha coefficients range from .78 to .92, indicating adequate internal consistency (O'Connor, 1995).

Intervention Satisfaction Questionnaire (ISQ): The 11-item short form of the Satisfaction with Genetic Counseling Scale (Shiloh, Avdor, & Goodman, 1990) was used to assess the satisfaction of participants with their counseling intervention. Shiloh et al. (1990) recommended using the short-form, as it correlated highly with the longer 32-item version (r = 0.90) and maintained good reliability. A benefit of the ISQ is its focus on satisfaction with genetic counseling specifically, as opposed to general satisfaction with any health care intervention. Items were chosen to cover three aspects of health care considered relevant to satisfaction: instrumental, affective, and procedural (Shiloh et al., 1990). Factor analyses supported this internal structure; moreover, each factor correlated highly with a general survey item assessing clients' overall feeling of satisfaction with the intervention (Shiloh et al., 1990). The overall ISQ has shown good internal consistency (Cronbach's α = .90; Shiloh et al., 1990).

Follow-Up Telephone Survey: The 7-item Follow-up Telephone Survey was designed for this study as a brief screen of the satisfaction of participants with the genetic counseling intervention and their confidence in the decision they made regarding PND. Responses are on a Likert-type scale ranging from 1 (strongly agree) to 5 (strongly disagree).

Procedure

The study was approved by the CHEO Research Ethics Committee. At the time of referral to the CHEO genetics clinic, initial intake data were obtained from patients; a research assistant (RA) reviewed the intake data and telephoned all women who met the inclusion criteria for the study. During the initial phone call, the RA explained the nature

and purpose of the study and obtained informed consent. Women who declined participation were offered the standard clinical care at CHEO, which consisted of a group genetic counseling session. Those who agreed to participate were randomized into one of the three counseling interventions and were asked to arrive at the clinic one hour prior to their scheduled appointment to complete a questionnaire package.

Upon arrival at the genetics clinic, participants completed the pre-counseling questionnaire package, consisting of: the PDS, the Knowledge Questionnaire, the STAI, the CES-D, the DCS, and two additional measures used for the randomized trial but not relevant to the current analysis of partner attendance. Participants then took part in the counseling intervention to which they were assigned (each of the three alternative interventions lasted for approximately one hour), after which they completed the post-counseling questionnaire package. This package consisted of the modified PDS and other measures administered prior to counseling, as well as the ISQ. The CES-D was added to the post-counseling assessment battery part-way through the trial and the number of participants who completed this measure both before and after counseling was too small for the current multivariate analyses. Therefore, only the pre-counseling CES-D scores are examined and discussed below. It should be noted that at the time participants completed the post-counseling questionnaires, they were not expected to have reached a final decision about prenatal testing; some genetic counseling recipients decide right away, whereas others take up to several days to think about it and reach a decision. Finally, after participants had reached 24 weeks' gestation they were telephoned by the RA and took part in the Follow-up Telephone Survey, which took less than five minutes to complete.

Results

Sample

Participants ranged in age from 34 to 44 years, with a mean of 37 years. Half of the sample had at least one child prior to the current pregnancy, 108 (35%) reported at least one previous spontaneous abortion and 78 (24%) reported at least one prior induced abortion. On average, participants had achieved a high level of education and were of high socioeconomic status (Table 1).

Preliminary Analyses

Before conducting multivariate analyses of the differences between women who brought their partners to the clinic and those who came alone, these two groups were assessed for equivalence on key demographic and clinical variables, using independent-samples t-tests for continuous variables and Chi-square tests for categorical variables. No differences between the two groups were found with respect to education level, religiosity, hours worked per week, language spoken at home, or parental status ($p>.05$). Moreover, women accompanied by their partners were no more or less likely than unaccompanied women to report a previous spontaneous or induced abortion ($p>.05$). Significant differences were found, however, in age and family income. Women who brought their partners to their appointments were significantly younger ($p<.01$) and reported a higher family income ($p<.001$) than unaccompanied women (Table 1). In order to control for the potential effects of these group differences on any further analyses, both age and income were included as covariates in subsequent multivariate analyses. All analyses were conducted across the entire sample, without controlling for the type of counseling intervention. This was deemed to be justified because almost identical proportions of

women within each intervention arm were accompanied by their partners (approximately 37% of those in one-on-one counseling, 30% of those in group counseling, and 33% of those who received the decision aid; χ^2 (2) = 0.245, p=.88).

Principal Analyses

A mixed repeated measures multivariate analysis of covariance (MANCOVA) was used to examine whether any changes on key dependent measures from pre- to post-genetic counseling varied as a function of attendance by the partner. The between-subjects factor was Partner Presence (present vs. absent), and two covariates (age and family income) were included. The repeated measures factor was Time (pre- vs. post-counseling), which comprised the following dependent variables measured at both time points: (a) state anxiety (from the STAI), (b) scores on each of the four decisional conflict subscales (from the DCS), (c) knowledge of PND (from the Knowledge Questionnaire), and (d) the degree to which women anticipated that the PND decision would be made jointly with their partner (one item from the PDS). Note that trait anxiety (from the STAI) was not included as it was viewed as a stable characteristic, unlikely to change over such a short time span.

Results are displayed in Table 2. The omnibus test revealed a significant main effect for Partner Presence (p<.001). After controlling for differences in age and family income, women who were accompanied by their partners reported higher levels of uncertainty about the PND decision (p<.01) and agreed more strongly that the decision would be made jointly with their partners (p<.001). These were the only differences between accompanied and unaccompanied women when data were collapsed across the two time points. The overall main effect for Time was also significant (p<.05). Scores on the Perceived Effective Decision-Making (PEDM) subscale of the DCS decreased significantly from pre- to post-

genetic counseling ($p<.05$), indicating that the sample as a whole shifted toward greater confidence and satisfaction in the decision-making process. This was the only dependent variable to change over time when data were collapsed across the two groups of women. The overall Time x Partner Presence interaction was not significant, although at the univariate level the corresponding interaction for scores on the Support subscale of the DCS was significant at $p=.05$. All other univariate interactions between Partner Presence and specific repeated measures variables were not significant ($p>.05$).

Aiken and West (1991) caution about interpreting null results of tests of interaction effects because the relative sensitivity of such tests to measurement error and reduced power can "lead to greater apparent empirical support for theoretical predictions of main effects at the cost of support for theoretical predictions of interactions" (p. 167). With that in mind, two additional analyses were conducted to isolate the effects of partner presence at each of the two time points, respectively. This allowed for further exploration of the interaction for the Support subscale of the DCS, along with a test of between-group differences on those variables for which complete data were available or used at only one of the time points (i.e., depressive symptoms and trait anxiety prior to genetic counseling and intervention satisfaction following genetic counseling). Two separate MANCOVA were computed with age and family income serving as covariates. Table 3 lists the dependent variables included in each analysis and the corresponding results.

For both analyses, the omnibus tests were significant ($p<.001$). Prior to genetic counseling, women who were accompanied by their partners reported higher levels of both state and trait anxiety ($p<.05$), greater uncertainty regarding what choice to make ($p<.01$), and a greater need for support from others in coming to a decision about PND ($p=.01$). They

also agreed more strongly than unaccompanied women that the decision about whether or not to have PND testing would be made jointly with their partners ($p<.001$). Whereas almost all (95%) of the accompanied women reported that they anticipated reaching a decision about PND jointly with their partners, this was true for only three quarters (75%) of unaccompanied women. There were no significant differences between the two groups with respect to depressive symptoms, knowledge about PND, or scores on either the Information/Values or PEDM subscales of the DCS ($p>.05$; Table 3). After genetic counseling, only two group differences were observed: women who were accompanied by their partners continued to report greater uncertainty about what choice to make ($p<.05$) and to view the PND decision as a more joint endeavor to be shared with their partners ($p<.001$). All other post-counseling differences between the two groups were non-significant ($p>.05$; Table 3).

To address whether accompanied women would be more likely to undergo PND testing, a logistic regression analysis was conducted. The dependent variable was partner presence (present vs. absent). Predictors were entered into the model in two blocks: the first block included the two covariates, age and income, and the second block included three categorical variables. These were (a) pre-counseling reports by women as to whether or not they planned to have PND testing (yes, no, or uncertain); (b) responses to the same question post-counseling; and (c) actual decisions by women about PND testing (had testing vs. no testing). After controlling for age and income, neither anticipated nor actual PND decisions were significantly associated with partner presence at the genetic counseling appointment ($p>.05$).

A slight variant of the above logistic regression analysis was performed to determine whether accompanied women could be differentiated from unaccompanied women on the basis of whether or not they had already reached a decision about PND before genetic counseling (regardless of what that decision might be). Responses to the pre-counseling question as to whether participants planned on having PND testing were collapsed into two categories: decided (yes/no) vs. undecided (uncertain). After controlling for age and family income, women's reports of having come to a decision before counseling did not significantly differentiate between those who were accompanied by their partners and those who were not ($p>.05$).

Data from the follow-up telephone survey were analysed using MANCOVA, with age and family income as covariates, partner presence as the between-subjects factor, and the seven Follow-up Telephone Survey items as dependent variables. Results indicated no significant differences between the two groups on any of the follow-up items ($p>.05$) – that is, the two groups were similar in their perceptions of the utility of the information provided during genetic counseling and in the degree of confidence in their PND-related decisions (Table 4).

Discussion

We studied the differences between women who attended prenatal genetic counseling for advanced maternal age (AMA) with their partners and those who attended alone, in a preliminary attempt to understand the role of partners in facilitating the experience of women with AMA counseling. The limited previous research on this topic has suggested a possible impact of partners in decisions by women about prenatal diagnosis (PND) by helping women to process and evaluate the large quantities of risk-related information

presented to them during genetic counseling (Browner & Preloran, 1999). Based on these findings, we hypothesized that greater reductions in anxiety and decisional conflict from pre- to post-counseling would be observed among women who were accompanied to the appointment by their partners. We further hypothesized that levels of post-genetic counseling decisional conflict and state anxiety would be significantly lower, and overall satisfaction with the counseling intervention significantly greater, among accompanied women. In general these hypotheses were not upheld, although some evidence for a supportive role of the partner was noted. Somewhat unexpectedly, it was the observed differences between accompanied and unaccompanied women *prior* to genetic counseling, as opposed to afterwards, that offered some insight into the possible significance of partners' presence. Women who were accompanied by their partners reported somewhat greater state and trait anxiety, more uncertainty about what decision to make, and a stronger need for support from others in reaching a decision, than did unaccompanied women. Therefore, accompanied women were not particularly "better adjusted" than unaccompanied women after attending genetic counseling with their partners; they were, instead, feeling somewhat more uncertain and anxious before the genetic counseling session began.

This finding suggests that presence of the partner may – at least in part – reflect a support-seeking coping strategy employed by women in response to feelings of anxiety and decisional uncertainty surrounding the issue of PND testing. Women who were feeling more conflicted about the decision may have wanted their partners with them in order to help them sort through the various options and come to a decision. In contrast, women who were already quite certain as to what choice they would make may not have thought it necessary to bring their partners. However, further analyses indicated that accompanied and

unaccompanied women could not be differentiated on the basis of whether or not they already knew what decision they would likely make about PND testing before the genetic counseling session began. It may therefore be the overall degree of certainty, rather than the simple fact of arriving at genetic counseling with a tentative decision already formed, that is more important in determining the attendance of the partner. An alternative explanation of the findings is that the presence of the partner at the genetic counseling session might somehow have contributed to greater anxiety and decisional conflict among women. The correlational nature of the results does not preclude this possibility.

On the Decisional Conflict Scale, accompanied women reported no greater difficulty than unaccompanied women in understanding the risks and benefits of PND or their relative importance. This finding is supported by the fact that accompanied women demonstrated similar PND-related knowledge compared with unaccompanied women. This suggests that the decisional support that partners provided was not that of imparting information. Women acquire significant knowledge about PND at the genetic counseling session (Drake et al., 1999) and partners may have been relied upon more for assistance in processing that information and applying it to their personal situation.

After genetic counseling, accompanied women continued to report higher levels of uncertainty regarding the PND decision than did unaccompanied women. It is possible that this group difference would dissipate following a longer delay, during which time the women would presumably be engaged in further discussions with their partners about PND testing. Although this could not be determined here, as follow-up administration of the DCS (e.g., one week post-counseling) was not carried out, the brief follow-up telephone survey did shed some light on this issue. After 24 weeks' gestation, there were no differences

between accompanied and unaccompanied women with regard to their reported confidence in their PND-related decisions (i.e., belief that they made the right decision and a lack of "second thoughts"). It is noteworthy that immediately after genetic counseling, accompanied and unaccompanied women no longer differed in scores on the Support subscale of the DCS, reflecting a small but significant interaction effect. This lends credence to the viewpoint that partners played a role in supporting women in coming to their decision.

Despite the fact that the pre-counseling differences in state anxiety also were no longer significant after counseling, results from mixed repeated measures MANCOVA did not provide evidence of a significant interaction between partner presence and change in anxiety over time. It is important to note that the effect size for this interaction was small, as was that mentioned above for the Support subscale of the DCS, thus suggesting that although attendance by the partner can be helpful for some women, it is not critical to the attainment of positive genetic counseling outcomes.

Contrary to the findings of Browner and Preloran (1999), the vast majority of participants viewed the PND decision as one to be shared with their partners, and not one to be made solely by them or by their partners. This could reflect potential sociocultural differences between the current sample and the Mexican-American sample studied by Browner and Preloran. Nevertheless, we found that the degree of anticipated joint decision-making was dependent upon whether the partner attended genetic counseling or not. Significantly fewer of the unaccompanied women viewed PND testing as a joint decision (75%, compared with 95% of accompanied women). This was the largest effect observed in the present study and it suggests that couples who attend prenatal genetic counseling together are more likely to view PND as a shared experience.

The lack of any significant difference between accompanied and unaccompanied women with respect to uptake of PND testing supports the findings of Kenen and colleagues (2000) and contradicts those of Browner and Preloran (1999). Neither the anticipated nor actual decisions of women were found to relate to the presence of their partners at the genetic counseling appointment. This suggests that partners played a more important role in supporting women through the process of reaching a decision than in determining the nature of the decision itself. Further research is needed to explore this distinction and to reconcile the conflicting results in the literature. Again, sociocultural factors might have relevance here; the potentially influential role of such factors in determining the process and outcome of couples' health-related decisions would constitute an interesting avenue for future research.

There are potential clinical implications of the present findings. Many genetic counselors instinctively may feel greater concern about women who attend AMA counseling alone. However, this may be misdirected because women who attend without their partners may be experiencing greater certainty and less anxiety than those who attend with their partners. It should be noted that the same may not necessarily be true when women are attending amniocentesis appointments or receiving diagnostic test results. Our findings also suggest that partners may play a role in assuaging the anxiety of women during the genetic counseling session and in giving them a sense of support in the decision-making process. Although there is no evidence to suggest that presence of the partner amplifies any benefits to women from genetic counseling (accompanied and unaccompanied women are comparable on post-counseling outcomes such as knowledge, anxiety, and overall satisfaction), women who start out feeling somewhat more distressed and uncertain about

PND, and those who have a greater tendency toward anxiety, may have a greater need for the involvement of their partner. For this reason, it would be prudent for genetic clinics to continue the practice of encouraging couples to attend genetic counseling together, so that those women who are experiencing any PND-related uncertainty and worry can benefit from support in the decision-making process.

An important caveat should be noted with regard to the interpretation of significant group differences reported in the present study. Although accompanied and unaccompanied women were found to differ statistically on many variables, the magnitude of these differences was generally quite small, usually amounting to one third or one quarter of a standard deviation (with the exception of differences in the degree of joint decision-making, which showed larger effects). Moreover, the levels of distress experienced by the women in this sample were well within the normal range regardless of partner attendance (e.g., mean state anxiety scores in both groups were comparable to or somewhat below the standardized population mean of 50). It is thus important to note that AMA women do not comprise a group at high risk for psychopathology or in need of intensive clinical intervention. They can, however, benefit from support in the process of deciding about prenatal genetic testing, and the involvement of their partners in this process can be helpful.

Among the limitations of this study was the short interval between the pre- and post-counseling assessments. The time frame, which was dictated by the practical realities of running the study in a functioning clinic, was likely too brief to fully reveal the role of the partner in the PND counseling experience. It did not allow for the potential effects of discussions between spouses that may well have occurred during the week following the genetic counseling session. Another limitation of the study was its focus on the perspective

of expectant mothers. Although pre- and post-counseling data were collected from all partners who attended the genetic counseling sessions, these data were of limited utility for the current purposes, given that data from non-attending partners were not available for comparison. It may be beneficial for future research to incorporate mailed questionnaires to be completed by non-attending partners. A final study limitation lay in the general nature of the state anxiety measure that was used both before and after genetic counseling. Participants' levels of anxiety about prenatal testing were not specifically assessed; therefore, it cannot be concluded with certainty that any elevations in pre-counseling state anxiety reflected concerns about PND testing per se, as opposed to the more general stresses associated with attending any medical appointment.

It is important to consider the present findings in light of the observed discrepancy in family incomes between accompanied and unaccompanied women. Although all of the principal analyses included statistical control for variations in family income, the potential implications of such variation deserve attention. The fact that unaccompanied women reported, on average, a lower family income than did accompanied women introduces the possibility that a certain proportion of partners who did not attend genetic counseling were unable to do so due to financial constraints of some kind. This could coincide with previous reports that the most commonly identified reason for partners' non-attendance at prenatal genetic counseling appointments was difficulty in getting time off work (Browner & Preloran, 1999; Kenen et al., 2000). It cannot necessarily be assumed, however, that lower-paying jobs tend to correspond with greater work responsibilities or less flexibility in working hours. Other potential implications of lower family income should be considered,

such as transportation and childcare issues associated with joint attendance at prenatal appointments.

Future areas of research stimulated by this initial study will include the self-reported reasons for attendance or non-attendance by partners at PND counseling sessions, the importance of partner support in contributing to the psychological adaptation of women to AMA counseling, the extent to which couples agree about PND testing, and how this agreement affects the psychological adaptation of women to the counseling and testing process. There is some preliminary evidence to suggest that disagreement between spouses is quite common (Kolker & Burke, 1994; Sorenson & Wertz, 1986). However, the implications of such disagreement need to be further studied. We are currently conducting a new study of AMA counseling to explore these and other partner-related issues in greater depth. To the extent that PND is an experience that carries important ramifications for both expectant parents, it is critical to further explore how various dimensions of the couple relationship can serve to facilitate – and in some cases, perhaps, to hinder – the adjustment of individuals to this experience.

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Table 1

Comparison of women whose partners accompanied them to genetic counseling and those who attended alone on (a) continuous and (b) categorical demographic variables

(a)

Variable	Partner Present (n=222) $\bar{X}$	SD	Partner Absent (n=123) $\bar{X}$	SD	Overall Sample (n=345) $\bar{X}$	SD
Age	36.52*	1.81	37.28*	2.52	36.79	2.12
Family Income[a]	9.70**	1.95	8.56**	2.72	9.29	2.32
Hours Worked/Week	37.88	10.80	38.37	16.30	38.05	12.96
Education Level[b]	4.68	1.40	4.46	1.27	4.60	1.36

(b)

Variable	Partner Present (n=222) No.	%	Partner Absent (n=123) No.	%	Overall Sample (n=345) No.	%
Have Children						
Yes	105	48	68	55	173	50
No	115	52	55	45	170	50
Ever had Spontaneous Abortion	75	38	33	30	108	35
Ever had Therapeutic Abortion	45	22	33	29	78	24
Language spoken most often at home						
English	191	87	102	83	293	85
French	14	6	11	9	25	7
Both	9	4	3	2	12	4
Other	6	3	7	6	13	4
Occupational Status						
Employed	192	87	104	85	296	86
Homemaker	22	10	14	11	36	10
Other	7	3	5	3	12	4

Note. Where numbers do not add up to total group n's, this is due to missing values.
[a]Responses are on an 11-point scale (1 = < $10,000; 9 [$\bar{X}$] = $80,000 - $89,999; 11 = $100,000+). [b]Responses are on an 8-point scale, representing highest level of education completed (1 = < high school; 5 [$\bar{X}$] = university bachelors degree; 8 = post-doctoral training).
*p<.01; **p<.001.

Table 2

Mixed repeated measures MANCOVA[a] evaluating differences on key study variables from pre- to post-counseling as a function of partner attendance at genetic counseling

Source	*df*	*F*	Partial η^2	*p*
		Between subjects		
Partner Presence	7	4.47***	.11	.00
Decision will be made jointly	1	21.29***	.07	.00
State anxiety (STAI)	1	2.27	.01	.13
Knowledge of PND	1	1.91	.01	.17
DCS Uncertainty subscale	1	7.46**	.02	.01
DCS Support subscale	1	1.95	.01	.16
DCS Information/values subscale	1	0.12	.00	.73
DCS PEDM subscale	1	1.19	.00	.28
Error	294			
		Within subjects		
Time	7	2.16*	.05	.04
Decision will be made jointly	1	1.71	.01	.19
State anxiety (STAI)	1	0.33	.00	.57
Knowledge of PND	1	0.50	.00	.48
DCS Uncertainty subscale	1	1.66	.01	.20
DCS Support subscale	1	0.54	.00	.46
DCS Information/values subscale	1	1.78	.01	.18
DCS PEDM subscale	1	5.25*	.02	.02
Time x Partner Presence	7	1.30	.03	.25
Decision will be made jointly	1	0.01	.00	.92
State anxiety (STAI)	1	2.61	.01	.11
Knowledge of PND	1	0.38	.00	.54
DCS Uncertainty subscale	1	0.28	.00	.60
DCS Support subscale	1	3.83†	.01	.05
DCS Information/values subscale	1	0.81	.00	.37
DCS PEDM subscale	1	2.46	.01	.12
Error	294			

Note. Partial η^2 (partial eta squared) is a measure of effect size; guidelines for interpreting magnitude of effects are: small = .01, medium = .06, large = .15 (Cohen, 1988). STAI = State-Trait Anxiety Inventory; PND = prenatal diagnosis; DCS = Decisional Conflict Scale; PEDM = perceived effective decision-making.

[a]Covariates were age and family income.

†p=.05; *p<.05; **p<.01; ***p<.001.

Table 3

Comparison of women whose partners accompanied them to genetic counseling and those who attended alone on pre- and post-counseling variables: MANCOVA results[a]

Variable/Survey Item	Partner Present (n=209)		Partner Absent (n=108)		
	$\bar{X}$	SD	$\bar{X}$	SD	Partial η^2
Pre-Counseling					
Decision will be made jointly with partner[b***]	1.34	0.74	1.89	1.21	.06
State anxiety (STAI)[c*]	48.00	10.42	45.70	9.48	.02
Trait anxiety (STAI)[c*]	43.97	9.20	42.10	8.41	.01
Depressive symptoms (CES-D)[d]	7.96	8.08	7.92	6.32	.00
Knowledge of PND[e]	13.80	3.41	13.12	5.38	.00
DCS Uncertainty subscale[f**]	12.37	3.77	10.74	4.01	.03
DCS Support subscale[g*]	8.27	1.76	7.68	1.80	.02
DCS Information/values subscale[h]	12.37	3.65	12.13	3.86	.00
DCS PEDM subscale[f]	9.15	2.48	8.37	2.80	.02
Post-Counseling					
Decision will be made jointly with partner[b***]	1.31	0.58	1.86	1.23	.07
State anxiety (STAI)[c]	46.97	10.21	46.06	9.82	.00
Knowledge of PND[e]	17.20	1.63	16.93	1.65	.00
DCS Uncertainty subscale[f*]	10.84	4.22	9.26	4.17	.02
DCS Support subscale[g]	5.80	2.02	5.51	1.84	.00
DCS Information/values subscale[h]	7.68	2.37	7.72	2.92	.00
DCS PEDM subscale[f]	7.32	2.64	6.94	2.77	.00
Intervention satisfaction (ISQ)[i]	38.21	5.89	38.51	5.62	.00

Note. n's are smaller than group sample sizes due to missing data on some measures. Partial η^2 (partial eta squared) is a measure of effect size; guidelines for interpreting magnitude of effects are: small = .01, medium = .06, large = .15 (Cohen, 1988). STAI = State-Trait Anxiety Inventory; CES-D = Center for Epidemiologic Studies – Depression scale; PND = prenatal diagnosis; DCS = Decisional Conflict Scale; PEDM = perceived effective decision-making.

