POSTPARTUM DEPRESSIVE SYMPTOMS: TESTING A DIATHESIS-STRESS MODEL

The Role of Cognitive Style, Infant-Related Stress, and Marital Adjustment and Support

by

LESLEY A. GRAFF

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOHPY

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ABSTRACT

The period surrounding the birth of a child often involves profound physical changes and psychological adjustment for the mother. These changes may precipitate affective disturbances which range from the 'maternity blues' to psychosis. Postpartum depression, conceptualized as the mid-range of affective disturbances, has been reported in 10 - 30% of women who have just had a child (cf. O'Hara & Zekoski, 1988). The etiological and maintenance factors associated with postpartum depression are poorly understood. While the empirical literature has consistently reported associations between postpartum depression and three psychosocial factors, cognitive style (e.g., Cutrona, 1983), infant temperament (e.g., Whiffen & Kimball, 1985), and marital support (e.g., Kumar & Robson, 1984), much of the work has been retrospective, based on small sample sizes, and has not incorporated these variables within a theoretical framework. As a consequence, the relative impact of these variables and the nature of the relationships among them (e.g., additive versus interactive) is unknown. In the current study, the aforementioned psychosocial factors were incorporated into a diathesis-stress model in order to predict postpartum depression symptoms. One hundred and seventy primiparous women, recruited from prenatal classes, completed a questionnaire package eight weeks prenatally and four months postnatally. The package included measures of depressogenic personality style - sociotropy and autonomy (e.g., Beck et al., 1983), infant temperament, and partner support and adjustment. Based on an interactional diathesis-stress model, the stress associated with caring for a difficult infant was predicted to be associated with higher levels of depressive symptoms among women with high levels of depressogenic cognitive style. Specifically, it was predicted that this interaction between sociotropy/autonomy and difficult infant temperament would be buffered by partner support.

Regression analyses supported the diathesis-stress model with the sociotropy but not the autonomy subtype. Further, while marital support and adjustment were related to the lower postpartum depression level, the former variable did not buffer the interaction between sociotropy and infant temperament. As expected, prenatal depression was the strongest predictor of postpartum depression level. However, contrary to expectation, more women were depressed during pregnancy than in the postpartum. Finally, a most interesting result was that women's satisfaction ratings of time away from the baby contributed significantly to lower levels of postpartum depression. The present results generally support the cognitive diathesis-stress model of depression, although the conceptual and measurement problems associated with the model are noted. The present findings also suggest that the focus on postpartum depression should be broadened to include the entire childbearing period, and that the prevention and treatment of depression in the postpartum will require a better understanding of those factors which can contribute to increasing the woman's satisfaction with time spent away from the baby.

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INTRODUCTION

The period surrounding the birth of a first child often involves profound psychological and somatic changes. Leung (1985) describes this time as a developmental crisis, in which the woman must mobilize her individual assets and extra resources to adjust to her new role as mother and cope with the psychological and physical changes. The ability of the new mother to adjust impacts not only on her, but also on the infant. Several researchers have found negative effects of postpartum disturbance on mother-infant interactions, and later infant development (e.g., Broussard & Hartner, 1970; Cogill, Caplan, Alexandra, Robson, & Kumar, 1986; Digdon & Gotlib, 1985; Field et al, 1985; Fleming, Ruble, Flett, & Shaul, 1986; Gotlib & Lee, 1990; Searle, 1987; Whiffen & Gotlib, 1989a; Wrate, Rooney, Thomas, & Cox, 1985). Responses following childbirth have been found to range from a temporary 'maternity blues' to severe psychosis. Postpartum depression (PPD), conceptualized in the mid-range of responses in terms of severity, is present in 10 - 30% of women who have just had a child (e.g., Pitt, 1968; Gordon & Gordon, 1959). Despite its relatively common occurrence, and the potentially serious consequences, postpartum disturbances have only recently been the focus of renewed empirical attention (Hopkins, Marcus, & Campbell, 1984). In the past decade, studies have begun to assess the type and severity of postpartum responses, prevalence rates, and etiological variables. Three psychosocial factors have been relatively consistently identified as contributing to the development and maintenance of postpartum depression: cognitive style (e.g., attributions, perceived maternal competence; Cutrona, 1983), infant-related stress (actual difficulty of infant care, discrepancy between expectations and actual difficulty of baby; Graff, Dyck, & Schallow, 1989; Whiffen & Kimball, 1985), and quality of the partner relationship

(e.g., Kumar & Robson, 1984). The particular aspects of these factors that are important, and the way in which they interact to impact on PPD are, as yet, unclear.

It appears that a diathesis-stress model can incorporate and integrate the cognitive, environmental stressor, and interpersonal factors that have been empirically identified as impacting on postpartum depression, in order to clarify their relative contribution to PPD. Further, the research in the recent general depression literature, showing interactions between depressogenic personality factors and theme congruent stressors (e.g., Hammens, Mark, Mayol, & deMayo, 1985; Robins, 1990), can be fruitfully applied to postpartum research to further our understanding of PPD. The following literature review is organized into three major sections. The first section elaborates on postpartum depression, differentiating it from the blues and psychosis, and includes a detailed description of symptoms, onset, duration, prevalence, and the status of epidemiological variables associated with PPD. Secondly, etiological factors for postpartum depression, broadly categorized as biochemical and psychosocial, are examined. In addition, this section describes major methodological and conceptual issues in PPD research. Finally, the diathesis-stress model is described in terms of its application to postpartum depression. Further, the relevance of the general depression vulnerability-stress research to PPD research is detailed.

Postpartum Disturbances

Three types of postpartum responses have been identified: maternity blues, nonpsychotic postpartum depression, and postpartum psychosis. They differ to some extent in symptomatology, as well as severity, duration, and prevalence parameters. The blues and psychosis will be described first to provide a context for the mid-range

disturbance known as postpartum depression.

Maternity Blues

The maternity blues, known variously as baby blues, transitory syndrome, or third, fifth or tenth day blues is the most common and least severe of the three types of postpartum disturbances. It is a transient, self-remitting mood alteration that typically occurs within the first ten days postpartum (Harris, 1981; Yalom, Lunde, Moos, & Hamburg, 1968). The blues tend to last one or two days, with the peak onset thought to be on the third or fifth day after childbirth (Kendell, Mackenzie, West, McGuire, & Cox, 1984; Pitt, 1973; Thirkettle & Knight, 1985). There may be a short-term impact on daily functioning (Affonso & Domino, 1984). Frequent and/or prolonged tearfulness is most characteristic of the blues (Cutrona, 1982; Yalom et al., 1968). Other symptoms include increased lability of mood, a heightened sense of anxiety, some cognitive confusion, and irritability (Kraus & Redman, 1986; Nott, Franklin, Armitage, & Gelder, 1976; Pitt, 1973; Thirkettle & Knight, 1985). The blues phenomenon is quite common, with prevalence estimates ranging from 50 - 80% (e.g., Harris, 1981; Morsbach & Gordon, 1984; Pitt, 1973; Yalom et al., 1968). Given that the majority of women apparently experience it, it seems reasonable to consider maternity blues as a normal aspect of postpartum adjustment, rather than as evidence of maladjustment or disorder (Leung, 1985). Some studies have documented the changes during pregnancy and the early postpartum period (e.g., Lips, 1985; Robin, 1962). While there is general agreement on the nature of the changes, the research is mainly descriptive, and little is known about baseline rates to distinguish abnormal from normal reactions (Hopkins, Marcus, & Campbell, 1984).

Biochemical explanations have been most commonly tested to account for the occurence of the baby blues. Nott et al. (1976) investigated the relationship between the sudden drop in progesterone and estrogen

levels in the first few days postpartum and maternity blues, in one of the only studies that directly measured hormone levels. They did not find strong evidence for such a relationship. However, they suggested that "if hormonal influences predominated at any stage it would be likely to be immediately after delivery, when hormone levels have changed so dramatically" (p. 383). Metz et al. (1983) assessed the influence of platelet a2-adrenoceptors in the development of the blues. The number of a2-adrenoceptors fell after childbirth, but at a slower rate than the fall in estrogen and progesterone, corresponding more closely to the onset of the blues. In addition, women who experienced maternity blues had a higher platelet a2-adrenoceptor capacity than those who did not report blues symptoms, suggesting a relationship, although not necessarily a causal one. Harris (1980) investigated the role of L-tryptophan in maternity blues, by administering it after delivery to determine if symptoms were reduced. He failed to support the hypothesis that low levels of tryptophan cause the blues. Finally, Wilson (1985) carried out studies assessing platelet MAO activity, serum prolactin, and B-endorphin/B-lipotrophin. He found close correlations between the specific mood variables of depression, irritability, anxiety, and tearfulness, and the biochemical variables that he tested, concluding that biochemical mediators were important in early postpartum disturbances. Thus, as can be seen, findings regarding the role of biochemical factors suggest that these may be important, although their mechanism of action is as yet unspecified.