[a]Covariates were age and family income. [b]Responses made on a 5-point Likert-type scale (1 = strongly agree; 5 = strongly disagree). [c]t-scores; $\bar{X}$ = 50, SD = 10. [d]Possible range = 0-60. [e]Possible range = 0-19. [f]Possible range = 4-20. [g]Possible range = 3-15. [h]Possible range = 5-25. [i]Possible range = 11-44.

*p<.05; **p<.01; ***p<.001.

Table 4

Comparison of women whose partners accompanied them to genetic counseling and those who attended alone on follow-up survey responses: MANCOVA results[a]

Survey Item	Partner Present (n=198)		Partner Absent (n=101)	
	$\bar{X}$	SD	$\bar{X}$	SD
The information given to me in genetic counseling prior to deciding on PND was helpful.	1.75	0.74	1.80	0.87
After deciding whether or not to have PND, I had second thoughts.	4.36	0.97	4.40	1.03
While awaiting my PND test results, I had second thoughts about my decision.	4.43	0.96	4.46	0.93
After receiving my PND test results, I had second thoughts about my decision.	4.69	0.59	4.70	0.67
The information I was given in genetic counseling prepared me well for the experience of PND.	2.04	0.78	1.94	0.76
I feel I made the right decision with regard to PND.	1.33	0.48	1.37	0.67
The approach to preparing for the possibility of PND was effective and does not need to be changed.	2.13	0.91	2.12	0.97

Note. PND = prenatal diagnosis. All responses made on a 5-point Likert-type scale (1 = strongly agree; 5 = strongly disagree).

[a]Covariates were age and family income.

Abstract

This study explored the significance of the partner and of the couple relationship in contributing to the individual and marital adjustment of 95 women who underwent prenatal genetic counseling and testing due to advanced maternal age (AMA). Participants completed self-report measures prior to genetic counseling (Time 1), during the waiting period for prenatal diagnostic (PND) test results (Time 2), and after normal results were received (Time 3). At Time 2, distress was predicted by the degree to which women approached the PND decision jointly with their partners, and marital adjustment was predicted by women's satisfaction with the support received from their partners. Marital adjustment at Time 3 was predicted by earlier levels of partner agreement about PND-related issues. The association between pre-counseling partner agreement and Time 3 well-being was mediated by women's use of relationship-focused coping (partner support seeking and empathic responding), and was moderated by women's satisfaction with the support received from their partners. Joint decision-making at Time 1 was linked to Time 3 adjustment indirectly, through women's satisfaction with their partners' support. Finally, women's use of avoidant coping strategies mediated the association between perceived partner support and Time 3 adjustment. Results suggest that aspects of the couple relationship have the potential to facilitate or hinder women's experience of PND counseling and testing, and thus constitute potentially important targets for intervention.

Keywords. Prenatal diagnosis; partner support; marital adjustment; coping

The Role of Women's Relationships With Their Partners in Their Adjustment Following Prenatal Genetic Testing

Prenatal genetic testing by amniocentesis and chorionic villus sampling has become a well-established obstetric procedure used in the care of women at increased risk for certain fetal genetic disorders (Almey et al., 2000; MacKay & Fraser, 1993). Advanced maternal age (AMA) remains the single most common clinical indication for prenatal diagnosis (PND) in North America (Cheschair & Hansen, 1999). In making the decision about whether or not to undergo a PND procedure, women and their partners must weigh a complex array of factors, including age-related risk information, the potential anxiety-alleviating benefits of a negative test result, the physical risks to the fetus associated with the procedure (Verp, 1992), and their own values and attitudes concerning pregnancy termination and the possibility of raising a child with a genetic disorder.

Given the complexity and personal significance of this decision, it is not surprising that fears about procedural complications and worry about the possibility of abnormal test results have been shown to accompany PND testing for a number of women (Cederholm, Axelsson, & Sjöden, 1999; Cederholm, Sjöden, & Axelsson, 2001; Chervin, Farnsworth, Freedman, Duncan, & Shapiro, 1977; Evers-Kiebooms, Swerts, & Van den Berghe, 1988; Sjögren & Uddenberg, 1989). Symptoms of distress and anxiety have been reported to occur at various times surrounding PND testing, particularly during the waiting period for test results (Chervin et al., 1977; Dixson et al., 1981; Evers-Kiebooms et al., 1988; Phipps & Zinn, 1986; Spencer & Cox, 1987). In most cases, this distress is time-limited and subsides once normal results are known (Fava et

al., 1982, 1983; Phipps & Zinn, 1986; Tercyak, Johnson, Roberts, & Cruz, 2001). In general, research has not shown large-scale psychological distress among women who choose to have prenatal genetic testing. Researchers have thus begun to highlight the importance of identifying contributing factors that might increase or decrease the likelihood of negative outcomes following PND (Tercyak et al., 2001). Moreover, if the experience of marked distress is limited to a minority of women, this raises questions regarding factors that might facilitate more positive adjustment outcomes.

In recent years there has been increasing recognition of the importance of considering the social context of stress, coping, and coping outcomes (O'Brien & DeLongis, 1997). A growing body of research suggests that interpersonal stressors (i.e., stressors that directly involve and affect more than one member of a family or social network) can have a particularly deleterious impact on psychological well-being and mood (Bolger, DeLongis, Kessler, & Schilling, 1989; O'Brien & DeLongis, 1997; Pagel, Erdly, & Becker, 1987; Schuster, Kessler, & Aseltine, 1990). The experience of prenatal genetic counseling and testing, with its emphasis on couple decision-making, certainly carries an interpersonal component and would be viewed appropriately as a potential interpersonal stressor, particularly when conflict or disagreement exists between spouses regarding testing. Women do not face the PND decision and testing experience in a social vacuum; their partners are directly involved and affected by the experience and thus have the potential to act not only as a source of comfort and support but also as a source of conflict and uncertainty.

The role of the partner in prenatal genetic testing for AMA, particularly as it pertains to women's coping and adjustment to the experience, has received little study.

Recently we reported a preliminary investigation of these issues in which we examined the potential meaning and significance of partner attendance at prenatal genetic counseling appointments (Humphreys, Cappelli, Hunter, Allanson, & Zimak, 2003). A substantial minority (36%) of women attended the appointments alone; these women, compared to those who were accompanied by their partners, reported significantly lower levels of pre-counseling state anxiety and decisional conflict. The role of significant others can be complex in the context of interpersonal stressors. The presence of the partner at the genetic counseling session could reflect a support-seeking strategy adopted by women to cope with feelings of anxiety and uncertainty surrounding the PND decision. Alternatively, in light of the inability to infer causality based on the study design, the opposite could be true: attendance by the partner could have engendered feelings of anxiety and decisional conflict in the women.

The above findings (Humphreys et al., 2003) raised numerous additional questions regarding the role of the partner and how women may draw upon their spousal relationships to cope with the PND counseling and testing experience. The present study set out to address some of these questions by eliciting more detailed information from women in a prospective, longitudinal fashion. The objectives of this study encompassed three main areas of interest. First, we sought to explore the specific reasons for the attendance or non-attendance of partners at AMA counseling. Second, we sought to explore how various aspects of the couple relationship might relate to women's adjustment following PND counseling and testing. Third, we sought to test a series of mediational models with an aim to identifying potential mechanisms through

which the relationship context might correlate with women's adjustment to prenatal testing.

With respect to the second main objective, it was hypothesized that the following five "relationship variables" would correspond with higher levels of well-being and marital adjustment and lower levels of distress: (i) the extent to which women agreed with their partners about PND testing and related issues prior to genetic counseling; (ii) the degree to which women viewed the PND decision as a joint one to be shared with their partners; (iii) women's satisfaction with the support received from their partners during prenatal counseling and testing; and their use of two relationship-focused coping strategies, namely (iv) seeking support from their partners and (v) empathic responding (defined below).

Although research suggests that the majority of PND decisions are reached jointly (Cederholm et al., 1999; Dixson et al., 1981) and that couples show fairly high levels of agreement with each other about the best course of action to take (Beeson & Golbus, 1985; Kolker & Burke, 1994; Sorenson & Wertz, 1986), exceptions to these trends are not uncommon. Browner and Preloran (1999) found that only 23% of their sample of Mexican-American women described the testing decision as a joint one, and other studies have shown that a substantial minority of women (from one quarter to one third) reaches the decision on their own (Cederholm et al., 1999; Dixson et al., 1981). A considerable body of literature further indicates that couples often differ in their views on prenatal testing (Beeson & Golbus, 1985; Kolker & Burke, 1994; Rapp, 1991), abortion following a positive test result (Kolker & Burke, 1994; Pauker & Pauker, 1987), the risk of having an affected child (Sorenson & Wertz, 1986), and the

seriousness of potential problems associated with raising an affected child (Sorenson & Wertz, 1986). Although not synonymous, both spousal agreement and joint decision-making could be said to denote a sense of unity, or togetherness, in the couple decision-making process. A potential link between these two concepts has not been investigated previously. Moreover, the extant literature has yet to move beyond the simple assessment of rates of PND-related couple agreement and joint decision-making to a more systematic exploration of the significance of these variables in predicting psychosocial outcomes.

Relationship-focused coping is defined as coping efforts geared toward managing and maintaining relationships during stressful periods (O'Brien & DeLongis, 1997). DeLongis and O'Brien (1990) have emphasized one mode of relationship-focused coping in particular: empathic responding. This refers to an individual's attempts to accurately perceive the affective world of others involved in a stressful situation and to communicate accurately and sensitively one's understanding of those persons (DeLongis & O'Brien, 1990). In the present study, the emphasis was placed on women's empathic responses directed specifically toward their partners. In addition, the seeking of support from one's partner was conceptualized as a second form of relationship-focused coping as it also involves using one's intimate relationships to manage a stressor or significant transition.

With respect to the third study objective, the hypothesized mediational models included various combinations of the above relationship variables and some individual variables such as decisional conflict and individual coping strategies (problem solving and avoidant coping). Among the models was a test of the hypothesis, introduced by

our previous findings (Humphreys et al., 2003), that women's use of relationship-focused coping strategies (e.g., seeking support from their partners) might be influenced by the degree to which they experience PND-related decisional conflict prior to genetic counseling (Model 1 below). In the present study we chose to focus on decisional conflict, and not state anxiety, because a much smaller effect size for anxiety had been observed in our previous research (Humphreys et al., 2003). The following mediational hypotheses were investigated:

(1) The association between women's pre-counseling levels of decisional conflict and their post-testing adjustment was hypothesized to be mediated by their use of relationship-focused coping strategies (Model 1).

(2) The association between women's pre-counseling reports of PND-related unity (partner agreement and joint decision-making) and their post-testing adjustment was hypothesized to be mediated by: (a) their use of relationship-focused coping strategies (Model 2) and (b) their satisfaction with the support received from their partners (Model 3).

(3) The association between women's satisfaction with their partners' support and their post-testing adjustment was hypothesized to be mediated by their use of problem-solving (Model 4) and avoidant (Model 5) coping strategies.

The specific directions of the hypothesized effects in Models 1 through 5 are illustrated in Figure 1. In the above statements, "adjustment" refers collectively to measures of distress, well-being, and marital adjustment. As noted earlier, it is important to consider not only predictors of negative psychological outcomes (e.g., anxiety, depressive symptoms) but also predictors of positive adjustment (i.e., well-

being), so as to identify both risk factors and protective factors that may contribute to women's adaptation to the PND counseling and testing experience. Although correlated, research has shown that psychological distress and well-being are distinct and that sufficient unshared variance remains between them to categorize them as separate components of overall adjustment (Diener, 1994; Lucas, Diener, & Suh, 1996; Manne, Pape, Taylor, & Dougherty, 1999; Noor, 1996; Rafanelli et al., 2000). Moreover, given the focus of this study on the relational context of women's experience with PND, it was important not to limit the investigation solely to individual outcomes. The inclusion of a marital dimension is particularly relevant in this context, and therefore women's reports of marital adjustment constituted a third component of their overall adjustment assessed here.

Method

Participants

Participants were 95 women referred to the Children's Hospital of Eastern Ontario (CHEO) genetics clinic by their primary physicians between January 2002 and February 2003. Only women whose clinical indication for PND was maternal age over 35 (AMA) were included in the study, as this is the most common reason for referral and we wanted a relatively homogeneous sample. All participants resided within the Ottawa-Carleton regional area of nearly one million.

Inclusion criteria. (a) age $\geq$ 35 years at time of delivery; (b) gestational age $\leq$ 18 weeks; (c) fluency in English; (d) no significant family history of a genetic disorder; (e) first time having PND counseling; and (f) currently in a relationship with a partner. Any woman having a multiple pregnancy of three or more was excluded from the study.

Although data were collected from a larger number of women referred for genetic counseling, only those who chose to have a PND procedure and whose test results were normal were included in the main analyses, to ensure that the nature of the PND experience was similar across the sample.

Measures

The Prenatal Diagnosis Questionnaire (PDQ): The PDQ is a 30-item self-report questionnaire designed to assess women's risk perceptions, knowledge of prenatal diagnosis, sociodemographic variables, reasons for partner attendance or non-attendance, partner agreement regarding PND, and the degree of joint decision-making. The full PDQ was administered to women prior to genetic counseling, whereas a shorter and slightly modified version was administered following prenatal genetic testing. Some of the items from the PDQ were based on versions used in our previous research (Humphreys et al., 2003; Hunter et al., 2003), whereas those pertaining to the following themes were designed specifically for the current study:

(a) *Pre-counseling partner agreement*: assessed with three items to explore women's perceptions of the extent to which they agree with their partner about (i) whether or not to have prenatal genetic testing; (ii) what they would do in the event of a positive diagnosis; and (iii) how they would feel about raising a child with Down syndrome or a neural tube defect. Responses are made on a five-point scale ranging from "We do not agree at all" to "We agree completely," with a sixth response option of "We have not discussed it yet." Endorsement of the latter response option was analyzed separately and treated as a missing value in the calculation of the overall agreement score, which took the mean of the remaining item responses for each participant, divided by the number of response options

(five), yielding a proportional value. Overall agreement scores thus ranged from a minimum of .20 (i.e., 1 out of 5, or low agreement) to a maximum of 1.00 (i.e., 5 out of 5, or high agreement). The three pre-counseling agreement items formed a scale with good internal consistency (Cronbach's $\alpha = .84$).

(b) *Post-testing partner agreement*: assessed with the second and third agreement items described above; the first item was omitted as the testing decision had already been determined. The possible range of overall agreement scores was identical to that for pre-counseling agreement. Internal consistency for the two post-testing agreement items was found to be good (Cronbach's $\alpha = .85$).

(c) *Degree of joint decision-making*: Prior to genetic counseling, women were asked the extent to which they anticipated the PND decision would be shared with their partners; following testing, they were asked how involved their partners had been in reaching the decision to have testing. Although most responses were expected to be made within a four-point scale ranging from "No involvement" to "Complete involvement," additional response options were provided to allow for the possibility that in some cases the partner might play a greater role than the participant in the decision. The scaling of these additional response options mirrored that described above and could thus be incorporated into a single four-point scale ranging from completely unilateral to completely joint decision-making.

(d) *Reasons for partner's attendance/non-attendance* (post-testing only): assessed with a series of items reflecting possible reasons why the partner may or may not have attended the genetic counseling and/or genetic testing appointments. Respondents were asked to indicate how important each potential reason was in their case, on a four-point scale

ranging from "Not at all important" to "Very important." They were also given the opportunity to state any reasons of their own that were not included in the pre-set questions.

Decisional Conflict Scale (DCS): The DCS (O'Connor, 1995) is a 16-item self-report measure designed to assess levels of decisional conflict associated with a specified upcoming health decision. Decisional conflict is defined as a state of uncertainty about the course of action to take and often occurs when choices involve risk or uncertainty of outcomes, high stakes in terms of potential gains and losses, and anticipated regret over the positive aspects of the rejected option(s). For the current study, instructions specified that participants consider the items in the context of the decision about whether or not to undergo PND testing. Responses are made on a 5-point Likert-type scale. Higher scores indicate greater decisional conflict. The DCS has been found to discriminate significantly between patients who express certainty versus uncertainty regarding decisions to continue with medication treatment (Bunn & O'Connor, 1996) and decisions to decline or accept an influenza vaccine (O'Connor, 1995). Test-retest reliability is adequate over a two-week period ($\underline{r} = .81$; O'Connor, 1995), and alpha coefficients range from .78 to .92, indicating adequate internal consistency (O'Connor, 1995).

Coping Strategies Indicator (CSI): The CSI (Amirkhan, 1990) is a 33-item self-report questionnaire designed to assess the extent to which respondents have used various strategies to cope with a particular stressful experience. At the start of the questionnaire, written directions instruct respondents to apply all items to a specific situation (in this case, the experience of PND counseling and potential testing). Responses on the original CSI were on a 3-point scale (a lot, a little, or not at all). The response format was modified for the current study to include five options instead of three: almost always, quite a bit, moderately, a little

bit, and not at all. This change was made to increase the variability of scores on this measure.

The CSI is comprised of three orthogonal subscales: "Problem Solving," "Seeking Social Support," and "Avoidance" (Amirkhan, 1990). The original "Seeking Social Support" subscale was a more generic measure referring to "others" rather than to one's partner; minor wording changes were made to specifically assess partner support seeking. In addition, six Empathic Responding items were interspersed throughout the CSI, in accordance with DeLongis' recommendation that this dimension of relationship-focused coping be assessed by embedding the items within a general coping assessment (personal communication, October 16, 2001). Examples of Empathic Responding items include: "Tried to understand your partner's concerns" and "Tried to experience what your partner was feeling." All of the items, developed by DeLongis and colleagues, have been published elsewhere (O'Brien & DeLongis, 1996).

The CSI displays good test-retest reliability over a two-month period (Pearson $\underline{r}$ = .83, .80, and .82 for Problem Solving, Seeking Social Support, and Avoidance, respectively; Amirkhan, 1990). These values are based on a sample of 87 introductory psychology students who were asked to respond to the items in relation to any stressor they had personally experienced recently. Amirkhan (1990) obtained similar test-retest correlations over the same time period in a community sample ($\underline{n}$ = 92) from the general population. The CSI has demonstrated high internal consistency (α = .93 for Seeking Social Support, α = .89 for Problem Solving, and α = .84 for Avoidance; Amirkhan, 1990). Convergent validity of the CSI is demonstrated by its association with personality dispositions in ways suggested by

the coping literature; furthermore, tests of discriminant validity have shown the CSI to be independent of social desirability biases (Amirkhan, 1990).

The Empathic Responding items have been shown to be internally consistent (α = .93) and to be uncorrelated with two dimensions of social desirability bias: impression management and self-deceptive enhancement (O'Brien & DeLongis, 1996). Hierarchical multiple regression analyses have demonstrated that after controlling for other types of stressful situations (e.g., agentic situations), communal (interpersonal) situations are independently predictive of the use of empathic responding; the association is particularly strong for "close communal" situations involving a spouse or family member, thus indicating that stress occurring in close personal relationships tends to pull for empathic responding (O'Brien & DeLongis, 1996). These findings provide evidence for the validity of the Empathic Responding items as indicators of relationship-focused coping.

Support Behaviors Inventory (SBI): The SBI (Brown, 1986a) is a 45-item self-report questionnaire designed to assess individuals' satisfaction with the support they receive from their partners. The SBI was developed on a sample of expectant parents (Brown, 1986a). Half of the items make specific reference to pregnancy and half are applicable to any population. Only the 22 pregnancy-related items were used in this study. Respondents are asked to indicate their degree of satisfaction or dissatisfaction about each support behaviour on a 6-point rating scale from 1 (very dissatisfied) to 6 (very satisfied). Responses on all items are summed to produce a total score, with higher scores indicating greater satisfaction. Although separate psychometric properties have not been reported in detail for the pregnancy-related items of the SBI, Brown (1986b) stated that the reliabilities and intercorrelations of the pregnancy and non-pregnancy subscales were virtually identical to

the data obtained for the overall scale. The overall partner support scale has demonstrated excellent internal consistency (Cronbach's $\alpha = .97$; Brown, 1986b). No test-retest reliability information has been reported for the overall SBI; however, an 11-item short form of the scale has been shown to be moderately stable over time ($\underline{r} = .78$ over a time period ranging from 6-56 days; Curry, Campbell, & Christian, 1994). The SBI has been used to assess satisfaction with partner support in numerous samples of expectant parents (Brown, 1986a, 1986b, 1994; Kemp & Hatmaker, 1989; McVeigh, 2000).

Profile of Mood States – Short Form (POMS-SF): The POMS-SF (Shacham, 1983) is a 37-item self-report measure designed to assess levels of psychological distress in six different domains: tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment. It also provides an overall index of mood disturbance. Only the total mood disturbance score was used for the present study. All items on the scale are single-word adjectives and respondents are asked to indicate the degree to which each adjective describes how they have felt over the preceding week; responses are made on a 5-point scale ranging from "Not at all" to "Extremely." Although developed on a sample of cancer patients, the POMS-SF has since been used to assess psychological distress in a variety of populations, including bone marrow transplant recipients (Baker, Curbow, & Wingard, 1991), seriously ill patients and their families (Oye, Landefeld, & Jayes, 1990), men with HIV or AIDS (Moulton, Stempel et al., 1991; Moulton, Sweet et al., 1987), pregnant women seeking genetic counseling for AMA (Tunis et al., 1990), and adults in the general population (Labott et al., 1990). The total mood disturbance score and the subscale scores are highly correlated with their counterparts on the original POMS (all Pearson $\underline{r}$ values above .95; Curran, Andrykowski, & Studts, 1995; Shacham,

1983). The original POMS has been demonstrated to be sensitive to changes over a short time span (Little & Penman, 1989). A modified version of the POMS-SF has been shown to yield significant differences between the winners and losers of a sports competition (Grove & Prapavessis, 1992). Internal consistency of the total mood disturbance scale has been shown to be high (α = .90; Curran et al., 1995).

Scales of Psychological Well-Being (PWB): The PWB (Ryff, Lee, Essex, & Schmutte, 1994) is an 18-item self-report questionnaire designed to assess psychological well-being across six dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Responses to each item are made on a 6-point scale ranging from "Strongly Disagree" to "Strongly Agree." Each subscale contains three items; this represents an abbreviation of the more frequently used 9-, 14-, and 20-item subscales (Ryff, 1989). However, since only the overall well-being score was to be used for this study, a briefer measure was deemed sufficient. The PWB Scales hold some distinct advantages over other extant measures of well-being. Research by Ryff (1989) has shown that the sole emphasis on positive mood seen in many other measures of well-being is erroneous, as the construct of well-being is considerably broader than mere positive affect. The PWB Scales represent a more complex and theory-based definition of positive psychological functioning (Ryff, 1989).

Although psychometric data have yet to be published for the 3-item scales, the psychometric properties of the 14-item scales have been shown to be excellent. Each scale correlates highly ($\underline{r}$ = .97 to .99) with its 20-item parent scale, and internal consistency coefficients range from α = .83 for autonomy to α = .91 for self-acceptance (Kling, Ryff, & Essex, 1997). Test-retest reliability over a 6-week period has been found to range from $\underline{r}$ =

.81 to $\underline{r}$ = .88 (Ryff & Essex, 1992). The scales have also been found to correlate significantly and positively with other commonly used measures of positive psychological functioning, and to correlate negatively with other measures of psychological distress, thus demonstrating convergent and discriminant validity (Ryff & Singer, 1996). Finally, the scales have been shown to be sensitive to changes over time (Kling, Ryff et al., 1997; Kling, Seltzer, & Ryff, 1997). Internal consistency for the shorter version of the scale was found to be acceptable across the three assessments in the current sample, with Cronbach's alpha values ranging from .74 to .84.

Abbreviated Dyadic Adjustment Scale (ADAS): The ADAS (Sharpley & Rogers, 1984) is a 7-item self-report measure designed to assess individuals' level of adjustment in their marital relationship. The scale is a short form derived from the widely used original Dyadic Adjustment Scale (DAS; Spanier, 1976). Three items assess respondents' perceptions of the degree to which they usually agree with their partner on various matters, using a 6-point Likert-type scale ranging from "always agree" to "disagree." Three items measure the frequency with which the couple engages in various activities together, using a 6-point scale ranging from "never" to "more often [than once a day]." One item assesses respondents' perceptions of the overall degree of happiness in their relationship, with responses on a 7-point scale ranging from "extremely unhappy" to "perfect."

The ADAS has been shown to have acceptable internal consistency, with Cronbach's alpha coefficients ranging from .76 (Sharpley & Rogers, 1984) to .82 (Hunsley, Pinsent, Lefebvre, James-Tanner, & Vito, 1995) in combined male-female samples, and .84 among females alone (Hunsley et al., 1995). Corrected item-total correlations for the ADAS have all been shown to be in the acceptable range (Hunsley et al., 1995; Sharpley & Rogers,

1984), indicating that the items represent a homogeneous set of indices of marital adjustment, none of which are redundant. The ADAS has successfully differentiated between individuals who are dissatisfied with their marriages, according to external criteria, and those who remain together (Sharpley & Rogers, 1984). Construct validity of the scale is further established by the fact that its correlations with other marital adjustment measures are comparable to corresponding correlations using the original DAS (Hunsley et al., 1995).

Procedure

The study was approved by the CHEO Research Ethics Committee. A prospective, longitudinal design was used, spanning three different time points during pregnancy (Figure 2). At the time of referral to the CHEO genetics clinic, initial intake data were obtained from patients; a research assistant (RA) reviewed the intake data and telephoned all women who appeared to meet the inclusion criteria for the current study. During the initial phone call, the RA explained the nature and purpose of the study, reviewed the inclusion criteria, and obtained informed consent. All women, regardless of whether or not they participated in the study, received the standard clinical care at CHEO, which consisted of a one-hour group genetic counseling session. The genetic counselors were not aware of the group members' participation status.

Those who agreed to participate in the study were sent the initial survey package by mail (Time 1), to be completed prior to the genetic counseling appointment and returned to the clinic on the day of the appointment. Due to the lengthy nature of this initial survey package, it was deemed less burdensome to administer it by mail than over the telephone; the subsequent assessments were conducted by phone, however, as they were briefer and the timing needed to be quite precise (Figure 2).

Within one week following their genetic counseling session, participants were telephoned by the RA and asked if they had reached a decision regarding testing. If they had not yet decided, the RA arranged to phone them back later to inquire about their decision. For those who decided to have testing, the first telephone interview was scheduled for approximately one week following the date of the PND procedure, during the waiting period for the test results. For those who decided against testing, the first telephone interview was scheduled for when they reached around 17 weeks' gestation, to correspond approximately with the timing of the interviews for those who had testing.

At the pre-arranged time, the RA telephoned participants and conducted the first telephone interview. This involved the telephone administration of the Time 2 measures (Figure 2). The RA also verified whether or not participants had undergone prenatal testing, and if so, what type of procedure they had undergone. She also verified that none of the participants who opted for testing had received their results yet. At the end of the 20-minute interview, the RA scheduled an appointment for the final assessment, which was to occur when participants had reached approximately 23 weeks' gestation; for those who had undergone testing, this would occur after they had received their test results. At the prearranged time, the RA phoned the participants and conducted the final, 10-minute interview, which involved the telephone administration of the Time 3 measures (Figure 2).

As noted earlier, the time-sensitive nature of the various assessments, particularly Time 2, led us to administer the latter two survey packages by telephone, whereas the initial, longer package was sent by mail. In order to check for equivalency of results across the different formats of survey administration, we decided in advance to administer *all* measures for the first 20 participants by mail only. Results for these participants could then be

compared to those for the rest of the sample to determine whether switching to a telephone format partway through the study had any bearing on the findings. To account for attrition and for an expected 10% of women to opt against having PND (based on our clinic statistics from the previous year), we used an all-mail survey format for the first 30 women who agreed initially to participate. Each of these women received all three of the survey packages at once in separate, sealed envelopes with clear instructions regarding when to complete and return each package. The findings of the format comparisons are summarized below.

Results

Recruitment

Within the one-year time period of the study, a total of 306 women were telephoned and invited to participate; of these, 20 (6.5%) indicated that they were not interested, 24 (8%) were found not to meet at least one of the inclusion criteria, 8 (3%) could not be reached in time, and 4 (1%) initially agreed to participate but had a spontaneous abortion prior to the scheduled genetic counseling session. This resulted in a total of 250 women who were eligible and agreed to participate in the study. Of these, 53 (21%) did not return the Time 1 survey package to the clinic on the day of their genetic counseling appointment. Of the remaining 197 participants, 170 (86%) remained in the study through to the final time point. Twenty women withdrew after Time 1, either because they were no longer interested (n=3), because of a language barrier (n=1), or because they had had either an induced abortion (n=1) or a spontaneous abortion (n=15). An additional 7 women withdrew from the study after completing Time 2; one was no longer interested, one had undergone an induced abortion, and five had experienced a spontaneous abortion. Of the 177 participants for

whom Time 2 data (including the test decision) were available, 99 (56%) chose to have PND (two women had chorionic villus sampling and the remainder had amniocentesis). Four of these women were among those who withdrew after Time 2, one of whom reported having received a positive PND test result; this was the above-noted participant who had an induced abortion after Time 2. This yielded a final sample of 95 women who underwent prenatal testing with normal results and no pregnancy loss.

Preliminary Analyses

Data Screening:

Prior to running the main analyses, which involved the use of multiple regression and structural equation modeling techniques, the data were screened for accuracy of data entry and for any violations of assumptions inherent to multivariate analyses. A few cases with missing data were identified and the sample mean substitution method was used, as the rate of missing data was less than 5% in all cases (Tabachnick & Fidell, 1996). Four variables were transformed to reduce skewness and improve the normality, linearity, and homoscedasticity of residuals. Square root transformations were used on the measures of partner support seeking and perceived partner support. Logarithmic transformations were used on the measures of partner agreement and degree of joint decision-making. No significant outliers were found among the cases, nor was there evidence of multicollinearity or singularity.

To identify potential covariates to be included in multiple regression analyses, bivariate correlations were computed between all criterion variables (the three adjustment measures at both Time 2 and Time 3) and key sociodemographic variables (age, family income, knowledge of PND, perceived risk of a positive test result, parental status,

psychiatric history, and attitudes toward abortion). Results are displayed in Table 1. Only a positive psychiatric history correlated significantly with Time 2 psychological distress ($p<.05$). None of the variables were significantly correlated with Time 3 distress ($p>.05$). Time 2 well-being was positively correlated with age ($p<.05$) and knowledge of PND ($p<.01$) and negatively correlated with a psychiatric history ($p<.05$). In contrast, only knowledge was significantly and positively correlated with well-being at Time 3 ($p<.01$). A psychiatric history was significantly and negatively correlated with marital adjustment both at Time 2 ($p<.05$) and Time 3 ($p<.01$). To control for these significant associations in subsequent multiple regression analyses, variables identified as significant in the above correlational analyses were entered in the first step whenever the corresponding adjustment measure served as the criterion variable.

Testing for Format Effects:

Due to attrition and to the unexpectedly high proportion (44%) of women opting against PND, the original target of obtaining all-mailed data across all three time points was only met for 12 of the first 30 participants. In order to have equal groups for comparison, these 12 participants were compared with the first 12 participants in the "mixed format" category, using independent-samples t-tests. The two groups were compared on key study variables assessed at Time 2 or Time 3 (they were assumed to be equivalent on all Time 1 measures since both groups completed these by mail). Significant differences were found with respect to two variables. Women who completed all of the measures by mail reported significantly greater satisfaction with their partners' support (at Time 2), and significantly higher levels of marital adjustment (at Time 3), than did women who completed the second and third assessments over the phone ($p<.05$; Table 2). Although not a complete solution to

this issue, the format of survey administration was included as an additional, dummy-coded covariate in the first step of any subsequent multiple regression analyses that involved Time 3 marital adjustment as the criterion variable.

Descriptive Statistics - Sample:

Participants ranged in age from 34 to 42 years, with a mean of 37 years. Less than half (41%) of the sample had at least one child prior to the current pregnancy. Almost all of the women were either married or living common-law, whereas three participants reported that they had a partner but were not married/common-law at the time of the initial assessment. On average, participants had achieved a relatively high level of education and were of high socioeconomic status (Table 3).

Principal Analyses

Partner attendance/non-attendance:

Among women who underwent prenatal testing, the great majority (83%) reported that their partners had attended the genetic counseling appointment. An even higher proportion (93%) indicated that their partners had attended the appointment for the actual PND procedure. Participants' stated reasons for attendance by their partners at both appointments are summarized in Table 4; the corresponding reasons for partner non-attendance are displayed in Table 5. The majority (57%) of accompanied women reported that the most important reason for their partners' attendance at genetic counseling was that they viewed it as a shared/couple experience. However, a number of other reasons were endorsed quite frequently: partners were said to provide women with emotional support during the genetic counseling session, to assist them in reaching a decision about testing, and to want more information for themselves about PND options. Of the 16 women who

attended alone, 10 (62%) cited work conflicts as the most important reason for their partners' non-attendance. Other endorsed reasons were that women did not feel a strong need to have their partners at the appointment, they already knew what decision they would make before the session, and they viewed PND as their own personal decision. Similar findings were observed with regard to the reasons for partner attendance and non-attendance at the PND procedure, although the provision of emotional support appeared to be a more important role for partners at that appointment (Tables 4 and 5).

Partner unity:

Prior to genetic counseling, the majority of women (67%) anticipated that the PND decision would be completely shared with their partners; a substantial number anticipated that although the final decision would be their own to make, their partners would contribute either a great deal (21%) or somewhat (8%) to the decision-making process. Only 3 women (3%) anticipated no involvement from their partners in making the decision, and none of the participants anticipated that their partners' contribution would be greater than their own. At Time 2 (while awaiting test results), the same proportion of women (67%) reported that the decision had been made with their partners. None of the women reported that they had made the decision completely on their own, and one woman reported that her partner had been responsible for the final decision, although she had contributed substantially to the process.

With regard to their views about prenatal testing, 76% of women reported that they agreed completely with their partners prior to genetic counseling. A somewhat smaller proportion (55%) indicated that they agreed completely about what they would do in the event of a positive test result, and 51% agreed completely on how they would feel about raising a child with Down syndrome or a neural tube defect. When the latter two questions

were asked again at Time 2, the rates of complete agreement were higher than reported previously (73% and 70%, respectively); Chi-square tests revealed that this change was significant ($p<.001$).

Correlates of Adjustment:

The following "relationship variables" were included in analyses of their relation to both Time 2 and Time 3 levels of distress, well-being, and marital adjustment: (log of) Time 1 partner agreement; (log of) Time 1 anticipated joint decision-making; (square root of) partner support seeking; empathic responding; and (square root of) perceived partner support. Bivariate correlations among key study variables are listed in Table 6. Numerous significant correlations were observed, particularly for Time 2 adjustment outcomes. Each of the relationship variables was significantly correlated with at least one of the adjustment measures at Time 2 and/or Time 3.

Correlates of Time 2 Adjustment. Hierarchical multiple regression analyses were performed to determine the relative contribution of the various relationship variables to adjustment outcomes at Time 2. Independent variables were entered in three separate blocks. The first block included Time 1 levels of the relevant adjustment outcome, along with any covariates as determined above. The second block was comprised of the two relationship variables that were assessed at Time 1: (log of) partner agreement and (log of) anticipated joint decision-making. Finally, the remaining three relationship variables, all assessed at Time 2, were entered together in the final block. As all three of the outcome variables were being analyzed in association with the same relationship variables, a corrected probability level of .05/3 = .017 was used to evaluate statistical significance. Results are displayed in Table 7. After controlling for prior levels of distress and psychiatric

history, the Time 1 relationship variables contributed significantly to the variance in Time 2 distress (change in [Δ] R^2 = .07, p<.017). This was mainly attributable to (log of) degree of anticipated joint decision-making, which accounted for 5% of unique variance in Time 2 distress (p<.017). The block of Time 2 relationship variables did not make a significant contribution after controlling for the variables in the previous two blocks (ΔR^2 = .02, p>.017).

Neither the block of Time 1 relationship variables (ΔR^2 = .02, p>.017) nor the block of Time 2 relationship variables (ΔR^2 = .00, p>.017) contributed significantly to the variance in Time 2 well-being after controlling for prior levels of well-being and other covariates. In turn, the Time 1 relationship variables did not contribute significantly to the variance in Time 2 marital adjustment after controlling for prior levels of marital adjustment and psychiatric history (ΔR^2 = .02, p>.017). However, Time 2 relationship variables did make a significant contribution to Time 2 marital adjustment after controlling for the variables in the previous two blocks (ΔR^2 = .36, p<.017). (Square root of) perceived partner support was the key predictor in this case, accounting for 32% of unique variance in Time 2 marital adjustment (p<.017).

Correlates of Time 3 Adjustment. The same statistical procedures were followed for Time 3 adjustment outcomes as described above for Time 2 outcomes. The results are displayed in Table 8. In the case of all three outcome variables, neither the block of Time 1 relationship variables nor the block of Time 2 relationship variables made a significant contribution to the variance after controlling for the appropriate covariates (p>.017). The only unique association, which just reached corrected significance levels, was the

contribution of (log of) Time 1 partner agreement to the variance in Time 3 marital adjustment (sr^2 = .05, p=.017).

Testing Mediational Models:

Figure 1 illustrates the specific predictor, mediator, and outcome variables within each hypothesized mediational model. Following the typical conventions, observed variables are indicated by rectangles and latent variables are indicated by ovals. Prior to formal testing of mediation hypotheses, the zero-order correlations among the variables in each model were examined to determine whether a complete mediational analysis was warranted. In models with proposed latent variables, a significant ($p<.05$) bivariate correlation between at least one of the observed variables comprising each latent variable was deemed sufficient justification to test the full model. Based on inspection of Table 6, Model 1 was dropped due to a non-significant correlation between decisional conflict and either of the two relationship-focused coping strategies. Likewise, Model 4 was dropped due to the non-significant correlation between perceived partner support and problem solving. The remaining three models were retained and the corresponding mediation hypotheses were tested using the Amos 4.0 (Arbuckle & Wothke, 1995) software package for structural equation modeling (SEM). The Maximum Likelihood estimation method was employed to estimate all models. In addition to examining the Chi-square statistic for each model, fit was also assessed via the Root Mean-Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Adjusted Goodness of Fit Index (AGFI). The following heuristics for each index were used for interpreting good fit: (a) the RMSEA should be less than .05 (Browne & Cudek, 1993), and the CFI, GFI, and AGFI should be greater than .90 (Hoyle, 1995). Due to the relatively small sample size, the models were

tested separately rather than being combined into a larger, more complex model, so as to maximize the cases-to-parameters ratio in each analysis, and to simplify the hypothesized models at this early stage of research in the area.

As recommended in the literature (Holmbeck, 1997; Hoyle & Smith, 1994), a three-step approach was used to test mediation effects with SEM. In the first step, the fit of the direct effect between the predictor variable and the outcome variable was assessed. Assuming an adequate fit, the next step involved assessing the fit of the mediational model, including predictor (A), mediator (B), and outcome (C). At this point the paths between predictor and mediator (A → B) and between mediator and outcome (B → C) were examined. If all direct paths were significant in the predicted directions, the final step then involved assessing the fit of the full model under two conditions: (a) when the A → C path was constrained to zero, and (b) when the A → C path was not constrained. It was then determined whether the latter variant of the model provided a significant improvement in fit over the first, by testing the difference between the two model chi-squares. If the addition of the A→ C path to the constrained model did not improve the fit (i.e., if there was no significant difference between the two variants of the model), then it was concluded that a full mediation effect had been found (Holmbeck, 1997).

The initial test of Model 2 indicated that it provided a good fit to the data; however, the factor structure of the latent Unity variable was not supported in the measurement model. Therefore, a modified version of the model was tested, in which (log of) Time 1 agreement served as the single observed predictor variable (joint decision-making was removed from the model as it had not shown a significant zero-order correlation with either of the relationship-focused coping strategies). After the modification, the model continued to

provide a good fit to the data (Table 9); the factor loadings for both of the remaining latent variables (Relationship-Focused Coping and Adjustment) onto their respective indicators were significant. Although the paths from predictor to outcome and from predictor to mediator were both statistically significant ($p<.05$), that from Relationship-Focused Coping to Time 3 Adjustment was not ($p=.07$; Table 10). Therefore, full support for a mediation effect was not obtained.

One additional modification was performed for Model 2, based on a re-examination of the corresponding zero-order correlations. Given that the only Time 3 adjustment variable to show a significant bivariate correlation with relationship-focused coping was well-being, and that (log of) Time 1 partner agreement was also significantly correlated with Time 3 well-being, it was expected that isolating this effect would allow for a more powerful analysis, due to the removal of the less relevant outcome variables. Therefore, the model was tested with Time 3 well-being as the single, observed outcome variable. With this modification, the final model provided a good fit to the data (Table 9) and all of the direct constituent paths were significant ($p<.05$, Table 10). A comparison of the model with and without the A→ C path constrained to zero indicated support for a full mediation effect, as the addition of the A→ C path to the constrained model did not significantly improve the fit. The model and parameter estimates for the final Model 2 are presented in Figure 3.

Prior to running the analysis for Model 3, a modification was made on the basis of the above-noted poor factor structure of the latent Unity variable. In this case (log of) Time 1 anticipated joint decision-making was retained as the single observed predictor variable, as it had demonstrated a significant zero-order correlation with partner support whereas (log of) Time 1 partner agreement had not. An additional modification was made based on the non-

significant zero-order correlations between (log of) Time 1 anticipated joint decision-making and any of the Time 3 outcome variables: this suggested the possibility of an indirect, rather than a mediated, effect, given the apparent lack of a direct A→ C association (Holmbeck, 1997). Therefore, Model 3 was tested as an indirect effect and not as a mediation effect. The modified Model 3 provided a good fit to the data (Table 9), and both of the constituent paths (from joint decision-making to partner support and from partner support to Adjustment) were significant ($p<.05$, Table 10). Therefore, support for an indirect effect was obtained. The model and parameter estimates for the final Model 3 are presented in Figure 4.

Model 5 provided a good fit to the data (Table 9) and all three direct paths were significant ($p<.05$, Table 10). Comparison of the model with and without the A→ C path constrained to zero indicated the presence of a full mediation effect, as the addition of the A→ C path to the constrained model did not significantly improve the fit. The model and parameter estimates for Model 5 are presented in Figure 5.

Secondary Analysis

Testing Potential Moderating Effect of Partner Support:

Given that considerable previous research has framed social support as a stress-buffering (i.e., moderating) variable (Eckenrode & Wethington, 1990; Lepore, Evans, & Schneider, 1991), a secondary analysis was performed to explore whether partner support might be more aptly viewed as a moderator of the relation between partner agreement and adjustment following PND (given the apparent lack of association between partner agreement and partner support in the originally proposed Model 3). In accordance with recommended practice (Cohen & Cohen, 1983; Holmbeck, 1997), multiple regression

analyses were used instead of SEM to test moderation effects with mainly continuous variables. Therefore, no latent variables were involved; separate analyses were performed for each of the three adjustment outcomes. To eliminate potential multicollinearity effects due to simultaneous analysis of main effects and interaction effects, the predictor and moderator variables (i.e., (log of) Time 1 partner agreement and (square root of) perceived partner support) were first centered before being entered into the regression analyses (Aiken & West, 1991; Holmbeck, 1997). For each analysis, the main effects of the (centered) predictor and proposed moderator variables were entered simultaneously in the first step, along with Time 1 levels of the particular adjustment outcome and any covariates as determined earlier. In the second step, the centered predictor x centered moderator interaction term was entered. The presence of a significant interaction effect would constitute evidence of a moderation effect (Aiken & West, 1991; Holmbeck, 1997).

The interaction of (log of) Time 1 partner agreement and (square root of) perceived partner support was not significant in the prediction of distress or marital adjustment at Time 3 ($p>.05$) but it was significant in the prediction of Time 3 well-being ($p<.05$). Specifically, the association between perceived partner support and subsequent well-being was stronger among women who had reported lower agreement with their partners prior to genetic counseling (Table 11; Figure 6). This was confirmed by post-hoc simple slope analyses. In accordance with the guidelines of Aiken and West (1991), significance tests were performed for the slope of the regression of Time 3 well-being on (square root of) perceived partner support at both high and low values of (log of) Time 1 partner agreement (i.e., one standard deviation above and below the mean, respectively). Results indicated a significant association between (square root of) perceived partner support and Time 3 well-being at low

($p<.05$), but not at high ($p>.05$) levels of (log of) Time 1 partner agreement (Table 12). In turn, simple effects analyses of mean subgroup differences revealed that when Time 1 partner agreement was low, Time 3 well-being was significantly higher for women reporting high perceived partner support than for women reporting low perceived partner support ($p<.05$). No such difference was found in cases of high Time 1 partner agreement ($p>.05$; Table 13). Given that the standard deviation for Time 3 well-being in the overall sample was 8.65, this signifies a difference of 1.2 standard deviations between the low agreement-low support subgroup ($\overline{X} = 87.11$) and the high agreement-high support subgroup ($\overline{X} = 97.57$; Table 13).