In summary, maternity blues is a transient and self-remitting affective response that occurs within a few days of childbirth to a majority of new mothers. The evidence supports a heavy biochemical influence in the etiology of the blues.

Postpartum Psychosis

Postpartum psychosis is much rarer than than the blues, and it

involves more severe and long-lasting symptoms. Prevalence estimates suggest that it occurs at a rate of 2 per 1000 cases of childbirth (Dalton, 1980; Herzog & Detre, 1976). Onset is typically within two to three days postpartum (Meltzer & Kumar, 1985), although some cases may develop in the period up to six weeks post-delivery (Herzog & Detre, 1976; Protheroe, 1969). The psychosis is characterized by a thought disorder (Dalton, 1980), most commonly with depressive and manic features, and infrequently with schizophrenic symptoms (Muller, 1985).

Researchers have generally concluded that postpartum psychosis is not demonstrably different from nonpuerperal psychoses (Dean & Kendall, 1981; Herzog & Detre, 1976). Muller (1985) reviewed studies of psychosis associated with childbirth, and found that 65% of postpartum psychosis patients experienced subsequent episodes unrelated to the puerperium. Approximately 20% of the women who had a postpartum psychotic episode had a previous history of nonpuerperal psychosis (Protheroe, 1969). Descriptions of symptoms for psychoses following childbirth were similar to symptoms of psychoses independent of the puerperium (e.g., Dean & Kendall, 1981). One exception was noted by Herzog and Detre (1976), who reported qualitative differences in the delusional content of the depression (i.e., common themes reflected issues associated with childbirth). Finally, there is strong evidence that genetic factors and family history play a role in the occurrence of postpartum psychoses, similar to that of nonpuerperal psychoses (Protheroe, 1969; Thuwe, 1974).

In sum, postpartum psychosis is not unique in symptomatology to the postpartum, except in its timing. The similarity to nonpuerperal psychosis in prevalence, symptoms, and genetic factors suggests that childbirth may be a precipitating stressor for those already vulnerable to the development of a psychosis (Cutrona, 1982).

Postpartum Depression

Postpartum depression (PPD) is generally conceptualized in the mid-range of postpartum affective disturbance, both in terms of severity and longevity. At this point, however, there is no conclusive evidence for a continuum of postpartum disorders per se. In particular, the relationship between the blues and postpartum depression is equivocal. Although some researchers have suggested that the difference is simply one of severity (e.g., Affonso & Domino, 1984), the evidence for such a postition is not strong. Pitt (1968) found a slightly higher rate of blues experienced by those who were depressed postpartum than in the non-PPD group. Paykel, Emms, Fletcher, and Rassaby (1980) also reported an association between the occurrence of the blues and the development of postpartum depression. However, three additional studies did not find the blues to be predictive of PPD (Gard, Handley, Parsons, & Waldron, 1986; Kumar & Robson, 1984; Meares, Grimwade, & Wood, 1976). In addition, the high base rate for the blues (i.e., 50-80%) and the lower rate of postpartum depression (i.e., approximately 10-30%) suggest that any relationship between the two might be capitalizing on chance. Thus, it is unclear whether postpartum depression represents a failure to recover from the blues, or whether the two are distinct phenomena (Cutrona, 1982).

Symptoms. Depression in the puerperium is not simply a dysphoric or depressed mood. Women have reported feeling disabled by the symptoms, not just sad or 'down' (Handford, 1985). Although definitional criteria vary, PPD appears to be characterized by many of the symptoms found in classical depression, including fatigue, weight loss, anorexia, irritability, anxiety, depressed mood, mood changes, sleep disturbances, crying, and feelings of loss and guilt (e.g., Kerfoot & Buckwalter, 1981; Kumar & Robson, 1978; Nixon, 1985; Zare-Parsi & Hoffman, 1989). Some of the symptoms are more likely to reflect

normal changes in the postpartum, such as weight loss, and sleep and appetite disturbances. In addition, while there has not been a direct empirical comparison of postpartum and nonpostpartum depressive symptoms, researchers have suggested there are some qualitative differences. Pitt (1968), in a descriptive study of 305 women, found that depression following childbirth was characterized by unusually strong anxiety and irritability, did not typically involve early morning awakening or suicidal ideation, and rarely involved expression of hopelessness and despair. Guilt and feelings of inadequacy and inability to cope with the baby were common. Vandenbergh (1980) also noted thematic differences from nonpostpartum depression, in terms of content of depressive thoughts. He reported that PPD women frequently experienced self-derogatory feelings focused on a sense of incapacity to love enough, and often felt ambivalence toward the child. Searle (1987) reported that PPD symptoms vary in intensity from day to day, and that PPD tends to be reactive to circumstances. Postpartum depression is less visible than either the blues or psychosis, since it is frequently not reported by the woman (Kendall, 1985; Pitt, 1968; Vandenbergh, 1980). Perhaps new mothers feel pressured by expectations of others that this is a joyous event and happy period of life, and are therefore reluctant to seek help or draw attention to any adjustment difficulties.

Onset/Duration. Information regarding the time of onset and duration of postpartum depression is inconsistent, and somewhat limited, perhaps due to the different operational definitions and measurement periods used by researchers. While the majority of PPD studies assess depression between six and twelve weeks following childbirth, there is no consensus regarding the limits for onset, and assessment has varied from a few days postpartum to one year. O'Hara and Zekoski (1988) suggested that most researchers tend to assess PPD at the earliest time they believe women will become depressed, for pragmatic reasons. O'Hara, Neunaber, and Zekoski (1984) found onset to occur within the

first week following delivery for 50% of their depressive subjects, and up to six weeks postpartum for some episodes. Others have suggested onset is more common during or after the third week following childbirth (e.g., Brandon, 1982; Vandenbergh, 1980; Welburn, 1980). Bridge, Little, Hayworth, Dewhurst, and Priest (1985) reported that half of the depressed cases in their study did not become depressed until after the six week mark, and cautioned that a substantial number of women whose depressive symptoms develop later would be ignored by assessing PPD too early. Kumar and Robson (1984) concluded from their prospective study that the period of one to three months postpartum was the most likely time for symptoms to be manifested. They interviewed 119 primiparous mothers repeatedly during pregnancy and up to one year postpartum, with a follow up at four years. Fourteen of the 15 mothers who became depressed reported that symptoms began between four and six weeks after delivery. Their study provided useful data for duration of PPD as well. Kumar and Robson reported that depression persisted for half of their depressed cases until six months, and three women were still depressed one year later. Pitt (1968) reported symptoms persisting for 40% of his sample, and Bridge et al. (1985) found one-third of their subjects were still depressed at the one year mark. O'Hara et al. (1984) found a mean postpartum duration of three weeks. Hopkins, Marcus and Campbell (1984) suggested that the average duration of PPD may be six to eight weeks, although they acknowledged that symptoms can persist for much longer.

With the application of a prospective design to PPD research, some studies have reported subjects with an onset of depression during pregnancy that may continue through to the postpartum (e.g., Atkinson & Rickel, 1984; Elliot, Watson, & Brough, 1985; Gotlib, Whiffen, Mount, Milne, & Cordy, 1989; O'Hara, 1985). However, other studies have reported little overlap between those depressed in the ante- versus postpartum (e.g., Kumar & Robson, 1984; O'Hara, Rehm, & Campbell, 1983).

There has been little done to assess possible differences between those who become depressed prepartum and those whose onset is not until postpartum. Preliminary research suggests there are differences in demographic correlates, and thus there may be etiological differences as well (Beusching, Glasser, & Frate, 1986; Cutrona, 1983; Gotlib et al., 1989). At this point, it is not clear what the relationship is between depression beginning in pregnancy versus depression with a post-delivery onset.

Prevalence. The reported prevalence of postpartum depression has ranged from 7% (Dalton, 1971) to 30% (Gordon & Gordon, 1959). The disparity in rates in part reflects the variety of diagnostic criteria used, with the label depression being applied rather loosely (O'Hara, 1984). Dalton, for example, defined as depressed those who sought treatment (rate = 7%), whereas Gordon and Gordon operationalized PPD in terms of a single rating by a physician of "degree of emotional disturbance with which the patient reacted to the maternity experience" (rate = 30%; p. 1075). In more recent research, either standard self-report depression measures (e.g., Beck Depression Inventory - BDI) to assess symptoms or diagnostic criteria (e.g., RDC or DSM-IIIR) to assess syndrome have been most commonly used (O'Hara, 1984). Not surprisingly, there tends to be a higher rate of PPD reported when the standard self-report questionnaire measures versus the diagnostic interview strategies are used. Pitt's (1968) reported rate of 10.8%, based on self-report questionnaire, was revised in a reanalysis of the data to 19.7% (Neugebauer, 1983). Paykel et al. (1980) found 20% of their subjects met the cutoff criteria on the Raskin Three Area Depression Scale, Hayworth et al. (1980) reported a 22% rate of depression when using the Zung Self-Rating Scale, and the Beck Depression Inventory yielded estimates between 20-30% (Atkinson & Rickel, 1984; Gotlib et al., 1989). Based on this research, one could conclude that postpartum depression occurs for almost one-quarter of the women who give birth (Atkinson &

Rickel, 1983), yet this is clearly on overestimation of the prevalence of diagnosable (DSM-IIIR) depression.