Discussion

The present study examined the role of the partner, and of various aspects of the couple relationship, in women's experience of prenatal genetic counseling and testing for advanced maternal age. Only women who decided to undergo a PND procedure (usually amniocentesis) following genetic counseling were included in the principal analyses, and the 56% rate of genetic test uptake was substantially lower than expected based on our clinic statistics from recent years. It was also somewhat lower than rates reported in the literature (Chervin et al., 1977; Marteau et al., 1992; Tercyak et al., 2001). One possible explanation for this is the recent proliferation of new screening options in Canada, including the Prenatest® (Canada NewsWire, 2002) and Integrated Prenatal Screening (IPS; G. Graham, personal communication, January 2004), which women may choose as a first step, and if the results suggest a low risk of abnormality they may decide not to proceed with a more invasive PND procedure. The Prenatest® became available to women attending our clinic shortly after the onset of data collection for this study, and IPS became available

approximately halfway through the study. Based on informal polling during the course of data collection, we are aware that approximately 14 (20%) of the participants who declined PND testing underwent the Prenatest® and a further 27 (38%) had IPS. Data from women who declined PND will constitute the focus of a separate, upcoming paper.

The first objective of the present study was to explore the reasons for attendance or non-attendance of partners at AMA genetic counseling. The majority (83%) of women were accompanied by their partners to the genetic counseling appointment; this rate was notably higher than that observed in a sample recruited from the same clinic two years earlier (Humphreys et al., 2003), though it is roughly comparable with the highest rates reported in the literature (Kenen, Smith, Watkins, & Zuber-Pittore, 2000). According to participants, the most important reason for attendance by their partners, both at genetic counseling and at the actual PND procedure, was their inclination as a couple to view PND as a shared experience (Table 4). This coincides with our previous finding that women who attended AMA genetic counseling with their partners were more likely than unaccompanied women to view PND testing as a joint decision to be made as a couple (Humphreys et al., 2003). Other commonly cited reasons for partner attendance were to provide women with emotional support and to assist them in reaching a decision about testing, findings that are supported by qualitative evidence in the literature (Browner & Preloran, 1999). It should be noted that 63% of participants indicated that their partner's desire to learn about prenatal testing options was an important reason for their attendance. This highlights the likelihood that at least some men attend prenatal genetic counseling not simply to provide support to the woman but due to their own need or desire to participate in the process.

The most commonly cited reason for non-attendance by the partner at either the genetic counseling or testing appointment was difficulty getting time off work (Table 5), which is consistent with past reports of work conflicts being the most common barrier to partner attendance at prenatal genetic counseling (Browner & Preloran, 1999; Kenen et al., 2000). In some cases, women indicated that they had attended genetic counseling alone because they were already quite certain about what decision they would make or because they viewed PND as their own personal decision, both of which clearly complement some of the above-stated motivations behind partner attendance.

The second main objective of this study was to investigate the contribution of five "relationship variables" to women's adjustment following PND counseling and testing. The following variables were hypothesized to correspond with lower levels of distress and higher levels of well-being and marital adjustment: (i) Time 1 partner agreement; (ii) Time 1 anticipated joint decision-making; (iii) perceived partner support; (iv) empathic responding; and (v) partner support seeking. We found that different relationship variables were associated with different measures of adjustment (i.e., distress, well-being, or marital adjustment), and that results differed depending on the time at which adjustment was assessed. In general, relationship variables appeared to contribute more significantly to women's adjustment during the waiting period for test results than later on, after normal results were known. This could be a function of the well-established tendency for distress to reach peak levels during the waiting period and to taper to prior levels after the receipt of normal test results (Chervin et al., 1977; Dixson et al., 1981; Evers-Kiebooms et al., 1988; Fava et al., 1982, 1983; Phipps & Zinn, 1986; Spencer & Cox, 1987; Tercyak et al., 2001).

The waiting period thus appears to be a particularly salient time for women during which their spousal relationships can play a role in their psychological and marital functioning.

With respect to *individual* adjustment outcomes, women who reported a less shared approach to PND decision-making appeared to be more prone to experiencing distress during the waiting period for test results (Table 7). It is possible that joint decision-making instills a greater sense of comfort and confidence in the ultimate decision that is reached, somewhat akin to the adage "two heads are better than one." In contrast, women who hold greater responsibility than their partners for reaching the final decision might feel a degree of resentment and burden that could weigh upon them as long as the outcome of their decision remains unknown. This would correspond with Dixson and colleagues' (1981) qualitative reports of the sense of burden experienced by some women who carried a disproportionate amount of the responsibility for the PND decision.

Relationship variables appeared to contribute to *dyadic* adjustment outcomes at both Time 2 and Time 3, suggesting that these variables hold relevance to the quality of the marital relationship throughout the PND testing experience. Specifically, satisfaction with partner support was the most important independent correlate of marital adjustment during the waiting period (Table 7). Six weeks later, following the receipt of normal test results, the most important variable contributing to variance in marital adjustment was pre-counseling partner agreement (Table 8). The latter finding is noteworthy as it suggests that the extent to which couples agree about various PND-related issues before even attending the genetic counseling appointment carries relatively long-term implications for their marital adjustment. This complements the finding of Snowden, Schott, Awalt, and Gillis-Knox (1988) that couple agreement about whether or not to become pregnant held a significant

correlation with marital adjustment several months later, immediately prior to delivery. It might be argued that couples' prior levels of marital adjustment could have accounted for their tendency toward greater agreement and thus to their more favorable marital outcome; however, multivariate analyses indicated that the link between PND-related partner agreement and later marital adjustment existed even after statistically controlling for earlier marital adjustment. Taken together, the above findings support previous literature that has reported positive implications of couple agreement (Kirchler & Wagner, 1987; Séguin, Potvin, St-Denis, & Loiselle, 1999; Snowden et al., 1988), shared decision-making (Houlihan, Jackson, & Rogers, 1990; Peterson, 1981; Walster, Walster, & Traupmann, 1978), and partner support (Alexander, Feeney, Hohaus, & Noller, 2001; Demyttenaere, Lenaerts, Nijs, & Van Assche, 1995; Tietjen & Bradley, 1985) in non-PND populations and extends it, at least in some cases, to the current context.

Relationship-focused coping is a relatively new construct to receive empirical attention in the literature, and it has been discussed from a few different perspectives (Coyne & Smith, 1991; DeLongis & O'Brien, 1990; O'Brien & DeLongis, 1997). The traditional approach to studying coping mechanisms has been highly individualistic, with minimal consideration of the social context; as such, important aspects of the process of adaptation to stressors or transitions have likely been overlooked, especially for transitions that carry strong personal significance for couples. The main component of relationship-focused coping that has been the focus of DeLongis and O'Brien's (1990) research is empathic responding. In the present study, we also viewed women's efforts to seek support from their partners as a relationship-focused coping strategy; the results of structural equation modeling (SEM) analyses lend preliminary support for this notion, given that both partner support

seeking and empathic responding loaded significantly on the latent Relationship-Focused Coping construct. It would be valuable for future research to explore the connection between these two interpersonal modes of coping in greater depth, and to replicate these findings in larger and different samples.

Our findings suggest that, relative to the other relationship variables investigated here, the two relationship-focused coping strategies have little to no bearing on the psychological and marital adjustment of AMA women. It is noteworthy that both variables demonstrated some significant bivariate correlations with adjustment outcomes (empathic responding more so at Time 2 and partner support seeking at Time 3), but that they did not contribute significantly to multiple regression analyses. This suggests that the association between relationship-focused coping and adjustment may be largely redundant with the contribution of the other predictor variables.

It is important to note that in addition to relationship variables, certain sociodemographic variables correlated significantly with adjustment outcomes. Although these associations were statistically controlled in multiple regression analyses, they provide additional insight into factors that could increase (or decrease) the likelihood of positive adjustment among AMA women. In particular, older women and women who are more knowledgeable about PND prior to genetic counseling may experience greater well-being, especially while awaiting their test results. In contrast, women who have ever been diagnosed with a psychiatric disorder (e.g., depression) appear to be prone to greater distress and lower well-being during the waiting period, and to lower marital adjustment after receiving normal test results. Such socio-emotional factors bear consideration by genetic counselors and other health professionals involved in prenatal care.

Finally, the present study sought to explore the more complex interplay between women's relational context and their adjustment following PND, by testing a series of proposed mediational models. An initial examination of zero-order correlations among the variables in the hypothesized models indicated insufficient rationale for conducting full mediational analyses for two of the models (Models 1 and 4 in Figure 1). Contrary to the theory generated by our previous research (Humphreys et al., 2003), women's pre-counseling levels of PND-related decisional conflict did not correlate significantly with their use of relationship-focused coping strategies during the waiting period for test results (as hypothesized in Figure 1, Model 1). This could reflect, in part, the non-equivalence of the relationship-focused coping construct assessed in the second study and the "partner attendance" variable analyzed in the first study. A more direct extension of our previous findings would have entailed the analysis of partner attendance as a mediating variable; however, the small proportion of non-attending partners in the current sample precluded this option.

Despite our initial impression that both partner agreement and joint decision-making imply a sense of cohesiveness within couples, the hypothesis that they could be considered two indicators of a single, more global "Unity" construct was not supported in the measurement model of SEM analyses. Results of this study suggest that although both of these variables are important to consider when investigating how couples navigate the PND counseling and testing process, they are best examined as two separate interpersonal constructs of relevance to women's individual and marital adjustment.

Results did not fully support the hypothesized mediating role of relationship-focused coping in the association between pre-counseling partner agreement and women's

adjustment following the receipt of normal test results (modified Model 2). When all three adjustment outcomes were examined together as a latent Adjustment construct, the direct link between partner agreement and adjustment emerged as the most salient, and relationship-focused coping was not a powerful mediator of this association. Perhaps, as noted in the multiple regression analyses described above, global adjustment following PND is better explained by other relationship variables (in this case partner agreement) than by relationship-focused coping. However, when a more specific outcome variable was examined – namely, psychological well-being - support for a mediation effect was obtained (Figure 3). That is, women reporting greater agreement with their partners about whether or not to have PND or about what they would do in the event of a positive test result were more inclined to turn to their partners for support or to communicate understanding of their partners' point of view, and this use of relationship-focused coping accounted for the pre-existing link between pre-counseling partner agreement and subsequent well-being. When women perceive their values and preferences as being understood and shared by their partners, they may feel it is safe to use their couple relationship as a coping resource. This finding is supported in part by the finding of Pearlin and McCall (1991) that couple agreement about a decision can promote support-seeking behaviour.

Evidence was obtained for an indirect effect in the modified Model 3, such that the degree to which women anticipated reaching the PND decision jointly with their partners was positively associated with the degree to which they felt satisfied with their partners' support during the waiting period for test results, which, in turn, was positively associated with their adjustment following the communication of test results (Figure 4). This is termed an indirect effect due to the lack of direct association between anticipated joint decision-

making and adjustment – that is, perceived partner support cannot be said to "explain" any such pre-existing link, but joint decision-making can be said to have indirect implications for women's adjustment insofar as it increases their satisfaction with the support they receive from their partners. This finding provides empirical support for the theory of Dixson et al. (1981) that a less balanced approach to PND decision-making can lead women to feel a lack of support from their partners and greater burden of responsibility for the final decision.

Unlike joint decision-making, the degree of partner agreement about PND was not found to correlate with women's perceptions of their partners' support. Instead of playing a mediating role in the association between partner agreement and subsequent adjustment outcomes, secondary analyses revealed a significant moderation effect of partner support. Specifically, the association between perceived partner support and subsequent well-being was significant among women who had reported lower agreement with their partners prior to genetic counseling, whereas it was not significant in cases of high pre-counseling agreement (Tables 12-13; Figure 6). This suggests that partner support is more important to women's well-being in cases of lower spousal agreement. This moderation effect coincides with previous literature that has described social support as a protective buffer against the negative effects of stress (Aaronson, 1989; Lepore, 1997; Séguin et al., 1995; Wheaton, 1985). There is some preliminary research to suggest that social support may be more likely to act as a moderator of stress outcomes when the stressor in question is relatively short-term in nature (Lepore et al., 1991). Partner disagreement about PND could be viewed as a short-lived source of stress that is most acute during the process of decision-making but is presumably less salient once the relevant decisions have been reached. We did find partner agreement about PND issues to increase after the test decision had been made.

Despite the fact that partner support did not play a mediating role in the present study, there was some evidence that its relation with adjustment outcomes can be mediated by other factors. Consistent with the conceptualization of social support as coping assistance (Lazarus & Folkman, 1984; Thoits, 1986), AMA women who felt more satisfied with the support they received from their partners while awaiting PND test results were significantly less likely to engage in avoidant coping strategies, and this lower use of avoidant coping was, in turn, associated with better adjustment outcomes following the receipt of normal test results (Figure 5). This mediation effect is similar to those reported by Manne and Glassman (2000) and Rudnicki, Graham, Habboushe, and Ross (2001) in their studies of cancer patients and non-AMA pregnant women, respectively, although both of those studies included only distress as an outcome variable, whereas we used a more multi-faceted adjustment construct. Similarly, Manne et al. (1999) found that avoidant coping mediated the relation between spousal criticism (a variant of low spousal support) and both negative and positive mood outcomes.

Our findings thus lend credence to the notion that partner support may lead women to feel a greater sense of agency or self-efficacy in the face of a stressful experience, which helps to prevent the use of less "adaptive" modes of coping (Cutrona & Troutman, 1986; Major et al., 1990; O'Brien & DeLongis, 1997). However, the parallel result was not found with respect to problem solving as mediator of the relation between partner support and adjustment (Figure 1, Model 4). Perceived partner support was not significantly correlated with problem-solving coping. In the context of prenatal genetic counseling and testing, therefore, avoidant coping appears to be the more salient mechanism through which partner support relates to subsequent adjustment. This could reflect the fact that avoidant coping

may be more common in situations viewed as beyond one's control. As in the case of awaiting genetic test results, when there is little constructive left to be done, avoidant strategies (e.g., focusing one's attention away from the stressor) may take precedence over problem-solving methods of coping (Lazarus & Folkman, 1984).

Some important clinical implications are suggested by the results of this study. The observed role of certain relationship variables in contributing to women's adjustment to the experience of prenatal genetic testing warrants the allocation of at least a portion of the genetic counseling session to the discussion of couple issues. There may be some corresponding logistic issues, however, given the increasing use of a group approach to genetic counseling; it is worth considering strategies for incorporating couple-based interventions within a larger group format. It would be beneficial to encourage women to communicate as openly as possible with their partners about the nature of the support they would find most helpful, given that their satisfaction with the support they receive from their partners will play an important role in their marital adjustment during the waiting period for test results. Moreover, their perceptions of support from their partners will have direct implications for how women cope with PND testing. In situations where genetic counselors suspect a considerable degree of conflict or dissatisfaction among couples, a referral for more intensive intervention may be warranted, particularly given evidence that relationship functioning and satisfaction with spousal support can be amenable to improvement during pregnancy through targeted interventions (Brown, 1986b; Chescheir & Cefalo, 1992).

Early in the genetic counseling session, it would be appropriate for genetic counselors to ask couples whether they have discussed PND-related issues and the upcoming decision prior to the session; although some counselors reportedly do this on a routine basis,

it is not yet widespread practice (Lafans, McCarthy Veach, & LeRoy, 2003). For couples who have not discussed these issues to any great extent beforehand, or for those who hold quite differing views about PND, the genetic counseling session provides an opportunity to encourage effective communication and to facilitate couple decision-making. Although couples should be encouraged to determine for themselves how they would like to divide the decision-making responsibility, efforts to elicit at least some input from each spouse during the session could help to assuage some of the distress that is often experienced during the waiting period for test results. A more balanced decision-making process will increase women's sense of support from their partners, which in turn increases the likelihood of positive adjustment outcomes. Furthermore, special attention should be paid to cases of marked disagreement between spouses, given the link to longer-term marital adjustment. The importance of targeting marital adjustment during pregnancy is particularly high in light of evidence that couples reporting dissatisfaction in their marriages during pregnancy often continue to be dissatisfied once they become parents (Belsky, Spanier, & Rovine, 1983; Cowan et al., 1985). Levels of partner agreement also have implications for women's use of relationship-focused coping strategies. Indeed, early interventions aimed at resolving conflict around issues of prenatal testing and abortion could promote well-being several weeks later by increasing spouses' propensity to respond empathically toward each other and to turn to each other for support.

A few limitations of this study should be noted. The mediation effects explored via SEM analyses were limited to some extent by the relatively small sample size. However, efforts were made to minimize the number of parameters to be estimated in each model by testing each proposed mediation effect separately, and there is support in the literature for

using SEM with samples of 100 individuals or fewer, provided the tested models are not overly complex (MacCallum & Austin, 2000; Loehlin, 1992). Moreoever, it is the Chi-square statistic that has generally been described as overly sensitive to small samples – that is, whereas a non-significant Chi-square suggests a good-fitting model, a disproportionate rate of significant outcomes has been noted in small samples (Hoyle, 1995; Tabachnick & Fidell, 1996). In all of the models tested here, the Chi-square statistic was non-significant, allowing for greater confidence in the findings.

Caution must also be taken in any interpretation of causality, particularly in the tested Model 5 (Figure 5). In this model, the proposed mediator (avoidant coping) and predictor (partner support) were both assessed at the same time point, whereas in all other tested models the predictor always preceded the mediator, which in turn preceded the outcome variable. For the significant effect found in Model 5, therefore, one must consider the possibility that the use of avoidant coping led women to feel less supported by their partners, rather than the other way around. Manne and colleagues (1999) faced the same issue in their study; they tested an alternative model in SEM, where partner support acted as mediator between coping and mood outcomes, and found it to be a poor fit to the data, in contrast with the well-fitting original model specifying coping as the mediator.

Another study limitation was the differing assessment formats (paper-pencil vs. telephone survey) at the first and subsequent time points. A check for equivalence, based on a small subsample, revealed that the format of survey administration did relate to two of the relationship variables examined. Although these format effects were statistically controlled in the main analyses, this was not a perfect solution, and it would have been preferable to

apply a consistent format across all three time points, such as mailed questionnaires with well-timed reminder phone calls.

Finally, it would have been valuable to obtain input directly from women's partners, rather than assessing the various relationship variables from the perspective of the women only. Although women's perceptions of their partners' support or of any conflicting views between them are likely to be more salient to their own psychological adjustment than are objective data or the partners' accounts, input from the expectant fathers would certainly open up important additional avenues for research. For example, an exciting and developing area of study is that of "dyadic coping" and of the impact of mismatches between spouses in the coping strategies they employ (DeLongis & O'Brien, 1990; Giunta & Compas, 1993; O'Brien & DeLongis, 1997; Revenson, 1994). An exploration of coping strategies that are geared toward influencing others, introduced by O'Brien and DeLongis (1997) as an interesting topic for future research, would be particularly relevant to the context of couple decision-making in PND. It would also be worthwhile for future studies to examine how conflict or disagreement between spouses is resolved, and what kinds of interventions would be most beneficial in the PND-specific context.

Aspects of the couple relationship appear to have potential to promote individual and marital adjustment in the experience of prenatal genetic testing for women of advanced maternal age. It would be worthwhile to focus greater empirical and clinical attention on these issues - both in AMA women and in those with other PND indications such as abnormal first-trimester screening results - so as to increase the likelihood of a smooth transition to parenthood among women and their partners.

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Table 1

Bivariate correlations among sociodemographic variables and adjustment outcomes

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Age	-.05	.06	.31**	.07	-.09	.02	-.27**	.24*	.06	-.10	.22*	.14	-.13	.15	-.01
2. Family income	--	-.10	-.17	-.09	.01	-.11	-.12	.08	.00	-.09	.13	-.11	-.17	.12	.20
3. Knowledge	--	--	.25*	-.15	-.10	-.03	.09	.30**	.09	.04	.31**	.18	.04	.33**	.19
4. Perceived risk	--	--	--	.20*	-.09	-.02	-.01	.33**	-.02	-.02	.20	.18	.12	.05	-.17
5. Parental status	--	--	--	--	-.07	.14	-.02	-.07	.03	.01	.02	.06	.11	-.07	-.12
6. Psychiatric history	--	--	--	--	--	.11	.14	-.15	-.11	.21*	-.18*	-.20*	.02	-.08	-.24**
7. Attitudes toward abortion	--	--	--	--	--	--	.12	.05	.01	-.09	.10	.08	-.08	.09	.06
8. Distress (T1)	--	--	--	--	--	--	--	-.38***	-.13	.62***	-.39***	-.14	.58***	-.31**	-.26*
9. Well-being (T1)	--	--	--	--	--	--	--	--	.12	-.32**	.70***	.20	-.29**	.67***	.24*
10. Marital adjustment (T1)	--	--	--	--	--	--	--	--	--	-.20	.14	.38***	.05	.04	.38***
11. Distress (T2)	--	--	--	--	--	--	--	--	--	--	-.38***	-.26*	.52***	-.36***	-.18
12. Well-being (T2)	--	--	--	--	--	--	--	--	--	--	--	.26*	-.31**	.76***	.36***
13. Marital adjustment (T2)	--	--	--	--	--	--	--	--	--	--	--	--	-.02	.18	.45***
14. Distress (T3)	--	--	--	--	--	--	--	--	--	--	--	--	--	-.43***	-.26*
15. Well-being (T3)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.29**
16. Marital adjustment (T3)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Note. T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively. Variables 1-7 were assessed at Time 1.
*p<.05; **p<.01; ***p<.001.

Table 2

Comparison of women who received the mail-only vs. mixed format of survey administration on the basis of key Time 2 and Time 3 variables

Variable	Mail-Only Format (n=12)		Mixed Format (n=12[a])	
	$\bar{X}$	SD	$\bar{X}$	SD
Coping Strategies (T2)				
Problem-solving	28.25	5.89	31.33	7.51
Avoidant coping	17.58	7.12	20.33	6.70
Seeking support from partner[b]	24.67	4.77	23.75	6.30
Empathic responding	22.12	3.59	20.25	5.01
Partner Support (T2) [b*]	94.92	3.96	90.08	6.64
Adjustment Measures (T2)				
Distress	18.67	16.24	30.25	13.69
Well-being	94.92	8.72	89.75	5.54
Marital adjustment	28.17	3.01	26.08	2.15
Adjustment Measures (T3)				
Distress	18.83	11.38	24.80	12.18
Well-being	92.75	10.58	90.57	9.50
Marital adjustment*	27.58	3.50	24.81	2.38

Note. T2 & T3 = assessed at Time 2 and Time 3, respectively.
[a]Refers to the first 12 consecutive participants who received the measures in the mixed (mail/telephone) format. [b]Transformed versions of these variables were used to compute independent-samples t-tests; for ease of interpretation, however, the means and standard deviations displayed above are based on untransformed data.
*$p<.05$.

Table 3

Demographic characteristics of the sample: (a) continuous and (b) categorical variables

(a)

Variable	$\bar{X}$	SD
Age	37.24	2.04
Length of time with current partner (years)	8.82	5.90
Family income[a]	7.77	2.59
Hours worked/week	36.53	7.85
Education level[b]	4.67	1.26

(b)

Variable	No.	%
Marital status		
Married or common law	92	97
Have partner but not married/common law	3	3
Have any children	39	41
Ever had spontaneous abortion	21	22
Ever had therapeutic abortion	20	21
Language spoken most often at home		
English	77	81
French	8	8
Both	8	8
Other	2	2
Occupational status		
Employed	80	84
Homemaker	11	12
Other	4	4
Ethnic background[c]		
Caucasian	87	92
Other ethnic backgrounds	5	5

Note. [a]Responses are on an 11-point scale (1 = < $15,000; 7 [$\bar{X}$] = $90,000 – $104,999; 11 = $150,000+). [b]Responses are on an 8-point scale, representing highest level of education completed (1 = < high school; 4 [$\bar{X}$] = community college diploma or degree; 8 = post-doctoral training). [c]Three participants did not respond to the survey item about ethnic background.

Table 4

Women's ratings of the importance of various reasons for their partners' attendance at the genetic counseling and testing appointments

Reasons for Attendance	Genetic Counseling		PND Procedure	
	No.	%	No.	%
(a) To provide me with emotional support				
Not at all/minimally important	1	1	1	1
Somewhat important	40	51	21	24
Very important	38	48	66	75
(b) Because my partner wanted to learn about the various prenatal testing options				
Not at all/minimally important	2	3	n/a	n/a
Somewhat important	27	34	n/a	n/a
Very important	50	63	n/a	n/a
(c) Because my partner attends all of my medical appointments related to this pregnancy				
Not at all/minimally important	12	15	13	15
Somewhat important	38	48	46	52
Very important	29	37	29	33
(d) Because I wanted help in coming to a decision about prenatal testing				
Not at all/minimally important	3	4	n/a	n/a
Somewhat important	39	49	n/a	n/a
Very important	37	47	n/a	n/a
(e) Because we view prenatal genetic counseling/testing as a shared experience				
Not at all/minimally important	0	0	0	0
Somewhat important	16	20	23	26
Very important	63	80	65	74
Most important reason:				
(a)	14	18	42	48
(b)	9	11	n/a	n/a
(c)	1	1	1	1
(d)	9	11	n/a	n/a
(e)	45	57	44	50
Other reasons	1	1	1	1

Note. n/a = not asked; 79 (83%) of partners attended the genetic counseling session; 88 (93%) attended the PND procedure.

Table 5

Women's ratings of the importance of various reasons for their partners' non-attendance at the genetic counseling and testing appointments

Reasons for Non-Attendance	Genetic Counseling No.	Genetic Counseling %	PND Procedure No.	PND Procedure %
(a) Because it was difficult for my partner to get away from work to attend				
Not at all/minimally important	2	13	1	17
Somewhat important	1	6	0	0
Very important	13	81	6	83
(b) Because I did not feel a strong need for my partner to attend the appointment				
Not at all/minimally important	6	37	2	29
Somewhat important	7	44	3	43
Very important	3	19	2	29
(c) I was already quite sure what decision I would make about PND, so it did not seem necessary for my partner to attend				
Not at all/minimally important	6	37	n/a	n/a
Somewhat important	7	44	n/a	n/a
Very important	3	19	n/a	n/a
(d) Because I consider prenatal testing to be my own personal decision				
Not at all/minimally important	13	81	n/a	n/a
Somewhat important	2	13	n/a	n/a
Very important	1	6	n/a	n/a
(e) Because my partner did not want to come				
Not at all/minimally important	16	100	4	57
Somewhat important	0	0	3	43
Very important	0	0	0	0
Most important reason:				
(a)	10	62	5	71
(b)	2	13	2	29
(c)	1	6	n/a	n/a
(d)	0	0	n/a	n/a
(e)	0	0	0	0
Other reasons	3	19	0	0

Note. n/a = not asked; 79 (83%) of partners attended the genetic counseling session; 88 (93%) attended the PND procedure.

Table 6

Bivariate correlations among key study variables

	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Decisional conflict (T1)	-.54***	-.23*	-.30**	-.15	-.16	-.15	.30**	.14	-.37***	-.33**	.08	-.24*	-.28**
2. Partner agreement (T1)[a]	--	.16	.08	.25*	.18	.24*	-.20*	-.19	.24*	.14	-.11	.25*	.25*
3. Joint decision-making (T1)[a]	--	--	.28**	-.09	.17	.02	.11	-.29**	-.03	.19	.01	.01	.16
4. Partner support (T2)[a]	--	--	--	.30**	.36***	.11	-.29**	-.35***	.27**	.72***	-.16	.25*	.21*
5. Seeking support from partner (T2)[a]	--	--	--	--	.54***	.37***	-.06	-.07	.17	.20	-.02	.25*	.10
6. Empathic responding (T2)	--	--	--	--	--	.49***	.20*	-.22*	.11	.21*	-.03	.20	.06
7. Problem-solving (T2)	--	--	--	--	--	--	.01	.11	.02	-.05	-.04	.21*	.02
8. Avoidant coping (T2)	--	--	--	--	--	--	--	.47***	-.33**	-.24*	.41***	-.29**	-.16
9. Distress (T2)	--	--	--	--	--	--	--	--	-.38***	-.26*	.52***	-.36***	-.18
10. Well-being (T2)	--	--	--	--	--	--	--	--	--	.26*	-.31**	.76***	.36***
11. Marital adjustment (T2)	--	--	--	--	--	--	--	--	--	--	-.02	.18	.45***
12. Distress (T3)	--	--	--	--	--	--	--	--	--	--	--	-.43***	-.26*
13. Well-being (T3)	--	--	--	--	--	--	--	--	--	--	--	--	.29**
14. Marital adjustment (T3)	--	--	--	--	--	--	--	--	--	--	--	--	--

Note. T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively.

[a]Transformed versions of these variables were used; see text for details of data transformation.

*$p<.05$; **$p<.01$; ***$p<.001$.

Table 7

Multiple regression predicting Time 2 adjustment outcomes from relationship variables

Variables	B	SE B	β	t	sr^2	ΔR^2	F (cha)
Time 2 distress							
Step 1 (covariates)						.40	30.32***
Time 1 distress	.55	.07	.61	7.40***	.36		
Psychiatric history	5.00	3.84	.11	1.30	.01		
Step 2 (T1 relationship variables)						.07	6.06**
Partner agreement[a]	-7.58	5.41	-.11	-1.40	.01		
Joint decision-making[a]	-20.36	7.14	-.23	-2.85**	.05		
Step 3 (T2 relationship variables)						.02	1.26
Partner support[a]	-1.42	1.16	-.11	-1.22	.01		
Seeking support from partner[a]	2.45	2.16	.11	1.14	.01		
Empathic responding	-.61	.48	-.12	-1.27	.01		
Time 2 well-being							
Step 1 (covariates)						.51	22.92***
Time 1 well-being	.62	.08	.63	7.78***	.33		
Age	.22	.28	.06	.79	.00		
Knowledge about PND	.61	.45	.10	1.36	.01		
Psychiatric history	-1.96	1.56	-.10	-1.26	.01		
Step 2 (T1 relationship variables)						.02	1.47
Partner agreement[a]	3.97	2.35	.13	1.69	.02		
Joint decision-making[a]	-.34	3.05	-.01	-.11	.00		
Step 3 (T2 relationship variables)						.00	.18
Partner support[a]	.34	.52	.06	.65	.00		
Seeking support from partner[a]	.22	.94	.02	.24	.00		
Empathic responding	-.05	.21	-.02	-.23	.00		
Time 2 marital adjustment							
Step 1 (covariates)						.19	10.92***
Time 1 marital adjustment	.32	.09	.34	3.63***	.12		
Psychiatric history	-1.95	.81	-.23	-2.40*	.05		
Step 2 (T1 relationship variables)						.02	1.06
Partner agreement[a]	1.27	1.22	.10	1.04	.01		
Joint decision-making[a]	1.31	1.61	.08	.81	.01		
Step 3 (T2 relationship variables)						.36	23.46***
Partner support[a]	1.57	.20	.67	7.96***	.32		
Seeking support from partner[a]	-.16	.37	-.04	-.43	.00		
Empathic responding	-.01	.08	-.02	-.17	.00		

Note. B = unstandardized beta coefficient; SE B = standard error of the beta coefficient; β = standardized beta coefficient; t value is associated with the coefficient for each variable at entry; sr^2 = semipartial correlation (unique contribution of the predictor to R^2 within the set); sr^2 can also be viewed as a measure of effect size: small = .02, medium = .13, large = .26 (Cohen, 1992); ΔR^2 = change in R^2 at entry; F value is that associated with change in R^2 at entry.

[a]Transformed versions of these variables were used; see text for details of data transformation.

*p<.05; **p<.01; ***p<.001.

Table 8

Multiple regression predicting Time 3 adjustment outcomes from relationship variables

Variables	B	SE B	β	t	sr^2	ΔR^2	F (cha)
Time 3 distress							
Step 1 (covariates)						.33	46.64***
Time 1 distress	.48	.07	.58	6.83***	.33		
Step 2 (T1 relationship variables)						.01	.65
Partner agreement[a]	-5.16	5.37	-.08	-.96	.01		
Joint decision-making[a]	5.39	7.07	.07	.76	.00		
Step 3 (T2 relationship variables)						.01	.37
Partner support[a]	-.73	1.17	-.06	-.62	.00		
Seeking support from partner[a]	1.90	2.22	.09	.85	.00		
Empathic responding	.02	.50	.00	.04	.00		
Time 3 well-being							
Step 1 (covariates)						.47	40.85***
Time 1 well-being	.73	.09	.63	7.94***	.36		
Knowledge about PND	.94	.54	.14	1.73	.02		
Step 2 (T1 relationship variables)						.02	1.49
Partner agreement[a]	3.96	2.75	.11	1.44	.01		
Joint decision-making[a]	2.42	3.56	.05	.68	.00		
Step 3 (T2 relationship variables)						.02	1.10
Partner support[a]	.09	.59	.01	.15	.00		
Seeking support from partner[a]	1.34	1.10	.12	1.22	.01		
Empathic responding	.09	.25	.04	.36	.00		
Time 3 marital adjustment							
Step 1 (covariates)						.18	6.79***
Time 1 marital adjustment	.26	.08	.34	3.47**	.11		
Survey format	-.32	.73	-.04	-.44	.00		
Psychiatric history	-1.42	.68	-.20	-2.08*	.04		
Step 2 (T1 relationship variables)						.05	3.09*
Partner agreement[a]	2.39	1.00	.23	2.38*	.05		
Joint decision-making[a]	.37	1.31	.03	.28	.00		
Step 3 (T2 relationship variables)						.00	.07
Partner support[a]	.08	.22	.04	.37	.00		
Seeking support from partner[a]	.07	.41	.02	.18	.00		
Empathic responding	-.02	.09	-.03	-.23	.00		

Note. B = unstandardized beta coefficient; SE B = standard error of the beta coefficient; β = standardized beta coefficient; t value is associated with the coefficient for each variable at entry; sr^2 = semipartial correlation (unique contribution of the predictor to R^2 within the set); sr^2 can also be viewed as a measure of effect size: small = .02, medium = .13, large = .26 (Cohen, 1992); ΔR^2 = change in R^2 at entry; F value is that associated with change in R^2 at entry.

[a]Transformed versions of these variables were used; see text for details of data transformation.

*p<.05; **p<.01; ***p<.001.

Table 9

Goodness of fit measures for tested models

Model	df	χ^2	*p*	RMSEA	RMSEA Confidence Interval	CFI	GFI	AGFI
2 (initial modification)	7	5.43	.61	.00	.00-.11	1.00	.98	.94
2 (final model)	1	.017	.90	.00	.00-.12	1.00	1.00	1.00
3 (modified)	5	3.06	.69	.00	.00-.11	1.00	.99	.96
5	4	3.86	.42	.00	.00-.15	1.00	.98	.94

Note. Modifications refer to changes made to the original models proposed in Figure 1 (see text for details of modifications made to Models 2 and 3).

Table 10

Standardized parameter estimates for tested models

Variables		Standardized Parameter Estimates	
Independent	Dependent	Direct	Indirect
Model 2 (initial modification)			
T1 Partner Agreement	T2 Relationship-Focused Coping	.29*	--
	T3 Adjustment	.33*	.25*
T2 Relationship-Focused Coping	T3 Adjustment	.24	--
Model 2 (final model)			
T1 Partner Agreement	T2 Relationship-Focused Coping	.29*	--
	T3 Well-Being	.25*	.18
T2 Relationship-Focused Coping	T3 Well-Being	.25*	--
Model 3 (modified)			
T1 Joint Decision-Making	T2 Perceived Partner Support	.28**	--
T2 Perceived Partner Support	T3 Adjustment	.34**	--
Model 5			
T2 Perceived Partner Support	T2 Avoidant Coping	-.29**	--
	T3 Adjustment	.34**	.19
T2 Avoidant Coping	T3 Adjustment	-.48**	--

Note. Modifications refer to changes made to the original models proposed in Figure 1 (see text for details of modifications made to Models 2 and 3). T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively.
*$p<.05$; **$p<.01$.

Table 11

Multiple regression analyses to test for a moderation effect of partner support

Variables	B	SE B	β	t	sr^2	ΔR^2	F (cha)
Time 3 distress							
Step 1						.34	15.40***
Time 1 distress	.48	.07	.57	6.43***	.30		
Partner agreement (T1)[a†]	-4.48	5.37	-.07	-.84	.00		
Partner support (T2)[a†]	-.12	1.06	-.01	-.11	.00		
Step 2						.00	.05
Partner agreement[†] x Partner support[†]	-1.15	5.07	-.02	-.23	.00		
Time 3 well-being							
Step 1						.49	21.75***
Time 1 well-being	.69	.09	.60	7.33***	.30		
PND-related knowledge (T1)	.95	.55	.14	1.73	.02		
Partner agreement (T1)[a†]	4.12	2.70	.12	1.52	.01		
Partner support (T2)[a†]	.52	.52	.08	1.00	.00		
Step 2						.03	6.01*
Partner agreement[†] x Partner support[†]	6.24	2.54	.20	2.45*	.03		
Time 3 marital adjustment							
Step 1 (covariates)						.24	5.47***
Time 1 marital adjustment	.22	.08	.28	2.86**	.07		
Survey format	-.47	.74	-.06	-.64	.00		
Psychiatric history (T1)	-1.56	.70	-.22	-2.23*	.04		
Partner agreement (T1)[a†]	2.38	1.00	.23	2.39*	.05		
Partner support (T2)[a†]	.09	.20	.05	.46	.00		
Step 2						.00	.03
Partner agreement[†] x Partner support[†]	.16	.92	.02	.17	.00		

Note. T1 & T2 = assessed at Time 1 and Time 2, respectively; B = unstandardized beta coefficient; SE B = standard error of the beta coefficient; β = standardized beta coefficient; t value is associated with the coefficient for each variable at entry; sr^2 = semipartial correlation (unique variance in the criterion variable accounted for by the predictor at entry); sr^2 can also be viewed as a measure of effect size: small = .02, medium = .13, large = .26 (Cohen, 1992); ΔR^2 = change in R^2 at entry; F value is that associated with change in R^2 at entry.

[a]Transformed versions of these variables were used; see text for details of data transformation.

[†]Variables were centered prior to entry to avoid multicollinearity.

*p<.05; **p<.01; ***p<.001.

Table 12

Multiple regression to test the simple slope of Time 3 well-being and Time 2 partner support at high and low levels of Time 1 partner agreement

Variables	B	SE B	β	t
Low T1 partner agreement				
Time 1 well-being	.68	.09	.58	7.36***
PND-related knowledge (T1)	1.36	.56	.20	2.43*
Partner agreement below (T1)[a†]	4.18	2.63	.12	1.59
Partner support (T2)[a†]	2.45	.94	.37	**2.62****
Partner agreement below† x partner support†	6.24	2.54	.35	2.45*
High T1 partner agreement				
Time 1 well-being	.68	.09	.58	7.36***
PND-related knowledge (T1)	1.36	.56	.20	2.43*
Partner agreement above (T1)[a†]	4.18	2.63	.12	1.59
Partner support (T2)[a†]	.67	.70	.10	**.95**
Partner agreement above† x partner support†	6.24	2.54	.25	2.45*

Note. The variables "Partner agreement above" and "Partner agreement below" are derived by subtracting from the original agreement score the value of one standard deviation above or below the mean, respectively (see Aiken & West, 1991).
T1 & T2 = assessed at Time 1 and Time 2, respectively; B = unstandardized beta coefficient; SE B = standard error of the beta coefficient; β = standardized beta coefficient; t value is associated with the coefficient for each variable at entry.
[a]Transformed versions of these variables were used; see text for details of data transformation.
†Variables were centered prior to entry to avoid multicollinearity.
*p<.05; **p=.01; ***p<.001.

Table 13

Means (and standard deviations) of Time 3 well-being at high and low levels of Time 1 partner agreement and Time 2 partner support

	High Support	Low Support
High Agreement	97.57 (7.99)[a]	94.36 (7.56)[a]
Low Agreement	94.45 (6.04)[b]	87.11 (9.02)[b]

Note. [a]Difference not significant ($p>.05$). [b]Difference significant at $p<.05$.

Figure Captions

Figure 1. Hypothesized mediational models.

Figure 2. Longitudinal data collection procedures.

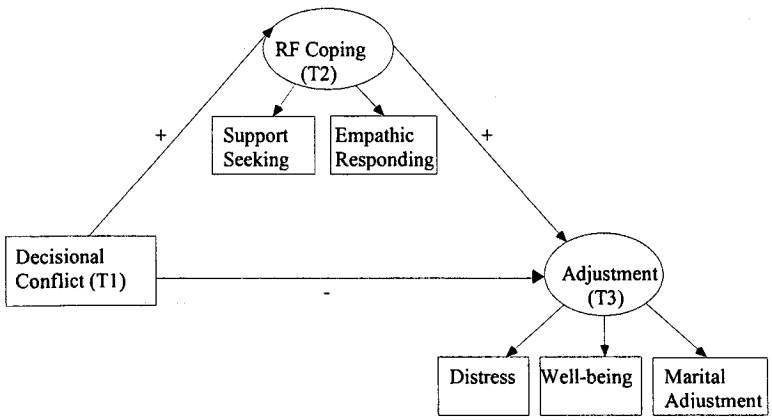
Figure 3. Full structural model of the mediation effect for associations between Time 1 partner agreement, Time 2 relationship-focused coping, and Time 3 well-being. All estimates are significant at the .05 level.

Figure 4. Full structural model of the indirect association between Time 1 anticipated joint decision-making and Time 3 adjustment through Time 2 perceived partner support. All estimates are significant at the .05 level.

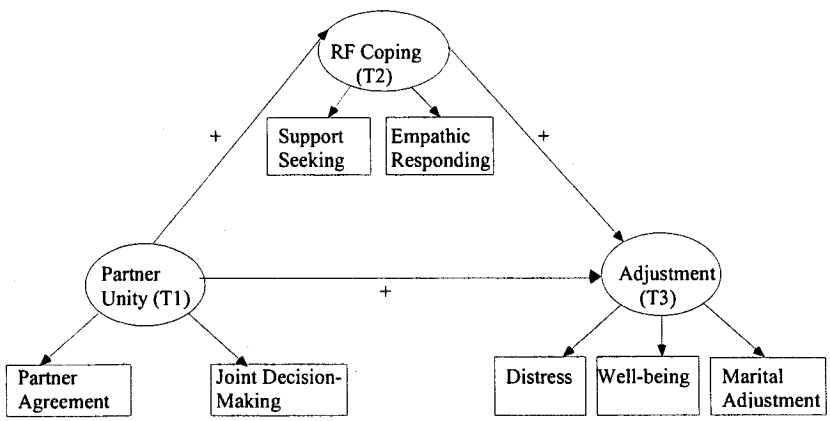
Figure 5. Full structural model of the mediation effect for associations between Time 2 perceived partner support, Time 2 avoidant coping, and Time 3 adjustment. All estimates are significant at the .05 level.

Figure 6. Psychological well-being as a function of the interaction between partner agreement and perceived partner support.