Diagnostic criteria using standardized interview schedules such as the SADS (Schedule for Affective Disorders and Schizophrenia) are somewhat more rigorous than the symptom measures, requiring that multiple affective, cognitive, and somatic symptoms be present over a two week period (Hopkins, Marcus, & Campbell, 1984). On the basis of these criteria, PPD rates were estimated as half those indicated by the symptom measures. Cutrona (1983) reported that 8.2% of her subjects were diagnosed as depressed following childbirth, O'Hara et al. (1984) found 12% of their sample experienced a depressive syndrome, and Gotlib et al. (1989) diagnosed 6.8% as depressed postpartum, with only 3.4% of those as new-onset cases (i.e., nondepressed in pregnancy). Thus, a syndrome of depression appears to affect approximately 10% of women in the puerperium. While the rate is not as high as that indicated by symptom measures, the occurrence of PPD in even 10% of new mothers suggests that a substantial number of women are experiencing some functional impairment and distress in the puerperal period.

Epidemiology. Numerous demographic variables have been assessed for their relationship to postpartum depression. In particular, age of the mother, socioeconomic status, parity, obstetrical complications, and previous psychiatric history have been extensively investigated. Despite the empirical focus, however, results have either failed to support epidemiological patterns or have been inconsistent. With regard to the relation between depression and age, most studies have found no association (e.g., Braverman & Roux, 1978; Nott et al., 1976; Pitt, 1968), although one reported that older women were more likely to become depressed (Gordon & Gordon, 1959), and two studies found that depressed subjects were significantly younger than the nondepressed subjects (Hayworth et al., 1980; Paykel et al., 1980). Socioeconomic status has also not been shown to have any significant relationship with postpartum

depression (e.g., Handley, Dunn, Waldron, & Baker, 1980; Hayworth et al., 1980; Nott et al., 1976; Pitt, 1968). In fact, only two studies of 13 reviewed by O'Hara and Zekoski (1988) showed any evidence for an association between the two variables. Support for a relationship between number of children and risk of postpartum depression is also contradictory. Most studies have reported no relationship between parity and PPD (e.g., Braverman & Roux, 1978; Elliot, Watson, & Brough, 1985; Gennaro, 1988; Handley et al., 1980; Hayworth et al., 1980). As exceptions, Kendell, Rennie, Clarke, and Dean (1981) found a significant correlation for postpartum depression in primiparous mothers, and Tod (1964) found an association between PPD and multiparity. However, the latter result may simply reflect the high recurrence rate of PPD (Melges, 1968). Studies assessing the contribution of obstetrical complications and labor/delivery stress to risk of PPD have generally failed to support any relationship (Bradley, Ross, & Warnycka, 1983; Elliot, Anderson, Brough, Watson, Rugg, 1984; O'Hara, Rehm, & Campbell, 1983; Paykel et al., 1980; Pitt, 1968; Yalom et al., 1968).

Finally, results regarding previous psychiatric history as a risk factor have been mixed. Braverman and Roux (1978) reported that past history of depression or other psychiatric problems was not predictive of postpartum depression. Their conclusion was supported by several other researchers (e.g., Bridge et al., 1985; Dalton, 1971; Handford, 1985; Handley et al., 1980; Kumar & Robson, 1984; Pitt, 1968; Yalom et al., 1968). However, other studies have found a strong association between past history of depression and current postpartum depression (e.g., Beusching, Glasser, & Frate, 1986; Paykel et al., 1980; Tod, 1964). O'Hara, Neunaber, and Zekoski (1984) reported that depression history was a significant predictor of depressive syndrome but not depressive symptoms. It may be that previous psychiatric history increases the risk of more severe depression postpartum, but evidence does not yet support any contention that this variable is either

necessary or sufficient for PPD to occur.

In summary, postpartum depression is characterized by a range of symptoms, some of which are similar to nonpostpartum depression. PPD may persist for several months to a year, and will occur at a rate of approximately 10% or 25%, depending on whether depressive symptoms or syndrome are assessed. Epidemiological factors, including age, parity, and psychiatric history have not been consistently linked to postpartum depression.

Etiology of Postpartum Depression

Over the years, there has been some shifting in the thinking about etiology of postpartum depression. Early studies focused on physiological factors particular to the puerperium, and portrayed the depressed mother as neurotic and vulnerable to a pre-existing mental illness that was simply triggered by childbirth (Kerfoot & Buckwalter, 1981). More recent studies have considered a range of variables that can be categorized broadly as biochemical or psychosocial, and in the sections that follow, the major findings in these areas will be summarized. As will be seen, much of this research is characterized by contradictory results and tentative conclusions. Also, most of the work is not theoretically driven, and uses primarily associational methodology. Prospective research has become more common, however, and may compensate for some of the drawbacks of associational analyses.

Biochemical Factors

Biological variables have been hypothesized to impact on postpartum depressed women through some imbalance or dysfunction (Cutrona, 1982). Hormonal factors have been the most commonly assessed variables, since endocrine levels fluctuate widely in the puerperium. Specifically, the large drop of progesterone and estrogen following

childbirth was postulated to be linked to PPD (e.g., Dalton, 1980; Yalom et al., 1968). However, while many studies have investigated hormonal explanations for the maternity blues (as noted in an earlier section), few studies have assessed the association between hormonal factors and PPD. It has been argued that indirect evidence for an endocrine-depression relationship is provided by studies reporting an association between mood alterations and periods in the life cycle in which there are hormonal fluctuations (i.e., menstruation, menopause, pre/postpartum; Nixon, 1985). Other indirect support was suggested by Alder and Cox (1983), who found that mothers who continued to exclusively breast-feed or who were using oral contraceptives had a higher rate of postpartum depressive symptoms. While they did not measure prolactin and estrogen levels directly, they argued that mothers using the pill or breast-feeding were less likely to have normal hormonal levels. However, others have found no relationship between breast-feeding and symptoms of depression (e.g., Kumar & Robson, 1978). In addition, a study by Van der Meer, Loendersloot, and Van Loenen (1984) found that progesterone treatments did not improve postpartum depression symptoms. Still other studies have found that adoptive mothers also report a PPD experience (Handford, 1985; Kraus & Redman, 1986). The only study that directly measured level of hormones and relation between changes and depressive symptoms (up to six weeks postpartum) could find no clear pattern of significant differences between depression and level of prolactin, estrogen, or progesterone (Nott et al., 1976). Overall, while the influence of hormonal variables should not be entirely discounted, there does not appear to be consistent evidence for a causal role in postpartum depression. More studies are needed that directly measure hormonal levels and changes to assess the correspondence with standard measures of depressive symptoms and syndrome.

Other chemical variables that have been investigated in relation

to PPD include tryptophan, which is a precursor to the neurotransmitter, 5-hydroxytryptamine (5-HT; Handley et al., 1980) and non-esterified fatty acids (Gard, Handley, Parsons, & Waldron, 1986). A lack of tryptophan has been implicated in clinical depression (Hopkins et al., 1984). Handley et al. (1980) measured levels of tryptophan from the ante-natal period to six weeks postpartum, and assessed depressive symptoms at the same time, plus at a six month follow up. Tryptophan level was low near the end of pregnancy, rose quickly in the first two days post-delivery, and slowly returned to normal levels by the fourth or fifth day. Absence of the peaking in the first days was significantly related to reports of maternity blues and to complaints of depression in the following six months. However, it is unclear why a variable that returned to normal levels within the first week following childbirth would be related to depression occurring over the subsequent months. Gard et al. (1986) compared depressed and nondepressed groups on a number of biological variables, and found the only significant group difference was for non-esterified fatty acids, which did not decrease as rapidly in subjects who were later depressed. Halbriech and Endicott (1981) argued that a decreased level of endorphins may be involved in postpartum depression, since higher levels were related to euphoria, and research in other areas had established a link between endorphin action and development of dysphoric symptoms. They did not, however, provide any empirical evidence for such a relationship.

To conclude, the present status of biological factors in the etiology for postpartum depression is equivocal. There is currently little support for any substantial contribution of biochemical factors to the development of postpartum depression. Most research in the area has assessed maternity blues, rather than PPD, and for the latter, only symptoms and not syndrome have been measured. It would be premature to entirely rule out a biological contribution though, since there is a lack of research directly investigating the relationship between PPD and

biochemical factors rather than clear evidence of no relationship.

Psychosocial Factors

Psychological variables (e.g., personality, cognitive style), and social/environmental variables, such as stress and social support have all been examined in etiological research on postpartum depression. Most of the studies assessed depression based on nonstandard or standard symptom measures. A few studies also included diagnostic evaluations of depression, and findings for the latter definition of depression will also be highlighted.