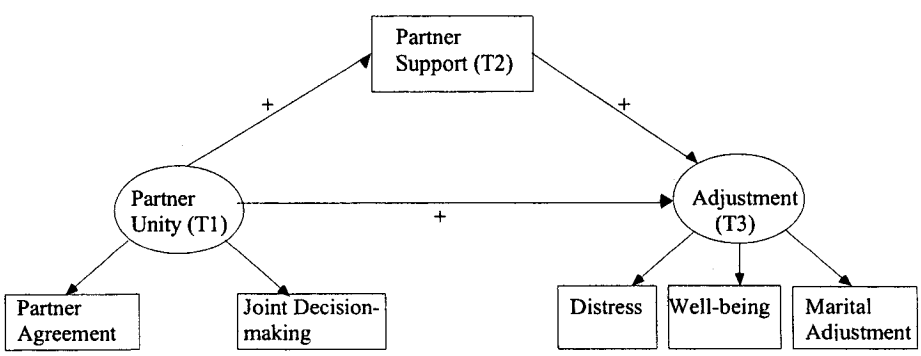
Model 1



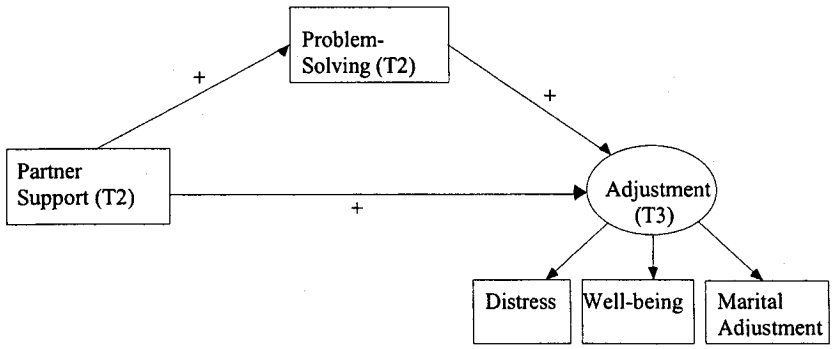
Model 2



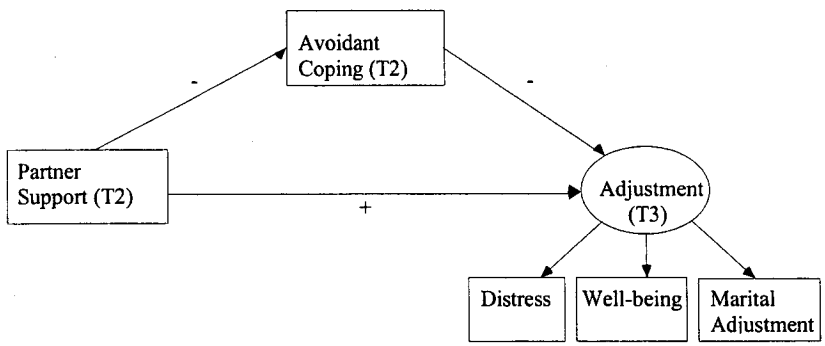
Model 3



Model 4

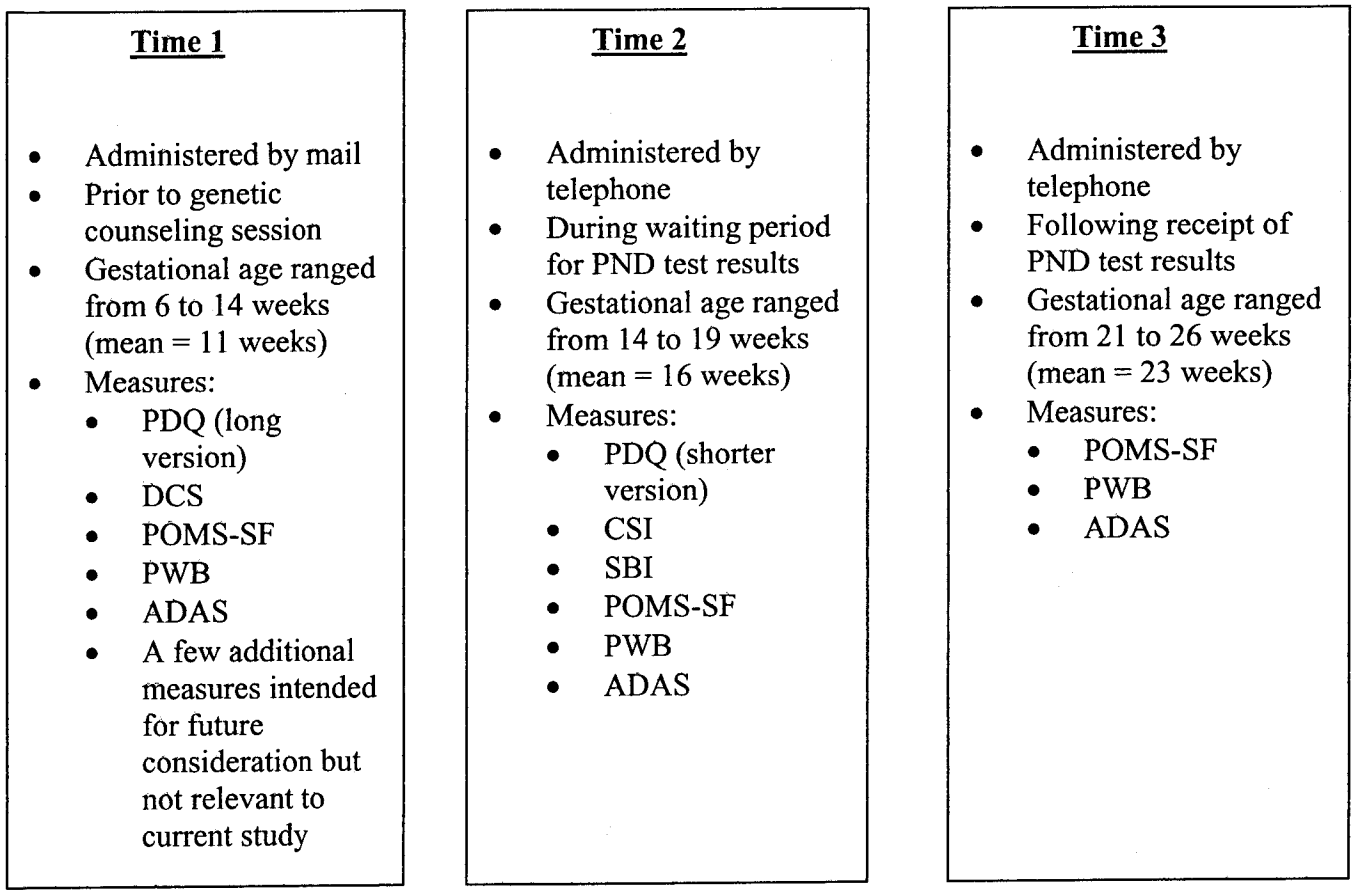


Model 5

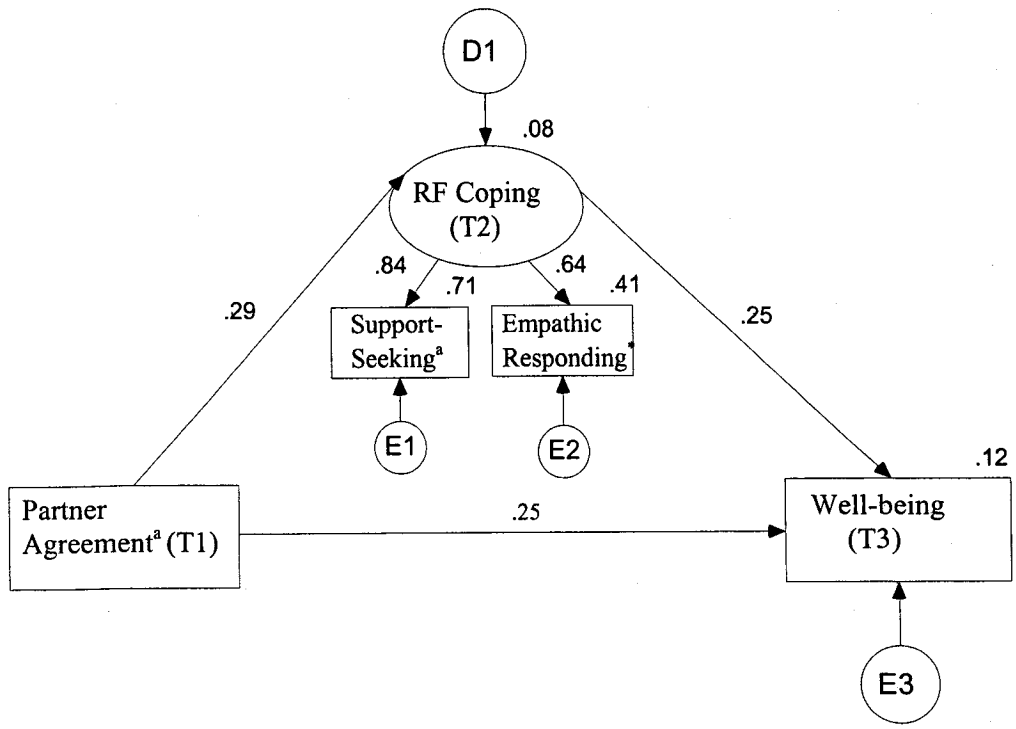


Note. T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively; RF Coping = Relationship-Focused Coping.

Figure 2



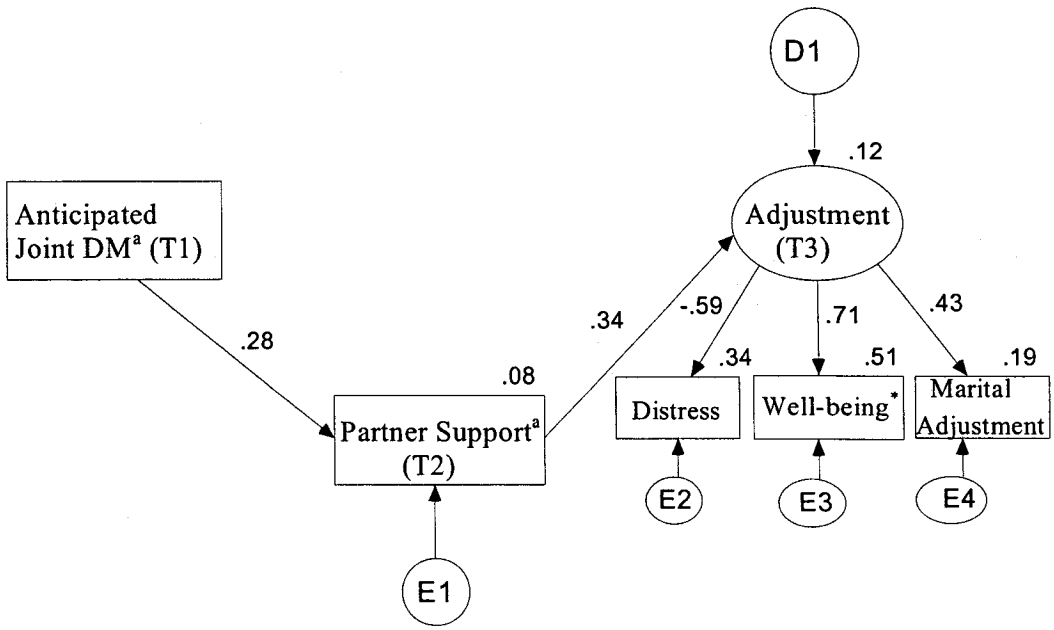
Note. PDQ = Prenatal Diagnosis Questionnaire; DCS = Decisional Conflict Scale; POMS-SF = Profile of Mood States – Short Form; PWB = Scales of Psychological Well-Being; ADAS = Abbreviated Dyadic Adjustment Scale; CSI = Coping Strategies Indicator; SBI = Support Behaviors Inventory.



Note. RF Coping = Relationship-Focused Coping; T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively; D1 = error term for endogenous latent variable; E1-E3 = error terms for endogenous observed variables.

[a]Transformed versions of these variables were used; see text for details of data transformation.

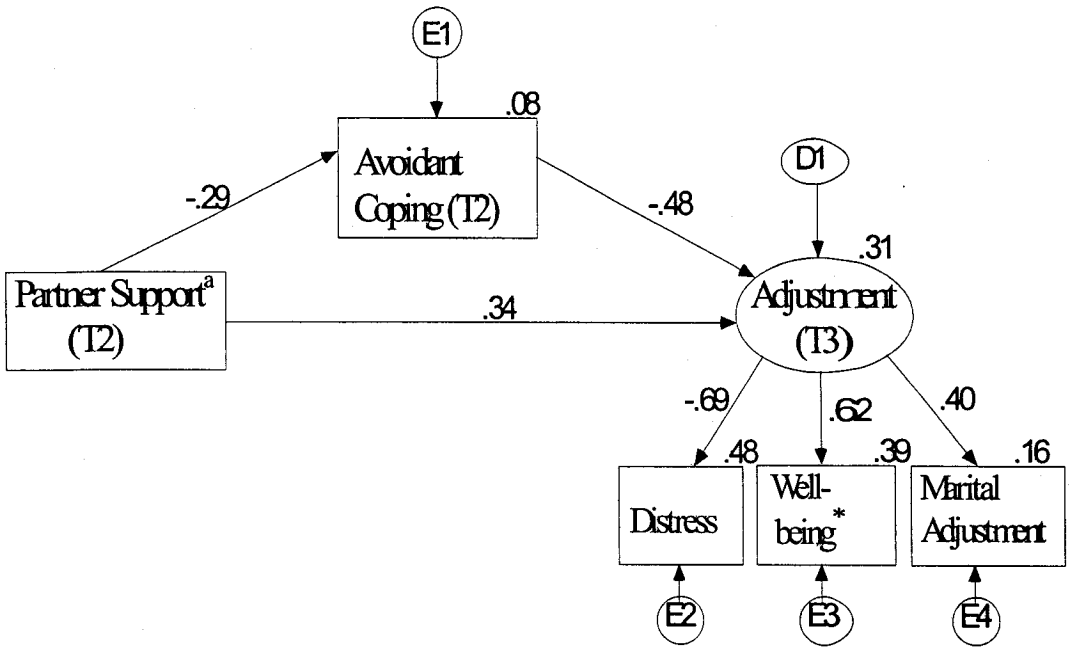
*parameter fixed to 1.0.



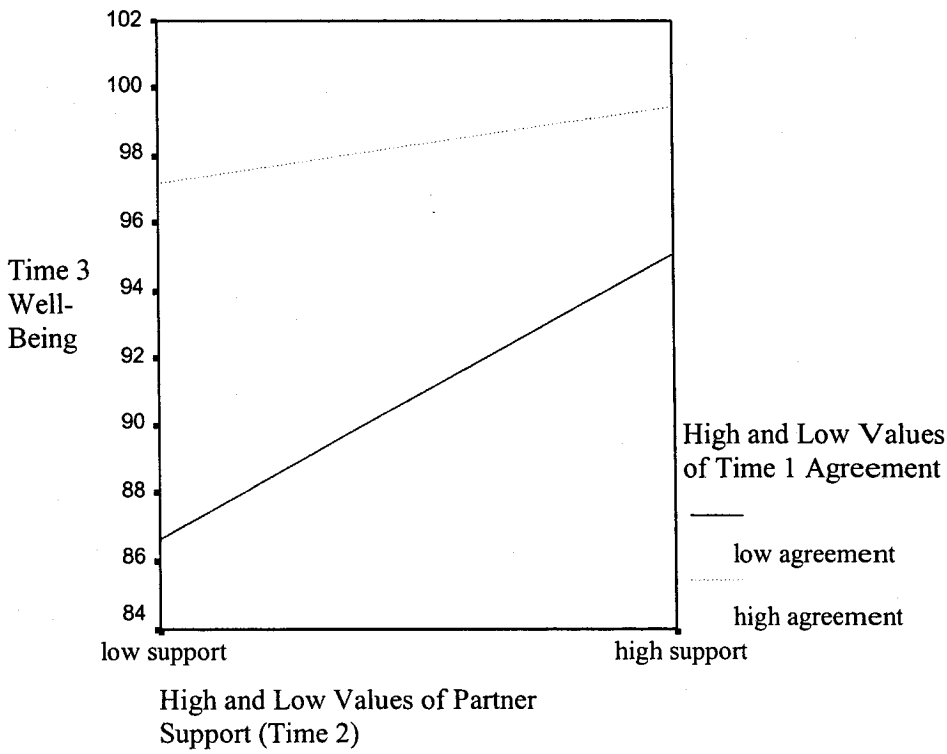
Note. Joint DM = Joint Decision-Making; T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively; D1 = error term for endogenous latent variable; E1-E4 = error terms for endogenous observed variables.

[a]Transformed versions of these variables were used; see text for details of data transformation.

*parameter fixed to 1.0.



Note. T1, T2, & T3 = assessed at Time 1, Time 2, and Time 3, respectively; D1 = error term for endogenous latent variable; E1-E4 = error terms for endogenous observed variables.
[a]Transformed version of this variable was used; see text for details of data transformation.
*parameter fixed to 1.0.


102
100
98
96
94
92
90
88
86
84
Time 3 Well-Being
low support
high support
High and Low Values of Partner Support (Time 2)
High and Low Values of Time 1 Agreement
low agreement
high agreement

GENERAL DISCUSSION

The major objective of this thesis was to explore how aspects of the couple relationship contribute to women's experience of prenatal genetic testing for advanced maternal age. This work was motivated by the marked lack of previous research examining the role of the partner, and of the relationship context in general, within a PND population. The interpersonal context is increasingly being highlighted in the literature as an important and historically neglected framework for understanding correlates of adjustment to significant life transitions (Bolger et al., 1989; O'Brien & DeLongis, 1997; Pagel et al., 1987; Schuster et al., 1990). Anecdotal evidence gleaned from earlier experience interviewing AMA women referred to the CHEO genetics clinic suggested that aspects of women's couple relationships, particularly disagreement about PND and about pregnancy termination, have the potential for strong associations with women's overall psychological adjustment.

To investigate these and other related issues in greater depth, two studies were undertaken with separate samples of women referred to the CHEO genetics clinic due to AMA. The goal of the first study was to better understand the role of the partner at the prenatal genetic counseling appointment by comparing women who attended the session alone with those who were accompanied by their partners, on the basis of several variables of interest. The second study sought to further elucidate the role of the partner in genetic counseling and to explore the contribution of various "relationship variables" (couple agreement, joint decision-making, partner support, and relationship-focused coping) to the prediction of women's individual and marital adjustment following PND. In addition, some

mediational models were tested with an aim to identify potential mechanisms through which the relationship context might influence women's adjustment to prenatal testing.

Summary of Salient Findings

The Role of the Partner at Genetic Counseling. Contrary to expectations, results of the first study indicated that women who attended their genetic counseling appointments alone reported no greater decisional conflict or state anxiety after the session, and no lower satisfaction with the genetic counseling intervention, than did women who were accompanied by their partners. In fact, it was the accompanied women who reported somewhat greater anxiety and decisional conflict, mainly prior to the genetic counseling session. This suggests that the presence of the partner could reflect a support-seeking coping strategy employed by women in response to feelings of anxiety and decisional uncertainty surrounding the issue of PND testing. Women who were feeling more conflicted about the decision may have wanted their partners with them in order to help them sort through the various options and reach a decision. This would seem to be an adaptive and positive response to indecision about PND. In contrast, women who were already quite certain as to what choice they would make may not have thought it necessary to bring their partners to the session. An alternate interpretation of these findings is that the presence of the partner might have contributed to increased anxiety and indecision among women. Either way, the results carry implications for genetic counselors, who instinctively may feel greater concern about women who attend AMA counseling alone, when in fact it is those who attend with their partners who may be having greater difficulty with the PND decision.

The theories and questions generated by the first study were addressed in the second study by directly asking women about the reasons behind their partners' attendance or non-

attendance at genetic counseling (and at the actual PND procedure). The most commonly cited reasons for partner attendance at genetic counseling were to provide women with emotional support, to assist them in reaching a decision about testing, and, of greatest importance, because they viewed prenatal genetic counseling as a shared experience. The latter finding corresponds with an additional result of the first study, namely that a significantly greater proportion of the accompanied women viewed PND testing as a joint decision, which suggests that couples who attend prenatal genetic counseling together have a tendency to view PND as a shared experience.

Commensurate with the above-noted motivations for partner attendance was the finding that some women who attended their appointments alone reported having done so because they were already quite certain about what decision they would make or because they viewed PND as their own personal decision. Taken together, this portion of the second study offers support for the main conclusions reached in the first study and lends less credence to the alternative interpretation that the presence of the partner might have contributed to greater anxiety and decisional conflict among women. It should be noted that the most important reason for the absence of partners at both the genetic counseling appointment and the PND procedure, according to the women in the second study, was difficulty in getting time off work to attend. This coincides with previous studies that have found work conflicts to be the most commonly stated reason for partner non-attendance (Browner & Preloran, 1999; Kenen et al., 2000). However, the present findings indicate that this is not the sole reason in all cases; the more systematic investigation conducted here uncovered additional motivating factors that are more intrinsic to the decision-making process.

The Contribution of Relationship Variables to Adjustment Outcomes. In general, the set of relationship variables assessed in the second study contributed more strongly to women's adjustment during the waiting period for PND test results than later on, after normal results were known. The waiting period thus appears to be a particularly salient time for women, during which their relationships with their partners can play a role in their psychological and marital functioning. Specifically, women's reported symptoms of distress, often shown to reach peak levels during the waiting period, were related to their reports of a less shared approach to PND decision-making. Women who held greater responsibility than their partners for reaching the final decision might have felt a degree of guilt or burden that could have weighed upon them as long as the outcome of their decision remained unknown. This would correspond with Dixson and colleagues' (1981) reports of the sense of burden experienced by some women who carried a disproportionate amount of the responsibility for the PND decision. In addition, satisfaction with partner support was an important and positive correlate of women's reported marital adjustment during the waiting period for test results, highlighting the salience of partner support in times of potential worry or uncertainty. This finding would seem to coincide with the above-noted importance of joint decision-making, in that women who perceive the process of decision-making as a shared experience would presumably perceive a greater degree of support from their partners in the process. Evidence for this link between joint decision-making and perceived partner support was indeed obtained in the subsequent mediation analyses described below.

In contrast to the findings obtained during the waiting period, none of the relationship variables yielded an independent association with women's levels of psychological distress or well-being at 23 weeks' gestation, once normal test results were received. Instead, the

longer-term implications of the relationship context were seen primarily in the realm of women's marital adjustment. The one relationship variable found to contribute significantly to later marital adjustment was partner agreement about PND-related issues. It is interesting to note that the effects of pre-counseling partner agreement appeared to lay "dormant" until a few months later, showing an independent association with marital adjustment only after the genetic counseling session, the PND procedure, and the communication of test results. It appears that despite learning that their test results were normal, the quality of women's relationships with their partners could still be partially explained by the extent to which they had agreed earlier with their partners about, among other things, whether or not to have testing in the first place. The longer-term marital implications of partner agreement in the PND context bear consideration by genetic counselors, the health professionals who have the potential to play an important role in facilitating couple decision-making through the reciprocal communication of individual perspectives and concerns. This issue is particularly important given that couples reporting dissatisfaction in their marriages during pregnancy often continue to be dissatisfied once they become parents (Belsky, Spanier, & Rovine, 1983; Cowan et al., 1985).

Mediation Analyses. The results of the first study led to the hypothesis that women experiencing greater PND-related decisional conflict prior to genetic counseling would be more likely to engage in relationship-focused coping strategies, which in turn would correlate with better individual and marital adjustment following prenatal testing. A full analysis of such a mediation effect was not performed due to the non-significant bivariate correlations found between decisional conflict and both of the relationship-focused coping strategies, namely partner support seeking and empathic responding. This likely reflects, in

part, the non-equivalence of the relationship-focused coping construct assessed in the second study and the "partner attendance" variable analyzed in the first study. Ideally, the presence of the partner at the genetic counseling session would have comprised a third indicator of relationship-focused coping in the second study, and it could even have been explored individually as a mediating variable. However, the disproportionate number of partners who attended the session in the second study precluded such analyses, as hundreds of participants would have been required to achieve sufficient power for differentiation between accompanied and unaccompanied women.

The constructs of PND-related partner agreement and joint decision-making were two of the central relationship variables explored in the second study, and it was hypothesized that both implied a sense of "unity" between partners in approaching the PND decision-making process. The measurement model of SEM analyses did not provide empirical support for this proposed link between agreement and decision-making. This corresponds with the finding that these two relationship variables consistently showed differing patterns of association with the other key study variables. For example, joint decision-making was more salient to adjustment during the waiting period for test results, whereas partner agreement was more strongly linked with later adjustment outcomes; furthermore, joint decision-making correlated more strongly with distress, whereas partner agreement correlated more strongly with marital adjustment. As noted above, a less joint approach to decision-making may have greater implications for women's experience of worry and uncertainty when their test results are not yet known, due to the burden of knowing the decision has been predominantly their own. Later on, after normal test results are known, women may feel a greater sense of closeness with their partners in reflecting

back on the entire experience and knowing that they had shared similar desires and intentions as their partners when facing the PND transition.

Further evidence of the discrepancy between partner agreement and joint decision-making was noted in the different intervening variables found to be of relevance in structural equation models involving agreement and joint decision-making as predictors. For example, relationship-focused coping was found to mediate the association between early partner agreement and women's later psychological well-being. That is, women reporting greater pre-counseling agreement with their partners about PND-related issues were more inclined to turn to their partners for support or to communicate understanding of their partners' point of view, and this use of relationship-focused coping was, in turn, associated with greater well-being after genetic test results were known. This would suggest that when women perceive their values and preferences as being understood and shared by their partners, they may feel it is safe to use their couple relationship as a coping resource. In contrast, the degree to which they share responsibility with their partners for the ultimate decision does not appear to relate to their use of relationship-focused coping. Instead, the variable found to intervene between joint decision-making and later adjustment was perceived partner support. Joint decision-making showed no direct link to post-testing adjustment; however, it held indirect implications for individual and marital adjustment in that women who reported a more shared approach to the PND decision felt more supported by their partners during the waiting period, and this sense of support was associated with greater overall adjustment once test results were known. Given the significant implications of partner support for women's adjustment during pregnancy, as seen both in the second study and in a substantial body of previous research (Alexander et al., 2001; Bernazzani et al., 1997; Demyttenaere et al., 1995;

Séguin et al., 1995; Séguin et al., 1999; Tietjen & Bradley, 1985), it is of great relevance to identify factors that could enhance women's satisfaction with their partners' support. The concept of joint decision-making is unique to situations in which couples face decisions of relevance to them both. In the context of PND decision-making, it appears that women feel more supported by their partners when they perceive the burden of responsibility for the final decision as being weighted relatively evenly between them and their partners.

Again, this link with perceived partner support was unique to joint decision-making and did not extend to partner agreement. Partner agreement was found to be quite independent of, and in fact to interact with, perceived partner support in the prediction of adjustment outcomes. This finding appears to uphold the independence perspective that is central to stress-buffering (i.e., moderating) models of social support (Eckenrode & Wethington, 1990; Lepore et al., 1991). Results of a secondary moderation analysis revealed that the association between perceived partner support and subsequent well-being was stronger among women who had reported lower agreement with their partners prior to genetic counseling, suggesting that partner support is more important to women's well-being in cases of lower spousal agreement. This moderation effect coincides with previous literature that has described social support as a protective buffer against the negative effects of stress (Aaronson, 1989; Lepore, 1997; Séguin et al., 1995; Wheaton, 1985). It is intriguing to find that this buffering effect can also exist in the present context, where the source of support also plays a key role in the stressor itself (i.e., conflict or disagreement within the couple). This may in part be a function of the short-lived nature of the experience of PND decision-making and awaiting subsequent test results. There is some research to suggest that the moderating role of social support might be unique to transient, short-term

stress, and that it may serve a mediating function in the wake of more chronic stress, where the quality of social relationships is more prone to change – and deteriorate – over time (Lepore, 1997; Lepore et al., 1991).

The second study further revealed that the link between perceived partner support and adjustment outcomes is not always direct; in this case, evidence of a mediating role of avoidant coping was obtained. Women who felt more satisfied with the support they received from their partners while awaiting PND test results were significantly less likely to engage in avoidant coping strategies, and this lower use of avoidant coping was, in turn, associated with better adjustment outcomes following the receipt of normal test results. Consistent with previous research in non-PND populations (Manne & Glassman, 2000; Manne et al., 1999; Manne & Zautra, 1989; Rudnicki et al., 2001), this suggests that partner support may lead women to feel a greater sense of agency or self-efficacy in the face of PND counseling and decision-making, which helps to prevent the use of less "adaptive" modes of coping. Such a theory has been empirically tested and validated in non-AMA populations (Cutrona & Troutman, 1986; Major et al., 1990; Manne & Glassman, 2000; O'Brien & DeLongis, 1997). However, unlike previous research that has likewise found problem- or positive-focused coping to mediate the relation between partner support and adjustment (Manne et al., 1999; Manne & Zautra, 1989), no such effect was observed in the second study conducted here. This substantiates the notion that in the AMA population at least, problem solving and avoidant coping are relatively independent, distinct coping strategies rather than reflecting two extremes on a single continuum. Factor analytic studies of the Coping Strategies Indicator, the measure used in the second study, do provide clear evidence of orthogonality among the subscales (Amirkhan, 1990). Therefore, where partner support

diminishes avoidant coping, it does not necessarily follow that it should promote problem-solving coping.

The lack of a significant effect for problem solving could be a function of the nature of the stressor at hand. There may be less inclination toward a proactive approach to coping in the face of situations that are largely beyond one's control. While awaiting the results of genetic testing, there is arguably little constructive left to be done, and thus avoidant strategies may take precedence (Lazarus & Folkman, 1984). Nevertheless, the present findings confirm that even in situations that might lend themselves to a more avoidant approach to coping, such avoidance is not particularly adaptive, as it remains associated with more negative adjustment outcomes. This link between avoidant coping and poorer psychological adjustment has been reported in other samples of individuals awaiting diagnostic test results (Lutgendorf, Antoni, Ironson, & Klimas, 1997; Sweet, Savoie, & Lemyre, 1999; Wood-Warner, 1998).

Study Limitations

A number of limitations of this research have been discussed in the separate articles and will not be repeated below; however, one of the points put forth in the second study merits elaboration, and three additional limitations that were not mentioned in the articles also warrant attention here. First, although the discrepancies in scores on certain measures depending on the format of survey administration were statistically controlled in the relevant multivariate analyses, these format effects nevertheless serve to undermine, at least to some extent, the interpretation of longitudinal effects. Clearly, the most appropriate means of preventing this issue would be to use a consistent format across all time points, despite any

potential shortcomings associated with either the paper-pencil or the telephone administration options.

Beyond the associated practical inconvenience, the format effects observed in the second study represent an interesting finding in their own right, and one that generates some important empirical questions of relevance to survey research. The fact that, even in a very small sub-sample, women who gave responses by telephone reported significantly lower satisfaction with their partners' support during the waiting period and significantly lower marital adjustment following the receipt of test results, suggests that these effects are quite substantial. Women appear to be less inclined to describe negative aspects of their couple relationships when responding via a mailed questionnaire, whereas they are more critical when asked over the telephone. This raises questions as to which reports are the more "honest" indications of respondents' true feelings and what qualities of the corresponding survey format render this honesty more forthcoming. The longitudinal nature of the second study meant that the telephone interviewer developed a certain rapport with participants throughout the series of telephone calls, which may have led women to feel more comfortable and willing to describe the less satisfying aspects of their spousal relationships during pregnancy. The less personal paper-pencil format might have elicited a more guarded approach to responding, or, perhaps counter-intuitively, it might have been subject to greater social desirability bias. These are important conceptual issues that should be explored in greater depth in future research.

An additional limitation of the second study rests in the skewed distribution of scores on several of the relationship variables, especially partner agreement and joint decision-making, both scales that were designed for the present research. In general, there appears to

be a tendency for highly favourable responses to questions about the nature and quality of intimate relationships. M. A. Brown (personal communication, February 2001) noted this when administering early versions of the Support Behaviors Inventory and ameliorated the issue somewhat by increasing the number of response options at the "satisfied" end of the scale, thus increasing the variability in the responses. It would be worthwhile considering a similar approach in future studies of partner decision-making, as there may be more gradations in partner agreement and joint decision-making than the current measures were able to detect, and this greater variability could yield more observed associations with other key relationship variables or adjustment outcomes. Although the impact of skewness was attenuated through data transformation procedures, it is nevertheless important to consider the fact that skewness can reduce statistical power (Wilcox, 2003). It is therefore possible that some of the findings that approached significance in the second study would have emerged as significant had some of the predictor variables been less skewed. This is at least partially counteracted by the fact that the measures used in the second study were reliable (see Appendix C), a factor that can positively influence power (Wilcox, 2003).

It would also be interesting for future research to explore the finer nuances of such constructs as partner agreement in greater detail, as these could prove to be quite complex. For instance, in a qualitative study of couples' decisions to tell their children that they were conceived by donor insemination, Daniels, Lewis, and Gillett (1995) noted that agreement can signify a number of different things. It can reflect the fact that both partners are of like mind on the issue, or that one partner has accepted and deferred to the other's wishes, or that the partners acknowledge having different views but are willing to co-operate to achieve a satisfactory outcome, or that they agree on most points related to the issue but differ

markedly on some of the smaller details (Daniels et al., 1995). It would be interesting to explore how these various manifestations of "agreement" might differentially contribute to individual and/or marital adjustment in the context of PND or other situations involving couple decision-making.

Another limitation of the second study is that the use of the Abbreviated Dyadic Adjustment Scale (ADAS) as the main measure of marital adjustment could be challenged on the basis that one dimension of marital adjustment, namely interspousal agreement, is represented both in the ADAS and in one of the relationship variables intended to explain it. Although not strictly tautological (pregnancy/PND decision-making reflects a realm of agreement not included among the ADAS items), this could nevertheless raise questions about the scope of marital adjustment to which any observed empirical relationships would apply. To address this issue, the significant correlation between Time 1 partner agreement and Time 3 marital adjustment was re-examined after removal of the three spousal agreement items from the total Time 3 ADAS scores. The resulting bivariate correlation differed only marginally from the original ($\underline{r}$ = .23 vs. the original $\underline{r}$ = .25), and it remained statistically significant. This indicates that partner agreement about PND-related issues does relate significantly to dimensions of marital adjustment other than the couple's general tendency to agree about matters that arise between them.

Finally, an issue pertinent to both studies is that the results are limited primarily to Caucasian women of relatively high educational and socioeconomic status, who are in a relationship with a partner. Both samples reflect the general sociodemographic characteristics of clients who present to the CHEO genetics clinic for AMA counseling. However, as seen in Browner and Preloran's (1999) study of Mexican-American women,

findings regarding the degree of joint decision-making and the influence of male partners on amniocentesis decisions have the potential to differ quite notably in women from other sociocultural backgrounds. It is possible that greater variability in levels of partner agreement, perceived partner support, joint decision-making, and individual and marital adjustment would have been observed in a less affluent sample of women. Moreover, the experience of single women facing the PND decision-making process might contrast with that of the participants in the current studies. This would be a worthwhile avenue for future research.

Conclusions

The experience of prenatal genetic counseling and testing is an important life transition with significant personal relevance to both pregnant women and their partners. Although not usually a highly distressing experience overall, this transition requires women to examine their own reproductive values and concerns, along with those of their partners, and to navigate a series of decisions around which societal pressures and value judgments abound. Given the interpersonal (dyadic) dimension of pregnancy and of prenatal decision-making, the PND context was thought to provide an ideal opportunity to explore the potential importance of aspects of the couple relationship in facilitating women's individual and marital adjustment. Results of the second study suggest that the couple context does account for a sizable amount of the variance in adjustment during the actual transition; however, immediately after normal test results are known, the salience of the couple context is notably diminished. For women whose PND test results are normal, the communication of these results could be viewed as the conclusion of the PND experience. In contrast, if a chromosomal abnormality were detected, then the transition would extend into decisions

about whether to proceed with the pregnancy and/or how to prepare for raising a child with Down syndrome or a neural tube defect. It is possible that in such instances the couple relationship would continue to play a role - perhaps an even more salient role - in women's adjustment. The present research highlights the time-limited nature of the PND experience for the majority women, and the fact that partners can play a role in facilitating women's experience of this transition, at least in the short term when the outcome remains uncertain.

Partners appear to play a multi-faceted role in women's experience of prenatal genetic counseling and genetic testing. They act as a source of both emotional and decisional support, they contribute to the decision-making process, and they serve as a coping resource, usually facilitating women's adjustment to the experience. Some aspects of women's couple relationships appear to increase the likelihood of positive psychological outcomes following PND. Implications for women's individual and/or marital adjustment were shown to arise from the level of agreement with their partners about PND-related issues, the extent to which they approached PND as a joint decision with their partners, and their satisfaction with the support provided by their partners. The use of relationship-focused coping strategies (partner support seeking and empathic responding) appeared to be less important in contributing to adjustment outcomes for AMA women.

Given that developments in genomic research continue to generate new prenatal diagnostic techniques and thus a wider range of choices, the potential for women to experience internal and external pressures on their prenatal decisions is likely to rise in the coming decades. It is important to determine those factors that may facilitate women's adjustment to the PND experience; the present research suggests that the interpersonal context – specifically the couple context - holds some relevance in this regard. Genetic

counselors should be alerted to such couple-based issues as conflicting viewpoints, imbalanced decision-making, and perceived unsupportive behaviours, as any corresponding interventions could increase the likelihood of positive outcomes for women and for the quality of their intimate relationships.

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Appendix A

Measures administered in Study 1

PRENATAL DIAGNOSIS SURVEY

(Items pertinent to principal analyses of Study 1)

INTENTIONS REGARDING PRENATAL DIAGNOSIS

4. Do you plan on having prenatal diagnosis?

❒ Yes ❒ No ❒ Not Sure

PRENATAL DIAGNOSIS DECISION-MAKING

12. (a) The decision to have prenatal diagnosis will be made by myself.

1	2	3	4	5
Strongly agree	Agree	Neutral	Disagree	Strongly disagree

(b) The decision to have prenatal diagnosis will be made by spouse/partner.

1	2	3	4	5
Strongly agree	Agree	Neutral	Disagree	Strongly disagree

(c) The decision to have prenatal diagnosis will be a joint decision, made between myself and my spouse/partner.

1	2	3	4	5
Strongly agree	Agree	Neutral	Disagree	Strongly disagree

GENERAL INFORMATION - TELL US A BIT ABOUT YOURSELF

Please check (✓) the right box or fill in the blank line.

28. Date of birth: _____/_____/_____
month day year

29. What is your postal code? _____

30. What is the highest level of education that you are <u>completing</u> or have <u>completed</u>? *(check only <u>one</u> box)*

❒ Less than high school
❒ Completed high school
❒ Certificate/diploma
❒ Community college diploma or degree
❒ University Bachelors degree
❒ University Masters degree

- ❒ University Doctorate
- ❒ Post Doctoral Training

31. What language do you speak most often at home? *(check only one box)*

❒ English ❒ French ❒ Both
❒ Other _____

32. What is your religion? *(check only one box)*

❒ Roman Catholic ❒ Protestant ❒ Hindu
❒ Jewish ❒ Muslim ❒ No religious preference
❒ Other: _____

33. How often do you attend religious services? *(check only one box)*

❒ Never ❒ Less than once a year ❒ Once a year
❒ Several times a year ❒ Once a month ❒ Every week

34. What is your current marital status? *(check only one box)*

❒ Single ❒ Married or Common-law
❒ Separated ❒ Divorced ❒ Widowed

35. Which of the following best describes your living arrangement? *(check only one box)*

- ❒ Live alone
- ❒ Live with spouse, family or friends

36. (a) For all your live pregnancies please indicate the following information: (*check correct box and write year*)

	Sex		Year Born	Breast fed?		Currently Living With You?	
1.	❒ M	❒ F	19_____	❒ Yes	❒ No	❒ Yes	❒ No
2.	❒ M	❒ F	19_____	❒ Yes	❒ No	❒ Yes	❒ No
3.	❒ M	❒ F	19_____	❒ Yes	❒ No	❒ Yes	❒ No
4.	❒ M	❒ F	19_____	❒ Yes	❒ No	❒ Yes	❒ No
5.	❒ M	❒ F	19_____	❒ Yes	❒ No	❒ Yes	❒ No

(b) Have you had any miscarriages? ❒ Yes ❒ No How many? _____
(c) Have you had any stillbirths? ❒ Yes ❒ No How many? _____
(d) Have you had any abortions? ❒ Yes ❒ No How many? _____

37. Are you planning to have children in the next two years? *(check only one box)*

❒ YES ❒ NO ❒ UNCERTAIN

38. (a) What is your main occupation?

❒ Looking for work

❒ Student

❒ Retired

❒ Homemaker

❒ Self-employed

❒ Currently employed as:_____

❒ Other (please specify): _____

(b) Number of hours worked per week? _____

39. What is your **family** income per year? *(check only one box)*
(If married or common-law, state the combined income of you and your partner).

❒ Under $10,000
❒ $10,000 to 19,999
❒ $20,000 to 29,999
❒ $30,000 to 39,999
❒ $40,000 to 49,999
❒ $50,000 to 59,999
❒ $60,000 to 69,999
❒ $70,000 to 79,999
❒ $80,000 to 89,999
❒ $90,000 to 99,999
❒ $100,000 or above

KNOWLEDGE QUESTIONNAIRE

1. Ultrasound can be used to detect every kind of birth defect.

   ☐ True ☐ False

2. Amniocentesis can cause miscarriage in about 1 out of 250 women.

   ☐ True ☐ False

3. Amniocentesis is a test of the mother's blood which can detect Down syndrome.

   ☐ True ☐ False

4. The chance of having a baby with Down syndrome is higher the older the mother.

   ☐ True ☐ False

5. Open neural tube defects include spina bifida (an opening in the bones around the spinal cord) and anencephaly (missing much of the skull and brain).

   ☐ True ☐ False

6. All children born with Down syndrome have severe physical and mental disabilities which require life-long care in an institution.

   ☐ True ☐ False

7. If amniocentesis or chorionic villus sampling shows Down Syndrome, the only options are to have a baby with Down syndrome or to end the pregnancy.

   ☐ True ☐ False

8. The chance of having an open neural tube defect is higher the older the mother.

   ☐ True ☐ False

9. Chorionic villus sampling, CVS, can cause miscarriage in about 1 out of every 100 women.

   ☐ True ☐ False

10. Having Maternal Serum Screening (also called the triple screen) is routinely available for all pregnant women.

    ☐ True ☐ False

11. Maternal Serum Screening is a blood test done at around 16 weeks and is a way to determine the chance that the developing baby has Down syndrome, Trisomy 18 or an open neural tube defect.

    ☐ True ☐ False

12. If the results of the Maternal Serum Screen are abnormal something is usually wrong with the baby.

☐ True ☐ False

13. If Maternal Serum Screening is abnormal, further tests are needed to tell if anything is wrong.

☐ True ☐ False

14. About 3 out of every 100 babies are born with a birth defect, regardless of exposures in the pregnancy, mother's age or family history.

☐ True ☐ False

15. The risk of having a baby born with Down syndrome as a mother gets older is an added risk, on top of the background risk that every couple takes in every pregnancy.

☐ True ☐ False

16. Amniocentesis or CVS results can rule out major chromosome differences, but cannot guarantee that the baby will be perfectly healthy.

☐ True ☐ False

17. Chromosomes are found in each cell of the body and are passed on from parent to child. It is essential for normal development that the correct amount of chromosome material be present in the developing baby's cells.

☐ True ☐ False

18. Sometimes amniocentesis or CVS results detect a chromosome difference other than Down syndrome. If any chromosome differences are found, the results would be fully discussed with the woman and her partner.

☐ True ☐ False

19. Prenatal testing is a choice. A woman can decide not to have any tests and if she does want testing, She can decide which testing that she prefers.

☐ True ☐ False

Intervention Satisfaction Questionnaire

For the following questions please indicate your level of satisfaction, with 1 being a low level of satisfaction and 4 being a high level, by circling the appropriate answer.

1. Did the counselor/doctor explain your condition clearly?	1 low satisfaction	2	3	4 high satisfaction
2. Did the counselor/doctor meet your expectations of him/her?	1 low satisfaction	2	3	4 high satisfaction
3. Did the counselor/doctor reassure you?	1 low satisfaction	2	3	4 high satisfaction
4. Did the counselor/doctor listen to what you had to say?	1 low satisfaction	2	3	4 high satisfaction
5. Did the counselor/doctor show enough dedication in treating your problem?	1 low satisfaction	2	3	4 high satisfaction
6. Did the counselor/doctor understand what was really bothering you?	1 low satisfaction	2	3	4 high satisfaction
7. How would you rate the length of time you waited since you contacted the clinic and until your visit?	1 low satisfaction	2	3	4 high satisfaction
8. How would you rate the length of time you waited since your arrival at the clinic and until you entered the counselor's/doctor's office?	1 low satisfaction	2	3	4 high satisfaction
9. How satisfied are you with the treatment you got from the medical staff, besides from the counselor/doctor (i.e. the nurse, the secretary, etc.)?	1 low satisfaction	2	3	4 high satisfaction
10. In summary, how would you rate your overall satisfaction with the information received on prenatal diagnosis?	1 low satisfaction	2	3	4 high satisfaction
11. In summary, how would you rate your overall satisfaction with the <u>way</u> that the information on prenatal diagnosis was presented to you?	1 low satisfaction	2	3	4 high satisfaction

Follow-up telephone survey after 24 weeks gestation

For the following statements, please state whether you strongly agree (1), agree (2), neither agree nor disagree (3), disagree (4) or strongly disagree (5).

1) The information and preparation I received in my genetic counseling session, prior to deciding whether or not to have PND testing, was helpful in my decision-making.

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

2) Since making my decision about whether or not to have PND testing, I have had a lot of second thoughts (or often wondered about whether I made the correct decision).

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

If the patient DID NOT have prenatal diagnosis, please skip to question #6.

3) After having prenatal diagnosis and before receiving my results, I had a lot of second thoughts (or often wondered about whether I made the correct decision).

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

4) After receiving my PND test results I had a lot of second thoughts (or often wondered about whether I made the correct decision).

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

5) The information I was given in genetic counseling prepared me well for the experience of prenatal diagnosis.

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

6) I think I made the right decision for me with regard to prenatal diagnosis.

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

7) The approach to preparing for the possibility of prenatal diagnosis was effective and does not need to be changed.

1	2	3	4	5
Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree

Do you have other questions or comments?:_____

Appendix B

Measures administered in Study 2

PRENATAL DIAGNOSIS QUESTIONNAIRE
(Time 1 Version)

I. YOUR RISK AND PRENATAL DIAGNOSIS

1. a) Compared to most women your age, what do you believe is your chance of having a child with Down syndrome?

1	2	3	4	5
Much Lower	Somewhat Lower	The Same	Somewhat Higher	Much Higher

b) What do you believe your chance is of having a child with any kind of chromosomal abnormality?

1	2	3	4
No Chance	Small Chance	Moderate Chance	Strong Chance

c) Which of the following do you believe represents your chance of having a child with any chromosomal abnormality?

1	2	3	4	5
1 in 1000	1 in 500	1 in 100	1 in 50	1 in 10

2.a) Do you plan to have prenatal diagnosis?

□ Yes □ No □ Not Sure Yet

b) If you answered Yes to Question 2a), What kind of procedure do you plan to have? (check all that apply)

□ Amniocentesis □ CVS (chorionic villus sampling) □ MSS (maternal serum screening)
□ Unsure

3. If a test showed that you were carrying a child with a chromosomal abnormality (such as Down syndrome), would you consider terminating your pregnancy?

❒ I would not choose to terminate my pregnancy under any circumstances
❒ It is unlikely that I would consider terminating my pregnancy
❒ I don't know what I would do
❒ I would consider terminating my pregnancy
❒ I would terminate my pregnancy

II. KNOWLEDGE OF PRENATAL DIAGNOSIS

Please indicate whether you believe each of the following statements is true or false by checking the appropriate box.

4. Ultrasound can be used to detect every kind of birth defect.

□ True □ False

5. Amniocentesis is a test of the mother's blood that can detect Down syndrome.

☐ True ☐ False

6. The chances of having a baby with Down syndrome are higher as the mother gets older.

☐ True ☐ False

7. If amniocentesis or chorionic villus sampling (CVS) shows Down syndrome, the only options are to have a baby with Down's Syndrome or to end the pregnancy.

☐ True ☐ False

8. The chances of having an open neural tube defect are higher as the mother gets older.

☐ True ☐ False

9. Chorionic villus sampling (CVS) can cause miscarriage in about 1 out of every 100 women.

☐ True ☐ False

10. Maternal Serum Screening (also called the triple screen) is a routine procedure for all pregnant women.

☐ True ☐ False

11. If Maternal Serum Screening is abnormal, further tests are needed to tell if anything is wrong.

☐ True ☐ False

III. YOU AND YOUR PARTNER

12. Please indicate how you and your partner feel about prenatal testing by choosing from among the following options (please check **one** box for you and **one** for your partner):

You	Your partner
❒ I want prenatal testing	❒ My partner wants prenatal testing
❒ I do not want prenatal testing	❒ My partner does not want prenatal testing
❒ I am not sure yet	❒ My partner is not sure yet

13. Keeping in mind the options you checked in #12, please indicate the extent of your agreement (or disagreement) with your partner with respect to having prenatal testing.

❒ We do not agree at all ❒ We agree a little bit ❒ We agree a moderate amount ❒ We agree quite a bit ❒ We agree completely

❒ We have not yet discussed our views about prenatal testing.

14. To what extent do you and your partner agree about the following issues?

a. We agree on what we would do if a prenatal test revealed that I was carrying a child with a chromosomal abnormality (such as Down syndrome):

❒ We do not agree at all ❒ We agree a little bit ❒ We agree a moderate amount ❒ We agree quite a bit ❒ We agree completely

❒ We have not discussed it yet.

b. We agree on how we would feel about raising a child with Down syndrome or a neural tube defect:

❒ We do not agree at all ❒ We agree a little bit ❒ We agree a moderate amount ❒ We agree quite a bit ❒ We agree completely

❒ We have not discussed it yet.

15. How much involvement do you expect from your partner in terms of deciding *whether or not to have prenatal testing* (e.g., amniocentesis)?