Psychological Variables. The personality characteristics of anxiety, hostility, and external locus of control measured during pregnancy were all found to predict depression at six weeks postpartum (Bridge et al., 1985; Dalton, 1971; Hayworth et al., 1980; Little et al., 1982). Hostility level in the first trimester of pregnancy was the strongest overall predictor of PPD. The role of optimism and pessimism as moderating the development of PPD was investigated by Carver and Gaines (1987). They measured depression during pregnancy and in the third week postpartum, using the BDI. Optimism was found to be inversely correlated with depression following childbirth. That is, the more optimistic a disposition, the less likely one would become depressed. They suggested that optimism may help provide resistance against the development of depression.

Raphael-Leff (1985) conceptualized two mothering 'personalities' or orientations: facilitators and regulators. Facilitators adapt themselves to the baby's needs, and see mothering as promoting self-actualization, whereas regulators view mothering in terms of socializing the infant, and see the role as interchangeable with other individuals. She hypothesized that depression following childbirth was not related to childbirth per se, but to issues around becoming a mother. She suggested that self-esteem was regulated by different factors for the

two types of mothers, and thus postpartum depression would occur at different times and for different reasons, depending on the mothering orientation. In her study of 27 mothers categorized as facilitators or regulators, she found that the two types of mothers were differentially vulnerable to depression at different times in a two year period (e.g., first six weeks and after one year for regulators; developmental milestones like weaning for facilitators). In addition, factors such as employment were differentially related to depression, as hypothesized. Her study represents one of the few attempts to move from a general to a more context-specific measurement of relevant variables. While her approach could provide some clarity for the contradictory findings in the area of postpartum depression (e.g., inconsistencies for demographic variables, contradictions regarding onset and duration), the study was retrospective, and was based on too small a sample to draw any firm conclusions.

Dysfunctional attributional style and the role of causal attributions have also been investigated, based on the general depression theory of learned helplessness. Attributional style refers to the characteristic way that individuals perceive causes of events. When applied in the postpartum context, results were mixed. Cutrona (1983) and O'Hara, Rehm, and Campbell (1982) assessed depressive symptoms both ante- and postnatally, using 85 and 170 subjects, respectively. In Cutrona's study, attributional style measured in the prepartum period (using the Attributional Styles Questionnaire) predicted postpartum depression for those whose onset was exclusively following childbirth. For subjects who were depressed during pregnancy and the postpartum, a dysfunctional attributional style was not predictive. O'Hara, Rehm, and Campbell (1982) also found that attributional style was a significant predictor of PPD. However, O'Hara, Neunaber, and Zekoski (1984), who measured both symptoms of depression (BDI) and syndrome of depression (SADS) at several periods

during pregnancy and the postpartum did not find a significant relationship between scores on the Attributional Styles Questionnaire and either definition of depression. Thus, it is unclear how much impact general attribution of cause has on the development of postpartum depression. While there is some indication that dysfunctional attributions may contribute to PPD, more sensitive and specific measures of cognitive style may be needed to adequately test the influence of this variable.

Social/Environmental Variables. Stressful events are, by definition, conceptualized as challenges to adjustment, and social support is viewed as buffering the effects of stressors (Cobb, 1976). While pregnancy and childbirth have typically been viewed as stressful events in and of themselves, PPD researchers have considered that additional stressors during the pre- and postnatal periods contribute to adjustment difficulties. As a result, the impact of both general life events and stress more specifically related to the infant have been investigated. Studies assessing the influence of life events on depressive syndrome have had somewhat contradictory results. O'Hara, Rehm, and Campbell (1983), O'Hara, Neunaber, and Zekoski (1984) and O'Hara (1986) all reported that a higher frequency of negative life events was significantly related to depression for new mothers. Hopkins, Campbell, and Marcus (1987) found no relationship between frequency and degree of distress from negative life events and PPD. The primary difference between the studies was the use of a prospective design by the O'Hara researchers, and a retrospective design by Hopkins et al. The argument that retrospective studies may be contaminatd by depressive distortion (i.e., that reports of negative life events are inflated) does not appear to be supported by these results. Depressive symptom studies have been in agreement regarding the relationship with stressful life events. Paykel et al. (1980) and O'Hara, Rehm, and Campbell (1982) found that more stressful life events were experienced

since the beginning of pregnancy and since delivery by postpartum depressed women than by women in the nondepressed group. Atkinson and Rickel (1984) found a lack of positive life events since birth to be related to postpartum depression in first-time parents. They concluded that the lack of enjoyable events was due to disruption from the new baby, suggesting indirect support for the influence of infant-related stressors on PPD.

More direct evidence for the impact of infant stressors was provided by studies assessing the effects of infant temperament and childcare stressors (e.g., poor health of infant, problems with feeding and sleep schedules). It has been noted through clinical observation that mothers with more temperamentally difficult infants show signs of depression and feelings of inadequacy (Oberklaid, 1979). Thomas and Chess (1977), who have done extensive work assessing infant temperament, defined it in terms of the way in which an individual behaves. They conceptualized temperament as behavioral style, distinct from ability or motivation. They found, in their longitudinal studies, that a child's specific tempermental traits can affect the parents' functioning and responses to the child. In the postpartum literature, Cutrona and Troutman (1986), in a path analytic study of 55 women, found that difficult infant temperament (measured by observation, crying records, and parent rating) was strongly related to maternal depressive symptoms, but the impact was mediated by the mother's view of herself as competent. Hopkins et al. (1987) reported that depressed mothers (meeting RDC criteria) rated their infants' temperaments as more difficult, more unadaptable, and more unpredictable. It is not clear whether a more difficult infant temperament contributed to maternal depression, or whether depressed mothers viewed their infants as more cranky and fussy. Whiffen and Kimball (1985) similarly reported that depressed mothers rated their infants as more difficult. However, their measures addressed the question of depressive distortion. Almost half

(45%) of the depressed subjects' babies were independently diagnosed as colicky by a physician, compared to only 15% of nondepressed women's infants. A colicky baby is likely to be perceived as more difficult temperamentally, suggesting that the direction of effect may be from infant stressor to depression. Stressors related to childcare were also found to impact on postpartum depression. O'Hara (1986), O'Hara et al. (1984), and Cutrona (1983) all reported that more stressful childcare events were experienced by women with a postpartum depressive syndrome than women not depressed in the postpartum.

The number and nature of relationships with others have been hypothesized to moderate the impact of stressor variables in the social support literature (Hopkins et al., 1984). The quality of the marital relationship and the support provided by the husband have been found to be particularly important in the development of postpartum depression (e.g., Braverman & Roux, 1978; Kumar & Robson, 1984; O'Hara et al., 1983; Tietjen & Bradley, 1985). O'Hara (1985) found that the husband's satisfaction with the marriage was correlated with the wife's satisfaction with the support from her husband, suggesting that men who were satisfied with the state of their relationship were more likely to provide the needed support to their spouses. Leung (1985) acknowledged that spousal support was important, but also found that social support from extended family impacted on maternal depression. In his study of Asian families, he found that support from other family members was associated with lower depression levels in new mothers. In a prospective study of married women, Cutrona and Troutman (1986) found that women who reported high levels of support from spouse and others during the prenatal period reported greater self-confidence as a parent and less depression at three months postpartum. In addition, Cutrona (1984) found that overall social support predicted depressive symptoms in the later weeks of the postpartum period (i.e., 8 weeks) but not in the first two weeks following childbirth. Braverman and Roux (1978) and

Kumar and Robson (1984) both found that women who reported marital problems during pregnancy were more at risk for depression in the postpartum. Finally, Paykel et al. (1980) reported an interaction of social support and life events, such that a lack of marital support only affected depression in the presence of stressful life events, thereby acting as a vulnerability factor.

These studies were primarily based on correlational data, and thus it is difficult to establish whether depressed women perceived less support from spouses and others, or if lower levels of support resulted in greater postpartum depression (cf. Gotlib & Hooley, 1988). Prospective studies such as Cutrona and Troutman's (1986) tend to support a buffering interpretation of support on depression.

General Research Issues for Postpartum Depression

The equivocal findings presented in the previous sections reflect, to some extent, methodological problems in the area of postpartum depression research. While study quality has improved in the past five to ten years, there are still a number of issues that must be taken into account when planning an investigation of postpartum depression in women, or considered when evaluating the research. Limitations in sample size and selection, study design, operationalization of depression, and use of theory may all contribute to the inconclusive results in many aspects of PPD research (i.e., rate, onset, etiology, etc.). Although not all studies contain all of these methodological problems, most have problems in at least one of the areas.

Sample Size and Selection. With an estimated 10% of postpartum mothers meeting criteria for a depressive syndrome, or even 20-25% experiencing depressive symptoms, smaller samples will only include a few of the subjects in which one is particularly interested. For example, with a sample size of 50 pregnant women, only 5 would likely be

depressed, which is very few on which to base conclusions regarding postpartum disturbances. The contradictory findings for epidemiological variables may well be related to sampling error due to the small number of women who are actually depressed. Since the population is somewhat less accessible than undergraduate college students, studies in this area tend to have samples of less than 100 (e.g., Cutrona & Troutman, 1986; O'Hara, 1985; Tietjen & Bradley, 1985), although there are exceptions (e.g., Kumar & Robson, 1984, n=119; Pitt, 1968, n=305). Even for group comparison studies, in which nondepressed and depressed postpartum women are selected, the sample size is still relatively small (e.g., Hopkins et al., 1987, n=24 per group; O'Hara et al., 1983, n=11 depressed, n=19 nondepressed). Small samples also put limits on the statistics one can employ, particularly in correlational designs, which in turn limits the sophistication of the research question.

Another potential problem with regard to sampling is representativeness. True random sampling of pregnant women (i.e., for prospective research) is difficult to achieve, since there are problems obtaining access to the population. Reseachers often have to rely on samples of convenience, most commonly by recruiting through prenatal classes or antenatal clinics (e.g., Atkinson & Rickel, 1984; Braverman & Roux, 1978). While there may not be as much of a selection factor for first-time mothers, since they are typically encouraged by their physicians to attend prenatal instruction, differences between those who do and do not utilize prenatal courses or clinics have not been investigated empirically. Thus, it is unclear how representative the sample is when obtaining subjects through those avenues. However, as in other types of research, careful description of the sample provides direction for generalizability of findings.

Study Design. Postpartum depression researchers have the unique opportunity of being able to anticipate when the presumed stressor event occurs and assess changes by measuring key variables both before and

after childbirth. However, too many studies have not taken advantage of the opportunity for prospective research and rely on a retrospective design instead (e.g., Paykel et al., 1980). It is difficult to apply experimental manipulations in this area. Thus, to obtain stronger support for causal conclusions, more prospective longitudinal studies are needed, rather than using a quick cross-sectional restrospective approach. The prospective approach, which would include assessment during pregnancy and in the postpartum, is especially important to assess whether depression is related more to the mothering role (Chalmers & Chalmers, 1986; Raphael-Leff, 1985) than just to childbirth and childcare. In the past five years, it appears that more researchers have begun to use a prospective design (e.g., Cutrona & Troutman, 1986; Graff, Dyck, & Schallow, 1991; Kumar & Robson, 1984; O'Hara, 1986; Tietjen & Bradley, 1985).

Operationalization of PPD. One problem that continues to be highlighted by reviewers (e.g., Cutrona, 1982; Hopkins et al., 1984; O'Hara & Zekoski, 1988) is the lack of a standard assessment strategy for postpartum depression, both in terms of measures used to define it, and time periods in which to assess it. Researchers have used symptom checklists (e.g., Little, et al., 1980), opinion (e.g., Gordon & Gordon, 1959), standard self-report of symptom (e.g., BDI - Atkinson & Rickel, 1984) and structured interview (e.g., SADS - O'Hara et al., 1984). In addition, assessment times have included single and multipoint measurement in the postpartum only or in pre- and postpartum periods (e.g., O'Hara et al., 1983; Paykel et al., 1980), and different time periods, including anywhere from two weeks (e.g., Cutrona, 1983) to two years postpartum (e.g., Raphael-Leff, 1985) and various times during pregnancy. The range of assessment instruments and measurement periods makes it difficult to compare results across studies. O'Hara (1984) noted that more recent studies are primarily defining PPD in terms of symptoms (standard self-report scale) or syndrome (structured

interview), but even with more uniform definitions, researchers must clearly specify their focus. The terms postpartum disturbance, postpartum adjustment, and postpartum depression have all been used to describe maternity blues, psychosis, and postpartum depression. Thus, studies often must be read carefully to determine how depression has been operationalized and when it was measured to distinguish among these types of postpartum disturbances. Few studies to date have used a syndrome definition of depression (e.g., O'Hara et al., 1984), but those that have directly compared symptom and syndrome epidemiological and etiological factors have suggested there may be differences between the two definitions of depression (e.g., Gotlib et al., 1989; O'Hara et al., 1984). The way PPD is operationalized may have a significant impact on the results of a study. O'Hara and Zekoski (1988) have suggested incorporating measures that are sensitive and specific to depression and adjustment in the puerperium.

Use of Theory. Most of the studies in the postpartum area have been descriptive and/or exploratory, investigating several possible variables that have been implicated by previous studies to be associated with PPD. While exploratory studies contribute useful information, integrating findings and determining direction for future research should be guided by theory, which has been lacking in the postpartum depression research (Hopkins et al., 1984). A few recent studies have begun looking to theoretical models to organize the inclusion of particular variables, rather than relying solely on empirical arguments (Cutrona, 1983; O'Hara, Neunaber, & Zekoski, 1984; Tietjen & Bradley, 1985).

Overall, while none of these methodological limitations are insurmountable, many studies do not attempt to address the problems. In particular, the lack of theory-driven research and the need for a greater specificity and sensitivity of measures may be the most crucial problems to deal with in order to improve research quality and

confidence in study results.

A Diathesis-Stress Model of Postpartum Depression

In general terms, a diathesis-stress model proposes that two types of variables, vulnerability (risk) factors and stressors, interact to produce a phenomenon. The vulnerability factors are hyothesized to be relatively stable, and may be, for example, genetic, biological, or psychological in nature. The stressors may be experienced as acute or chronic. In the psychosocial application of this model to general depression research, theorists have suggested that the risk factors are cognitive in nature, and stressors are defined as negative life events. For example, Abramson, Seligman, & Teasdale (1978), in their reformulated model of depression, described certain attributional styles that act in conjunction with particular life events to produce depression. More specifically, they argued that the style to attribute negative events to internal, stable, and global causes predisposes the individual to depressive reactions to those events. Support for this interactive model involving attributions has been found using both clinical (Persons & Rao, 1985) and nonclinical (Metalsky, Halberstadt, & Abramson, 1987) samples.

The cognitive model of general depression described by Beck (1983; Beck, Rush, Shaw & Emery, 1979) is similarly based on a diathesis-stress model, in which vulnerability to depression has a cognitive basis. He proposed that vulnerable individuals (characterized by dysfunctional attitudes or schema) are at risk for depression when stressful environmental events occur to which one is cognitively sensitive (Barnett & Gotlib, 1988). Depression results when stressors activate latent schemata. Beck described these schemata as relatively stable cognitive patterns or styles, which influence interpretations of situations and guide data collection and evaluation from everyday

experiencing, thereby influencing behavior. Schemata are conceptualized as enduring structures "by which information is attended to, interpreted, stored and retrieved" (Hammen, Marks, Mayol, & deMayo, 1985, p. 308).

Sociotropic and Autonomous Self-Schema

Two self-schemata or modes of psychological functioning relevant to depression have been identified through clinical and empirical data in research by Beck (e.g., 1983; Beck, Epstein, Harrison, & Emery, 1983) and, similarly, by Blatt and his colleagues (Blatt, D'Afflitti & Quinlan, 1976; Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982). These two types have been variously referred to as dependent and self-critical (e.g., Klein, Harding, Taylor, & Dickstein, 1988), sociotropic and autonomous (e.g., Beck et al., 1983), and anaclitic and introjective personalities (e.g., Blatt, 1974). Individuals with a dependent or sociotropic schema are described as basing their self-worth and well-being on positive interpersonal interactions, including intimacy, understanding, support and connection with others (Beck et al, 1983; Hammen et al, 1985; Robins, 1990). The socially dependent individual needs reassurance frequently, is devastated by rejection or perceived rejection, places importance on a stable relationship, and needs people for gratification (Beck, 1983). Autonomous or self-critical individuals are those who predominantly derive their sense of self-worth from preserving and increasing their own independence and attaining meaningful goals (Hammen et al., 1985; Robins, 1990). They tend to dislike asking for help, are generally self-confident, have their own internalized standards and goals, and judge their self-worth by success in fulfilling specific role expectations (e.g., 'good' parent or spouse; Beck, 1983).

The Congruency or Vulnerability Model of Depression

Beck's (1983; Beck et al., 1983) vulnerability model of depression is an interactive one. He suggests that the dependent and self-critical personality styles function as vulnerability factors leading to depression when stressful life events are experienced that are relevant to those particular domains (e.g., interpersonal and achievement, respectively). In other words, an individual whose evaluation of self-worth is related to interpersonal interactions and messages will be vulnerable to depression when experiencing stressors perceived to be of an interpersonal nature. On the other hand, an individual whose evaluation of self-worth is linked to meeting goals and achieving standards will be more vulnerable to depression when experiencing stressors that are perceived in terms of failure, blocking goals, or lack of control over the environment (Robins & Jacobson, 1987). Thus, Beck's model proposed that congruence between self-schema and type of stressful event can lead to depression.