❒ No involvement (It will be my decision alone to make)
❒ Moderate involvement (My partner will contribute somewhat to the decision, although the final choice will be mine)
❒ Substantial involvement (My partner will contribute a great deal to the decision, although the final choice will be mine)
❒ Complete involvement (This will be a completely joint decision made by both of us)
❒ I will contribute a great deal to the decision but the final choice will be my partner's.
❒ I will contribute somewhat to the decision but the final choice will be my partner's.
❒ It will be entirely my partner's decision to make.
❒ We have not discussed my partner's involvement.

16. If a test showed that you were carrying a child with a chromosomal abnormality (such as Down syndrome), how much involvement would you expect from your partner in terms of deciding *whether or not to terminate your pregnancy*?

❒ No involvement (It would be my decision alone to make)
❒ Moderate involvement (My partner would contribute somewhat to the decision, although the final choice would be mine)
❒ Substantial involvement (My partner would contribute a great deal to the decision, although the final choice would be mine)
❒ Complete involvement (It would be a completely joint decision made by both of us)
❒ I would contribute a great deal to the decision but the final choice would be my partner's.
❒ I would contribute somewhat to the decision but the final choice would be my partner's.
❒ It would be entirely my partner's decision to make.
❒ We have not discussed what my partner's involvement would be.

IV. GENERAL INFORMATION - TELL US A BIT ABOUT YOURSELF

17. Date of birth: _____/_____/_____
month day year

18. What is the highest level of education that you are <u>completing</u> or have <u>completed</u>? *(check <u>one</u>)*

❒ Less than high school
❒ Completed high school
❒ Certificate/diploma
❒ University Bachelors degree
❒ University Masters degree
❒ University Doctorate or Professional Degree

❒ Community college diploma or degree ❒ Post Doctoral Training

19. What language do you speak most often at home? *(check only one box)*

❒ English ❒ French ❒ Both

❒ Other _____

20. What is your religion? *(check only one box)*

❒ Roman Catholic ❒ Protestant ❒ Hindu

❒ Jewish ❒ Muslim ❒ No religious preference

❒ Other: _____

21. How often do you attend religious services? *(check only one box)*

❒ Never ❒ Less than once a year ❒ Once a year

❒ Several times a year ❒ Once a month ❒ Every week

22. a) What is your current marital status? *(check only one box)*

❒ Single ❒ Married or living with partner

❒ Separated ❒ Divorced ❒ Widowed

b) If you are currently in a relationship, how long have you been with your partner? _____

23. Which of the following best describes your living arrangement? *(check only one box)*

❒ Live alone

❒ Live with spouse, family or friends

24. (a) For all your live pregnancies please indicate the following information: (*check correct box and write year*)

	Sex	Year Born	Currently Living With You?
1.	❒ M ❒ F	_____	❒ Yes ❒ No
2.	❒ M ❒ F	_____	❒ Yes ❒ No
3.	❒ M ❒ F	_____	❒ Yes ❒ No
4.	❒ M ❒ F	_____	❒ Yes ❒ No
5.	❒ M ❒ F	_____	❒ Yes ❒ No

(b) Have you had any miscarriages? ❒ Yes ❒ No How many? _____

(c) Have you had any stillbirths? ❒ Yes ❒ No How many? _____

(d) Have you had any abortions? ❒ Yes ❒ No How many? _____

25. Have you ever been diagnosed with a psychiatric disorder of any kind?

❒ Yes ❒ No ❒ Don't know

26. Please check which of the following diagnoses, if any, you have received:

❒ Major Depression
❒ Dysthymia
❒ Bipolar Disorder
❒ Generalized Anxiety Disorder
❒ Panic Disorder
❒ Obsessive-Compulsive Disorder
❒ Bulimia or Anorexia Nervosa
❒ Alcohol or Substance Abuse
❒ Other (please specify): _____

27. (a) What is your main occupation?

❒ Looking for work
❒ Student
❒ Retired
❒ Homemaker
❒ Self-employed
❒ Currently employed as:_____
❒ Other (please specify): _____

(b) Number of hours worked per week? _____

28. What is your **family** income per year? *(check only one box)*
(If married or common-law, state the combined income of you and your partner).

❒ Under $15,000	❒ $60,000 to 74,999	❒ $120,000 to 134,999
❒ $15,000 to 29,999	❒ $75,000 to 89,999	❒ $135,000 to 149,999
❒ $30,000 to 44,999	❒ $90,000 to 104,999	❒ $150,000 or above
❒ $45,000 to 59,999	❒ $105,000 to 119,999	

29. What is your ethnic background?

❒ White (e.g., Europe)	❒ Filipino	❒ South Asian (e.g., India, Pakistan)
❒ Black	❒ Japanese	❒ South East Asian (e.g., Thailand)
❒ Latino/a (e.g., Mexico)	❒ Chinese	❒ Other
❒ Korean	❒ Native/Aboriginal People of North America	

30. (a) At the time of completing this questionnaire, how many weeks pregnant are you? _____

(b) When is your due date? _____

(c) Today's date is: _____

Time 2 – Prenatal Diagnosis Questionnaire (Phone Version)
Gestational Age: _____

1. *(If participant had amnio or CVS)* Have you received your amniocentesis (*or CVS*) results yet?

❒ Yes ❒ No

2. To what extent do you and your partner agree about the following issues?

a. We agree on what we would do if a prenatal test revealed that I was carrying a child with a chromosomal abnormality (such as Down syndrome):

❒ We do not agree at all ❒ We agree a little bit ❒ We agree a moderate amount ❒ We agree quite a bit ❒ We agree completely

❒ We have not discussed it yet.

b. We agree on how we would feel about raising a child with Down syndrome or a neural tube defect:

❒ We do not agree at all ❒ We agree a little bit ❒ We agree a moderate amount ❒ We agree quite a bit ❒ We agree completely

❒ We have not discussed it yet.

3. How involved has your partner been in the decision about whether or not to have prenatal testing (e.g., amniocentesis)?

❒ Not at all involved (I made the decision on my own)
❒ Moderately involved (My partner contributed somewhat to the decision, although the final choice was mine)
❒ Very involved (My partner contributed a great deal to the decision, although the final choice was mine)
❒ Completely involved (My partner and I contributed equally to the decision)
❒ I contributed a great deal to the decision, although the final choice was my partner's.
❒ I contributed somewhat to the decision, but the final choice was my partner's.
❒ It was entirely my partner's decision.

4. Did your partner come with you to your genetic counseling appointment at CHEO?

❒ Yes ❒ No

5. *(If yes to #4)* – Partners attend prenatal appointments for different reasons. Please indicate how important each of the following reasons was for your partner:

a. To provide me with emotional support

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

b. Because my partner wanted to learn about the various prenatal testing options.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

c. Because my partner attends all of my medical appointments related to this pregnancy.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

d. Because I wanted help in coming to a decision about prenatal testing.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

e. Because we view genetic counseling and the decision about prenatal testing as a shared experience.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

f. Any other reasons not mentioned above?

_____
_____
_____
_____
_____

g. Which of the above reasons was *most* important? (a-f) _____

6. *(If no to #4)* – Women come to prenatal appointments without their partners for different reasons. Please indicate how important each of the following reasons was for you:

a. Because it was difficult for my partner to get away from work at the time of the appointment.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

b. Because I did not feel a strong need for my partner to attend the appointment with me.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

c. Because I was already quite sure about what decision I would make regarding prenatal testing, so it did not seem necessary for my partner to attend.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

d. Because I consider prenatal testing to be my own personal decision.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

e. Because my partner did not want to come.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

f. Any other reasons not mentioned above?

_____
_____
_____
_____
_____

g. Which of the above reasons was *most* important? (a-f) _____

7. To what extent did you want your partner to come with you to your genetic counseling appointment?

❒ Not at all ❒ A little bit ❒ Neutral ❒ Quite a bit ❒ Very much

8. *(If participant had amnio or CVS)* Did your partner come with you to your amniocentesis (*or CVS*) appointment?

❒ Yes ❒ No

9. *(If yes to #8)* - Partners attend prenatal appointments for different reasons. Please indicate how important each of the following reasons was for your partner:

a. To provide me with emotional support

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

b. Because my partner attends all of my medical appointments related to this pregnancy.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

c. Because we view prenatal testing as a shared experience.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

d. Any other reasons not mentioned above?

_____
_____
_____
_____
_____

e. Which of the above reasons was *most* important? (a-d) _____

10. *(If no to #8)* – Women come to prenatal appointments without their partners for different reasons. Please indicate how important each of the following reasons was for you:

a. Because it was difficult for my partner to get away from work at the time of the appointment.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

b. Because I did not feel a strong need for my partner to attend the appointment with me.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

c. Because my partner did not want to come.

❒ Not at all important ❒ Minimally important ❒ Somewhat important ❒ Very important

d. Any other reasons not mentioned above?

_____
_____
_____
_____
_____

e. Which of the above reasons was *most* important? (a-d) _____

11. *(If participant had amnio or CVS)* To what extent did you want your partner to come with you to your amniocentesis (*or CVS*) appointment?

❒ Not at all ❒ A little bit ❒ Neutral ❒ Quite a bit ❒ Very much

Date: _____ Subject ID#: _____

O'Connor Decisional Conflict Scale

The following statements pertain to the decision about whether or not to have prenatal diagnosis. At this point in time you may not know yet what you will decide to do. Please respond to the following statements keeping in mind the choice you *think* you will make. It is okay if you decide to change your mind later; we would like to know your thoughts *right now*. Please show how strongly you agree or disagree with these comments by CIRCLING THE NUMBER from 1 to 5 that best shows how you feel about the decision.

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	This decision is hard for me to make.	1	2	3	4	5
2.	I'm unsure what to do in this decision.	1	2	3	4	5
3.	It's clear what choice is best for me.	1	2	3	4	5
4.	I'm aware of the choices I have for prenatal diagnosis.	1	2	3	4	5
5.	I feel I know the benefits of prenatal diagnosis.	1	2	3	4	5
6.	I feel I know the risks and side effects of prenatal diagnosis.	1	2	3	4	5
7.	I need more advice and information about the choices available to me.	1	2	3	4	5
8.	I know how important the benefits of prenatal diagnosis are to me in this decision.	1	2	3	4	5
9.	I know how important the risks and side effects of prenatal diagnosis are to me in this decision.	1	2	3	4	5
10.	It's hard to decide if the benefits are more important to me than the risks, or if the risks are more important than the benefits.	1	2	3	4	5
11.	I feel pressure from others in making this decision.	1	2	3	4	5
12.	I have the right amount of support from others in making this choice.	1	2	3	4	5
13.	I feel I have made an informed choice.	1	2	3	4	5
14.	My decision shows what is most important for me.	1	2	3	4	5
15.	I expect to stick with my decision.	1	2	3	4	5
16.	I am satisfied with my decision.	1	2	3	4	5

COPING STRATEGIES INDICATOR

We would like to know what you have been doing to cope with the experience of prenatal genetic counseling and deciding about testing. Please indicate to what extent you have used the following coping methods by checking the appropriate box for each item.

To what extent have you....	ALMOST ALWAYS	QUITE A BIT	MODERATELY	A LITTLE BIT	NOT AT ALL
1. Let your feelings out to your partner?	☐	☐	☐	☐	☐
2. Let your feelings out to a friend?	☐	☐	☐	☐	☐
3. Tried to understand your partner's concerns?	☐	☐	☐	☐	☐
4. Brainstormed all possible options before deciding what to do?	☐	☐	☐	☐	☐
5. Tried to distract yourself from thinking about it?	☐	☐	☐	☐	☐
6. Accepted support and understanding from your partner?	☐	☐	☐	☐	☐
7. Accepted support and understanding from someone else?	☐	☐	☐	☐	☐
8. Tried to experience what your partner was feeling?	☐	☐	☐	☐	☐
9. Did all you could to keep others from knowing your feelings?	☐	☐	☐	☐	☐
10. Talked to your partner about it because talking about it helped you to feel better?	☐	☐	☐	☐	☐
11. Talked to others about it because talking about it helped you to feel better?	☐	☐	☐	☐	☐
12. Weighed your options very carefully?	☐	☐	☐	☐	☐
13. Daydreamed about better times?	☐	☐	☐	☐	☐
14. Considered different ways of approaching the experience until you found one that felt right for you?	☐	☐	☐	☐	☐
15. Tried to see things from your partner's point of view?	☐	☐	☐	☐	☐
16. Confided your concerns to your partner?	☐	☐	☐	☐	☐
17. Confided your concerns to a friend or relative?	☐	☐	☐	☐	☐
18. Spent more time than usual alone?	☐	☐	☐	☐	☐

	ALMOST ALWAYS	QUITE A BIT	MODERATELY	A LITTLE BIT	NOT AT ALL
19. Talked to your partner about it because just talking about it helped you come up with ways of approaching the experience?	☐	☐	☐	☐	☐
20. Talked to other people about it because just talking about it helped you come up with ways of approaching the experience?	☐	☐	☐	☐	☐
21. Focused a lot of your attention on dealing with the experience?	☐	☐	☐	☐	☐
22. Watched television more than usual?	☐	☐	☐	☐	☐
23. Thought about what needed to be done to deal with the experience?	☐	☐	☐	☐	☐
24. Formed a plan of action in your mind?	☐	☐	☐	☐	☐
25. Felt sure and stood firmly by what you wanted?	☐	☐	☐	☐	☐
26. Avoided being with people in general?	☐	☐	☐	☐	☐
27. Tried to help your partner by listening to him?	☐	☐	☐	☐	☐
28. Buried yourself in a hobby or sports activity?	☐	☐	☐	☐	☐
29. Fantasized about how things could have been different?	☐	☐	☐	☐	☐
30. Went to your partner for advice to help you make your decision?	☐	☐	☐	☐	☐
31. Went to a friend for advice to help you make your decision?	☐	☐	☐	☐	☐
32. Tried to do things for your partner that would help him in this experience?	☐	☐	☐	☐	☐
33. Tried to come to a resolution of the issues in your own mind?	☐	☐	☐	☐	☐
34. Slept more than usual?	☐	☐	☐	☐	☐
35. Tried to figure out your partner's needs in this experience?	☐	☐	☐	☐	☐
36. Became absorbed in novels or movies?	☐	☐	☐	☐	☐
37. Wished that people would leave you alone?	☐	☐	☐	☐	☐
38. Tried to carefully work through the experience rather than acting on impulse?	☐	☐	☐	☐	☐

SUPPORT BEHAVIORS INVENTORY

We are interested in finding out the kinds of things that are helpful to expectant parents during pregnancy. Below is a list of different things people do for each other. Please indicate how satisfied you are with the amount your partner/spouse does each of these things for you by circling the appropriate number.

	DISSATISFIED	SOMEWHAT DISSATISFIED	PARTLY SATISFIED/ PARTLY DISSATISFIED	SOMEWHAT SATISFIED	SATISFIED	VERY SATISFIED
1. Spending time with someone who is also having (or who has had) the similar experience of pregnancy.	1	2	3	4	5	6
2. Helps get house and things ready for the baby.	1	2	3	4	5	6
3. Understands my concerns about the changes in our relationship and lifestyle the baby will bring.	1	2	3	4	5	6
4. Helps keep up my morale during this pregnancy.	1	2	3	4	5	6
5. Lets me know how important I am as a helpmate during this pregnancy.	1	2	3	4	5	6
6. Shows interest in this pregnancy and the baby.	1	2	3	4	5	6
7. Shares activities related to pregnancy (doctor visits, classes, etc.).	1	2	3	4	5	6
8. Shows interest in my daily activities and problems (other than those about pregnancy).	1	2	3	4	5	6
9. Helps me deal with my fears about the possibility of having an unhealthy or abnormal child.	1	2	3	4	5	6
10. Encourages me to take proper care of myself.	1	2	3	4	5	6
11. Spending time with someone who feels good about having a child.	1	2	3	4	5	6

	DISSATISFIED	SOMEWHAT DISSATISFIED	PARTLY SATISFIED/ PARTLY DISSATISFIED	SOMEWHAT SATISFIED	SATISFIED	VERY SATISFIED
12. Lets me know that, despite the hassles involved, the pregnancy is worth it.	1	2	3	4	5	6
13. Helps with chores, errands or work around the house during this pregnancy.	1	2	3	4	5	6
14. Gives me information about what to expect during pregnancy and/or parenthood.	1	2	3	4	5	6
15. Reassures me I will be a good parent for the new baby.	1	2	3	4	5	6
16. Helps me feel that we share this pregnancy together.	1	2	3	4	5	6
17. Reassures me that we can make it financially after the baby comes.	1	2	3	4	5	6
18. Tolerates my ups and downs and unusual behaviours.	1	2	3	4	5	6
19. Is patient and understanding about changes in our sex life during this pregnancy.	1	2	3	4	5	6
20. Helps me by allowing me to compare my thoughts and feelings about being a parent to theirs.	1	2	3	4	5	6
21. Helps me deal with my fears about the physical risks of pregnancy and delivery.	1	2	3	4	5	6
22. Gives me feedback on how I am doing with this pregnancy.	1	2	3	4	5	6
23. Reassures me that having a baby is a natural event and people "survive."	1	2	3	4	5	6

POMS-SF

Please indicate the degree to which each of the adjectives below describes how you have been feeling OVER THE PAST WEEK, including today.

	Not at All				**Extremely**
1. Unhappy	1	2	3	4	5
2. Lively	1	2	3	4	5
3. Confused	1	2	3	4	5
4. Tense	1	2	3	4	5
5. Angry	1	2	3	4	5
6. Worn-out	1	2	3	4	5
7. Sad	1	2	3	4	5
8. Active	1	2	3	4	5
9. Unable to concentrate	1	2	3	4	5
10. On edge	1	2	3	4	5
11. Peeved	1	2	3	4	5
12. Fatigued	1	2	3	4	5
13. Blue	1	2	3	4	5
14. Energetic	1	2	3	4	5
15. Bewildered	1	2	3	4	5
16. Uneasy	1	2	3	4	5
17. Annoyed	1	2	3	4	5
18. Exhausted	1	2	3	4	5
19. Hopeless	1	2	3	4	5

	Not at All				**Extremely**
20. Cheerful	1	2	3	4	5
21. Forgetful	1	2	3	4	5
22. Restless	1	2	3	4	5
23. Resentful	1	2	3	4	5
24. Weary	1	2	3	4	5
25. Discouraged	1	2	3	4	5
26. Full of pep	1	2	3	4	5
27. Uncertain about things	1	2	3	4	5
28. Nervous	1	2	3	4	5
29. Bitter	1	2	3	4	5
30. Bushed	1	2	3	4	5
31. Miserable	1	2	3	4	5
32. Vigorous	1	2	3	4	5
33. Anxious	1	2	3	4	5
34. Furious	1	2	3	4	5
35. Helpless	1	2	3	4	5
36. Worthless	1	2	3	4	5

Scales of Psychological Well-Being

The following questions deal with how you feel about yourself and your life. There are no right or wrong answers.

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
1. In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
2. When I look at the story of my life, I am pleased with how things have turned out.	1	2	3	4	5	6
3. Maintaining close relationships has been difficult and frustrating for me.	1	2	3	4	5	6
4. The demands of everyday life often get me down.	1	2	3	4	5	6
5. I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
6. I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
7. I think it is important to have new experiences that challenge how you think about yourself and the world.	1	2	3	4	5	6
8. I like most aspects of my personality.	1	2	3	4	5	6
9. I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
10. In many ways, I feel disappointed about my achievements in life.	1	2	3	4	5	6
11. People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6
12. I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
13. I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
14. Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
15. For me, life has been a continuous process of learning, changing, and growth.	1	2	3	4	5	6
16. I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
17. I gave up trying to make big improvements or changes in my life a long time ago.	1	2	3	4	5	6
18. I judge myself by what I think is important, not by what others think is important.	1	2	3	4	5	6

ADAS

1. Most people have disagreements in their relationships. Please indicate below the approximate extent of the agreement or disagreement between you and your partner for each of the following three items.

	Always Agree	Almost Always Agree	Occasionally Disagree	Frequently Disagree	Almost Always Disagree	Disagree
(a) Philosophy of life	5	4	3	2	1	0
(b) Aims, goals and things believed to be important	5	4	3	2	1	0
(c) Amount of time spent together	5	4	3	2	1	0

2. How often would you say the following events occur between you and your mate?

	Never	Less than Once a Month	Once or Twice a Month	Once or Twice a Week	Once a Day	More Often
(a) Have a stimulating exchange of ideas	0	1	2	3	4	5
(b) Calmly discuss something	0	1	2	3	4	5
(c) Work together on a project	0	1	2	3	4	5

3. The dots on the following line represent different degrees of happiness in your relationship. The middle point, "happy," represents the degree of happiness of most relationships. Please circle the dot which best describes the degree of happiness, all things considered, of your relationship.

0	1	2	3	4	5	6
Extremely Unhappy	Fairly Unhappy	A little Unhappy	Happy	Very Happy	Extremely Happy	Perfect

Appendix C

Table of internal consistency values obtained for Study 2 measures

Measure	Cronbach's Alpha		
	Time 1	Time 2	Time 3
Prenatal Diagnosis Questionnaire (PDQ)			
Partner agreement	.84	.85	n/a
Decisional Conflict Scale (DCS)	.89	n/a	n/a
Coping Strategies Indicator (CSI)			
Problem solving	n/a	.84	n/a
Avoidant coping	n/a	.84	n/a
Seeking support from partner	n/a	.87	n/a
Empathic responding	n/a	.80	n/a
Support Behaviors Inventory (SBI)	n/a	.92	n/a
Profile of Mood States - Short Form (POMS-SF)	.94	.94	.93
Scales of Psychological Well-Being (PWB)	.74	.76	.84
Abbreviated Dyadic Adjustment Scale (ADAS)	.66	.79	.72

Note. n/a = not administered.

Appendix D

Table of Means and Standard Deviations for Adjustment Measures at Each Time Point in Study 2

Adjustment Measure	$\overline{X}$	SD
Time 1		
POMS-SF total score*	33.57	18.45
PWB total score	92.81	7.53
ADAS total score	26.61	3.27
Time 2		
POMS-SF total score	29.42	16.77
PWB total score	93.64	7.50
ADAS total score	26.28	3.09
Time 3		
POMS-SF total score	26.60	15.34
PWB total score	92.80	8.84
ADAS total score	26.68	2.56

Note. POMS-SF = Profile of Mood States – Short Form; PWB = Scales of Psychological Well-Being; ADAS = Abbreviated Dyadic Adjustment Scale.

*Significant linear trend for POMS-SF total scores across the three time points ($p<.001$). No significant changes across time for PWB or ADAS scores ($p>.05$).

CONTRIBUTIONS OF COLLABORATORS

This thesis comprises two separate articles with the following authorship:

Study 1: Humphreys, L., Cappelli, M., Hunter, A. G. W., Allanson, J., & Zimak, A. (published August 2003). The first author was responsible for conceptualizing the study, conducting statistical analyses, and writing the manuscript. The remaining authors contributed primarily editorial comments and feedback on written drafts.

Study 2: Humphreys, L., Cappelli, M., Aronovitch, E., Allanson, J., & Hunter, A. G. W. (submitted for publication). The first author was responsible for conceptualizing the study, designing new survey items and subscales, overseeing data collection and scoring, entering data, conducting statistical analyses, and writing the manuscript. The remaining authors contributed primarily editorial comments and feedback on written drafts, with the exception of E. Aronovitch, who also contributed to data collection and scoring.