This congruency model has been tested in a number of recent studies, using both clinical and nonclinical samples. Hammen, Ellicott, and Gitlin (1989) followed 27 unipolar depressed patients for up to two years, periodically measuring life events and depressive symptoms. The subjects had been classified a priori as dependent or self-critical. They found that the period in which depressive symptoms were the worst was related to the experience of life event stress that was congruent with depressive subtype. In other words, depression in dependent subjects was associated with the experience of more interpersonal stress, and depression in self-critical subjects was associated with the experience of more achievement/autonomy-related stress. In addition, they also found that severity of depressive symptoms was related to the magnitude of the vulnerability-congruent stress interaction, for autonomous but not sociotropic subjects. Segal, Shaw, and Vella (1989) reported partial support for the congruency model, using a clinical

sample of 26 remitted depressed patients. They followed patients, who had been previously assessed as sociotropic or autonomous, for six months, assessing the occurrence of congruent life events and level of depression. Results indicated that sociotropic subjects relapsed more often and were more likely to report depression after experiencing events categorized as interpersonal than achievement. However, for autonmous subjects who became depressed, the same congruency with life event content was not found to be significant. The researchers suggested that the self-critical schema is not as well elaborated or measured as the dependent schema, and thus the lack of results may be related to measurement problems rather than a failure of the model. Robins (1990) reported similar findings to those of Segal and his colleagues. In his study of 80 depressed patients, Robins found that highly sociotropic subjects reported significantly more recent negative interpersonal than negative autonomy-related events, whereas highly autonomous subjects did not report significantly more personality congruent events.

Studies using nonclinical samples also provided some support for the congruency model. Robins (1990) found that dysphoric university students reported greater frequency and impact of events congruent to their personality type than noncongruent events, although the differences were not significant. Nondepressed subjects did not show any trend to match personality type and reported life event stress. Zuroff and Mongrain (1987) used an experimental design to assess whether congruence between an event and self-schema would result in depression. Dependent, self-critical, and control (those who scored low on both scales) university students listened to audiotaped portrayals of rejection and failure. In response to the rejection episode, dependent subjects reported more depression than the other two groups. In response to the failure episode, self-critical subjects reported more depression than did dependent subjects, although the difference was not statistically significant. Hammen, Marks, Mayol, and deMayo (1985) also

tested the vulnerability or congruence model using university students. In their prospective study of 46 dependent and 32 self-critical subjects, they measured stressful life events and depression over a four month period. For both the dependent and self-critical subjects, depression was more strongly associated with schema-congruent negative events than with schema-incongruent negative events. However, for the latter group, the relationship was not statistically significant across all measures.

To summarize, the vulnerability or congruency model of depression proposes that depression is more likely to result for individuals who experience life event stressors that are congruent with their self-schema of sociotropy or autonomy, than for those who experience schema-incongruent events. Studies using both clinical and nonclinical samples have generally reported strong support for the relationship among depression, dependent self-schema, and the experience of events in the interpersonal domain. Less support has been found for the relationship among depression, self-critical schema, and the experience of events in the achievement domain. Many of the researchers have explained the weaker findings for the autonomous subtype in terms of construct operationalization problems. However, an additional possibility for the weaker support may be related to the way in which the events are categorized. In most of the studies cited above, the reported life events were objectively categorized as having consequences that are socially-related or achievement-related. The subjective meaning to the individual was not taken into account. For example, the break-up of a relationship might objectively be categorized as an event in the interpersonal realm, and be expected to only impinge on the sociotropic individuals. However, autonomous individuals might construe that same event as a personal failure, in which they did not succeed in the role of spouse or girlfriend, and thus react to the event with depression.

The Present Study: Application to Postpartum Depression

In the present study, it is proposed that the diathesis-stress model, which has been tested in the general depression literature, is applicable to the area of postpartum depression in order to clarify the role of the key empirically-identified variables: that is, cognitive vulnerability, infant-related stress, and partner support. Although the previous PPD review concluded that cognitive factors do play a role in the development of postpartum depression, the results are contradictory regarding the specific nature of this diathesis variable. It is proposed here that cognitive vulnerability to depression, assessed through the concepts of sociotropic and autonomous self-schemata, may provide a more sensitive and relevant description of the cognitive component related to postpartum depression. The diathesis-stress model would suggest that such depressogenic self-schemata are activated when the new mother experiences stress, resulting in depression. It is further proposed that, in the postpartum situation, some degree of stress is experienced due to the daily responsibility of caring for infants with varying levels of temperamental difficulty. The congruency research from the general depression literature, discussed in an earlier section, may further clarify the occurrence of postpartum depression following a self-schema/stress interaction. The primary stressor in the postpartum situation (difficult infant temperament) could be perceived to fall in both the interpersonal and achievement domains. That is, a more temperamentally difficult infant, characterized by less responsiveness and more negative affect, can challenge the sociotropic individual's sense of self-worth by perceived rejection and/or feelings of lack of connection with the infant. As well, autonomous individuals' sense of self-worth or competence can be diminished by the same situation, since a 'difficult' infant can challenge their feelings of competence and success as a 'good' parent. Finally, it is proposed that partner

support be construed as a protective resource or buffer against the infant-related stress. Beck et al. (1979) have argued that stable interpersonal relationships act as a buffer against the occurrence of full-blown depression , since strong support gives evidence of respect and acceptance. Partner support would likely be particularly important for those with a sociotropic self-schema, since understanding, connection, and reassurance are strong needs for these individuals (Beck, 1983).

The Research Hypotheses

In the current study, the empirical literature as well as the application of the diathesis-stress model to the area of postpartum depression suggested several testable hypotheses, which are described as follows:

Correlational analyses were expected to reveal that:

1. The quality of the couple relationship during pregnancy would be positively related to the quality of the couple relationship in the postpartum.
2. The quality of the relationship and satisfaction with the relationship would be positively related.
3. Postpartum depressive symptoms would be inversely related to satisfaction with partner support in the postpartum.
4. Postpartum depressive symptoms would be positively related to dependency and self-criticism.
5. Postpartum depressive symptoms would be positively related to difficult infant temperament.

The main hypotheses, related to the diathesis-stress model, were assessed using hierarchical regression analyses to determine the individual and interactive contribution of the independent variables to the prediction of postpartum depression such that:

6. Infant-related stress, cognitive vulnerability, and partner support would all contribute significantly to the prediction of postpartum depressive symptoms.
7. The interaction of cognitive vulnerability and infant-related stress would also significantly contribute to the prediction of PPD. More specifically, for new mothers with higher autonomous or sociotropic self-schemata, those who had more temperamentally difficult infants would be more likely to become depressed than those with less difficult infants.

Finally,

8. The interaction of dependency, infant-related stress, and partner support would contribute significantly to the prediction of postpartum depressive symptoms. More specifically, for new mothers with a more sociotropic self-schema, those who also had more temperamentally difficult infants, and who were experiencing little support from their partners, would be more likely to become depressed than those with less difficult infants.

METHOD

Overview of Design

Two hundred and one primiparous women were recruited through prenatal classes to take part in this longitudinal prospective study. They completed a questionnaire approximately eight weeks before their babies were due, and again four months postpartum. The questionnaire package included demographic questions, and measures assessing depressive symptoms, cognitive vulnerability, partner support, and infant temperament. The main hypotheses were tested using correlational analyses and hierarchical regression analyses.

Subjects

Two hundred and one women in their third trimester of pregnancy were recruited from twenty prenatal classes offered through hospitals, clinics, and privately in the city. Women who were 18 years and older, in a stable relationship with a male partner (i.e., married or cohabitating), and primiparous were invited to take part. A criticism of past studies has focused on the use of "mixed" samples (multi- and primiparous women), which in itself may be a confound. In addition, several studies have found that first-time mothers are more at risk for poor postnatal adjustment (e.g., Kendell, Rennie, Clark & Dean, 1981; Protheroe, 1969). The large sample size was selected for two reasons. First, since PPD occurs in approximately 10-20% women, a large sample is needed in order to "net" or include a substantial number of depressed women. Second, regression analyses require a large sample to provide sufficient power for assessing statistical analyses. Tabachnick and Fidell (1983) recommend 20 subjects per variable. There is potential for selection bias by drawing the sample from childbirth education classes. However, the possibility of a nonrepresentative sample is balanced against the lack of accessibility to this group through

individual physicians or hospitals.

Two hundred and forty nine women initially volunteered to take part in the study, out of 261 women who were approached. Two hundred and four subjects returned their questionnaires. Of the 45 people (18%) who did not complete the questionnaire, only one woman stated that she did not want to take part in the study. The remaining women said that (a) they had completed and mailed the questionnaire, but we had not received it, or (b) they had given birth to their babies earlier than expected, and as a result were not able to complete the questionnaire prenatally, or (c) they realized they were not eligible to participate after re-reading the criteria (i.e., in stable relationship; 1st-time mother; over 18 years of age). Three of the 204 women were not eligible to take part in the postnatal phase because of incomplete data (2) or no partner (1), so 201 subjects were involved in the postnatal data collection.

In the postnatal assessment phase, which was approximately six months after the prenatal data collection, 171 of the prenatal subjects returned their questionnaires, yielding an 85% return rate. One subject was not included in the final study because she had twins. Thus, the final sample consisted of 170 women who had completed both prenatal and postnatal data.

Procedure

Subjects were contacted five times in total. Initially, prenatal classes offered throughout the city of Winnipeg were visited. The study was introduced as a two-phase investigation of factors influencing postpartum adjustment. Those interested in taking part were asked to sign a consent form (see Appendix A), which included their names, phone numbers, addresses and due dates. They were given a questionnaire package (described in the next section) at that time, asked to complete it approximately eight weeks before the baby was due, and then mail it

in the stamped envelope that was provided. The subjects received a reminder phone call during the week that they were to complete the questionnaire. They were also given a birth announcement and asked to complete it and mail it once the baby was born.

Twelve weeks following the due date (or birth date if it was known), subjects were phoned to determine when the baby was born, and to request participation in the postnatal data collection phase. A questionnaire packet was mailed to the participants shortly after the phone call, and they were asked to complete it on the baby's four month birthdate, and return it within the week, in the stamped envelope provided. A follow-up postcard was mailed to remind subjects to return the questionnaire. If necessary, an additional reminder phone call was made.

In many other studies, timing for measurement in the postpartum period has ranged from a few days following childbirth, to a year postpartum, with the majority of researchers assessing depression six to twelve weeks postnatally. O'Hara and Zekoski (1988), in their review of the PPD literature, concluded that the time frame for the onset of PPD was in the three to six month range, and thus measurement of depression during that time frame would help ensure that late-onset cases were not missed. The four month measurement period was chosen as the time that would best balance the need for a later assessment point with the need to maintain subject involvement over an extended period of data collection (i.e, pre to postnatal).

The final contact was a letter to each of the subjects thanking them for their participation and providing a summary of the study results.

To enhance response rates of the mailed questionnaires, the packet was prepared based on Dillman's (1978) Total Design Method guidelines. He described a standard set of mail procedures to help overcome the limitations of mail surveys. He reported that the use of these

procedures has resulted in an average return rate of 77% in the 28 studies that have implemented them to date (Dillman, 1983). The method includes constructing the questionnaire such that, irrespective of the particular items, it does not appear bulky and long, the most interesting questions are at the beginning and the more sensitive questions are near the end, and answers are typed in uppercase and lined up vertically. For implementation of a mail survey, Dillman recommends such strategies as individually typing names and addresses, personally signing cover letters, sending follow-up reminder postcards, and providing postage-paid return envelopes.

To protect confidentiality, each of the subjects was assigned a code number so that the pre- and postnatal data could be matched without the use of names.

Instruments

The four primary variables of interest, that is, depressive symptoms, cognitive vulnerability, partner support, and infant-related stress, were measured using a questionnaire package. The prenatal administration of the package included self-report assessment of depressive symptoms, cognitive vulnerability and partner support, as well as demographic questions to provide a description of the sample (see Appendix B). In the postnatal questionnaire package, assessment of infant temperament was added, as well as questions regarding the delivery and health of the baby and detailing changes in daily routine (see Appendix C).

Depression Measures

Center for Epidemiological Studies Depression Scale (CES-D). The CES-D (Radloff, 1977) is a self-report scale designed to measure depressive symptomatology in the general population, with emphasis on the affective component of depression (see Appendix D). It has been

described as a valuable tool to identify high-risk groups, and to study relationships between depressive symptoms and other variables (Radloff, 1977). The 20 item scale assesses the frequency of particular depression-related feelings and behavior over the past week. The instrument was normed on a sample of 3000 respondents from the general population, and 105 psychiatric patients. The internal consistency was reported at .85 for the general sample, and .90 for the psychiatric group. Test-retest reliability ranged from .51 to .67 (over two to eight weeks), and was in the range of .32 to .54 for a three month to one year time span. The scale has strong concurrent validity, correlating significantly with several other depression measures (e.g., Beck Depression Inventory - Graff, Dyck, & Schallow, 1991). It clearly discriminated between the psychiatric and general population, as well as discriminating between individuals who stated that they needed help and those who did not (Radloff, 1977). Barnes, Currie, & Segal (1988) found that the CES-D scale was significantly associated with demographic variables that had been found in previous studies to be related to depression. The CES-D scale has only rarely been used in published studies of postpartum depression, to date, but it appears to be much more appropriate for this type of group.

Edinburgh Postnatal Depression Scale (EPDS). The EPDS (Cox, Holden, & Sagovsky, 1987) is a ten-item self-report measure designed to screen for depressive symptoms following childbirth (see Appendix E). Items were selected from related scales or constructed by the researchers, and were tested in extensive pilot study interviews with mothers of infants. Items were assessed for likelihood of detecting postnatal depression, and acceptability to mothers and health workers. Validation studies using puerperal women have found that the scale could clearly distinguish between nondepressed and depressed women, diagnosed using Research Diagnostic Criteria (Cox, 1986; Cox, Holden, & Sagovsky, 1987; Murray & Carothers, 1990) and DSM-IIIR criteria (Harris, Huckle,

Thomas, Johns, & Fung, 1989) for depressive illness. Each item is scored from 0 to 3: women scoring above a threshold of 12/13 are most likely suffering from depression; using a cutoff score of 9/10 was found to decrease failed detection of depressed cases to less than 10%. Split-half reliability of the scale was reported at .88, and internal consistency was found to be .87. The scale is straightforward, takes less than five minutes to complete, and was found to be acceptable to childbearing women. Given the recent development of this scale, it has been used infrequently in postpartum research to date, and has not been used in any published studies of North American samples. However, the specificity for puerperal women, and the decreased emphasis on somative symptoms (as compared to other standard depression measures such as the Beck Depression Inventory) make it useful for PPD studies.

Couple Relationship Measures (Adjustment/Support)

Dyadic Adjustment Scale. The Dyadic Adjustment Scale (Spanier, 1976) assesses the quality of both marital and nonmarital dyads (the latter is defined as a primary relationship between two adults who are living together). Spanier developed the scale on the premise that adjustment is an ongoing process along a continuum of well-adjusted to maladjusted, with a qualitative dimension that can be evaluated at any point in time. Most of the 32 items reflect the respondent's perception of the relationship's functioning (see Appendix F). The scale consists of four factors: consensus, satisfaction, cohesion, and affectional expression. Internal consistency was reported as .96 for the total scale, and ranged from .73 to .94 for the subscales. Validity also appears to be satisfactory. Three judges evaluated the scale for content validity, and only included items if they were considered relevant to and consistent with definitions of adjustment. In terms of criterion validity, each of the items correlated significantly with the external criterion of marital status. The mean total scores between married and

divorced groups were significantly different (married average score = 114; divorced average score = 70). The Dyadic Adjustment Scale was highly correlated with the frequently-used Marital Adjustment Scale (correlation of .86 among married respondents, and .88 among divorced respondents), indicating support for construct validity.

Support Behavior Inventory. The Support Behavior Inventory was developed by Brown (1986) to assess expectant couples' satisfaction/dissatisfaction with partner support. The inventory (see Appendix G) is more context-specific (for pregnant couples) and behaviorally-based than the DAS. It consists of 45 items describing specific supportive behaviors, half of which refer to pregnancy, and half of which are more general in nature. The pregnancy-related items were re-worded in the postnatal questionnaire to be relevant to the period following childbirth. Respondents rate the degree of satisfaction they experienced from their partner regarding each of the support behaviors, using a six-point rating scale, ranging from 1, dissatisfied, to 6, very satisfied. A four-point rating scale of importance of each of the behaviors was also implemented in this study. The SBI items were chosen to reflect House's four categories of social support: 1) emotional support (e.g., esteem, affection, trust,concern); 2) appraisal support (e.g., affirmation, social comparison); 3) informational support (e.g., advice, suggestions, information); and 4) instrumental support (e.g., money, time, labour). The scale was tested using expectant couples and pregnant women, to assess the importance of these behaviors during the prenatal period. The SBI has been implemented in over 50 studies, using perinatal, postnatal and general samples. Across these studies, the Cronbach alpha reliability coefficients have ranged from .90 to .96, and item-total correlations have ranged from .44 to .62 (personal communication, Brown, October, 1990).

Cognitive Vulnerability Measure

Personal Style Inventory. The Personal Style Inventory (PSI) was recently developed by Robins and Ladd (1987) to measure the constructs of sociotropy and autonomy, and was intended to improve upon problems in existing measures (i.e., Beck's Sociotropy-Autonomy Scale (SAS); Blatt's Depressive Experiences Questionnaire). In the more widely-used SAS, while the Sociotropy scale has satisfactory psychometric properties, the Autonomy scale has relatively low internal consistency and intercorrelation values (e.g., .15-.32 among the subscales and .58-.73 among subscales and higher-order factor of Autonomy; Robins & Block, 1988).In the PSI, Robins and Ladd have attempted to develop a more reliable and valid measure of the autonomy construct while maintaining the reliability and validity of the sociotropy construct.

The 60 item self-report inventory includes 30 items each to measure sociotropy and autonomy (see Appendix H). The Sociotropy scale assesses three theoretically related constructs: concern about what others think of the self; dependency on others for material or emotional support; and pleasing others. The Autonomy scale also assesses three theoretically related constructs: perfectionism/self-criticism; need for control or freedom from control of others; and defensive separation from others or avoidance of intimacy. The items were generated according to the following guidelines: each item was written to assess only one of the constructs, and to assess core aspects of those constructs; items were worded simply and unambiguously, and were not worded too extremely to allow for greater variance in subject response. Most of the items are modifications of items found in existing scales, but some new items have been incorporated. The PSI items are all scored using a six-point rating scale, ranging from strongly disagree (1) to strongly agree (6). Items were initially selected using a large undergraduate sample (n=342). A principal components factor analysis indicated two main factors: sociotropy and autonomy. Each of the items loaded most heavily

on its predicted factor. Internal consistency for the Sociotropy scale was reported as .88, and for the Autonomy scale as alpha = .82 for a student sample (Robins & Luten, 1991). For a clinically depressed patient sample, the Sociotropy and Autonomy scales had internal consistencies of .88 and .83, respectively (Robins & Luten, 1991).

Correlation between the two scales has been reported as .33, and test-retest reliabilities over five to thirteen weeks, in a student sample, were .80 for Sociotropy and .76 for Autonomy. Given the recency of the scale, there have been few tests for validity at this time. However, Robins and Luten (1991) reported that both the Sociotropy and Autonomy scales were significantly correlated with predicted clinical features of depression and not with nonpredicted features. That is, high scores on Sociotropy were significantly associated with a sociotropic clinical feature composite, including variability of mood and response to reassurance. High scores on the Autonomy scale were significantly associated with an autonomous clinical feature composite, including feeling like a failure and irritability.

Infant-Related Stress Measures

Revised Infant Temperament Questionnaire (R-ITQ). The Revised Infant Temperament Questionnaire is a parent-report scale used to assess temperament of infants aged four to eight months. It was developed by Carey (1970), based on the conceptualization of temperament and longitudinal research by Thomas et al. (1963). The R-ITQ (see Appendix I) consists of 95 items that describe specific infant behaviors, relating to nine dimensions of temperament. Those dimensions are: activity, rhythmicity, approach, adaptibility, intensity, mood, persistence, distractibility, and threshold. Items are rated on a six-point scale, ranging from "almost never' (1) to "almost always" (6), to describe the frequency with which the infant exhibits the behavior. The items are summed to obtain a score for the infant on each of the

temperamental dimensions, and then the pattern of scores on a subset of the dimensions allows for categorization of the infant as (a) difficult (b) intermediate-high difficult (c) slow to warm up (d) intermediate low easy, and (e) easy. For this study, a shorter version of the scale was used, based on the 54 items that are directly used to categorize temperament.

The questionnaire has strong psychometric properties. It was standardized on 203 infants aged 3 1/2 to 8 1/2 months. Carey and McDevitt (1978) reported test-retest reliabilities over a two week period ranging from .72 to .93. Internal consistencies ranged from .49 to .83 in the same study. The total inter-item correlation was .83. Evidence for validity has been provided by Carey and McDevitt (1978), who found that scores on the R-ITQ were correlated with mothers' general evaluations of their infant's difficulty, and by Milliones (1978), who reported a significant association between maternal responsiveness and scores on the R-ITQ. Colic (Carey, 1972) and frequent crying (Sarrett, 1976, cited in Carey & McDevitt, 1978) were significantly correlated with scores on the original infant temperament questionnaire. Cutrona and Troutman (1986) found that infant temperament difficulty (measured by the R-ITQ) was significantly related to the frequency of infant crying. While the scale takes approximately 25 minutes to complete, mothers have responded positively to it, reporting that completing the scale has helped sharpen their awareness of their infant (Brewer, 1982).

Daily Crying Record. To provide additional confirmation of difficult infant temperament and resulting stress on the parent, mothers were asked to chart the frequency and duration of their infants' crying for a seven day period. While frequency of crying is not the only characteristic of a difficult infant, fussiness was reported as the general underlying factor of a commonly-used infant temperament scale (Bates, Freeland & Lounsbury, 1979). Since the infant has a rather limited behavioral and vocal repertoire, crying serves as the primary

mode to express negative reactions. Following Cutrona and Troutman's (1986) method of assessing crying frequency, mothers were provided with a seven day time sheet, where each day was marked off in hour intervals (see Appendix J). They were asked to record the approximate number of minutes (from 0 to 60), for each hour interval, to indicate how long the infant cried during that period. The total minutes of crying was summed across the week and divided by seven to obtain a mean daily crying time.

RESULTS

Study Participants

In the prenatal stage of the study, 204 subjects returned the questionnaires. Two subjects were dropped from the study because their questionnaires were incomplete and missing more than a fifth of their data. As well, one subject was ineligible because she did not have a partner. In total, 201 subjects participated in the prenatal phase. In the postnatal phase, one hundred and seventy-one questionnaires were returned, yielding a return rate of 85% over a six to eight month period. One subject was not included in the analyses because she had twins and it was expected that a multiple birth postpartum experience would be different than that of the single birth postpartum experience. Thus, the final sample consisted of 170 subjects.

To determine if there were any group differences between the 170 women who completed both phases of the study and the 30 women who did not, t-tests were carried out. Since the groups were unbalanced with regard to size, homogeneity of variance was assessed, and when it was found to be unequal, the Satterthwaite solution was applied. The groups were compared on several demographic variables and on the prenatal measures of depression (CES-D, EPDS), cognitive style (PSI), relationship quality (DAS), and satisfaction with support (SBI). As can be seen in Table 1, there were only two significant group differences ($p < .05$). The women who had not completed the final phase of the study had shorter relationships with their partners, on average, prior to having the baby ($t=2.06$, $p=.04$), and reported slightly higher depressive symptomatology on the CES-D (but not the EPDS), on average ($t=-2.39$, $p=.02$), than the 170 women who completed the study. However, when the Bon Ferroni correction for multiple tests was calculated ($p \leq .005$), none of the group differences were significant at the adjusted level.

Table 1

Group Means for Prenatal Phase Nondropouts versus Dropouts

	CESD	EPDS	SBI	DAS	SOC	AUT	AGE	EDUC	INC	OCC	REL
170	10.5	7.4	227.2	118.3	107.9	102.1	27.7	5.9	7.0	2.6	2.6
30	14.2*	8.4	222.9	118.4	112.7	104.9	26.1	5.5	6.0	2.3	2.1*

Note. CES-D=Centre for Epidemiological Studies-Depression; EPDS= Edinburgh Postnatal Depression Inventory; SBI=Support Behavior Inventory; DAS=Dyadic Adjustment Scale; SOC=Personal Styles Inventory-Sociotropy; AUT=Personal Styles Inventory-Autonomy; EDUC=education level;INC=income level; OCC=occupation; REL=length of time in relationship. 170=number of subjects; 30=number of dropouts.
* $p < .05$; not significant at BF correction $p \leq .005$.

While the "dropout" group showed a tendency to report higher prenatal depressive symptomatology than the participants who completed both phases of the study, it is unlikely that the higher depression level contributed substantially to the 15% study mortality rate across the postnatal phase. Only eight of the 30 women whose questionnaires were not returned postnatally actually declined to take part, and in all cases it was after initially agreeing to accept the questionnaire. Of those eight women, one was out of the country, two were physically ill, two received questionnaires too late to complete them (they had been delayed by Canada Post past the required completion point; i.e., the infant's four month birthdate), and three had given birth to twins, and reported that they did not have enough time to complete the questionnaire. Of the remaining 22 "dropout" subjects, ten could not even be reached by telephone for inclusion in the final phase (their phone numbers were no longer in service), and twelve women said they had returned their questionnaires to the researcher but the packages were

never received. Thus, none of the subjects who could be reached had refused to complete the questionnaire when contacted by telephone, and only eight of the thirty "dropout" subjects later declined, for the reasons just described.

Sample Description

The women who participated in this study were all first-time mothers in a stable relationship with a heterosexual partner. The women ranged in age from 19 to 38 years old, with an average age of 28. Ninety-two percent of the women were married to their partners, and only eight percent were living common-law. Almost two thirds of the couples (61%) had been together for two to six years; 18% had been together for less than two years, and 20% had been together as a couple for more than six years. Three-quarters of the women had some post-secondary education, ranging from technical school training to graduate degrees. Virtually all of the women were employed prior to having the baby (75% full-time; 13% part-time). Of those who were working, almost half were employed in clerical positions, 26% worked as professionals, and 19% were in managerial jobs. Ninety-five percent of the partners were also employed (91% full-time; 4% part-time). The average annual couple income for the sample was in the $40,000 to $50,000 range, with a median income in the upper end of that range. Most of the women (86%) reported that they planned to return to their jobs after the baby was born, however, only half of the women were planning to return to work on a full-time basis.

Comparison with data from the Manitoba Centre for Health Policy and Evaluation (from the Manitoba Health Services Commission data base, Mustard, 1992) suggested that the study's sample is generally representative of first-time mothers in Winnipeg, with the exception that lower income women may be underrepresented. During an eighteen month period (July 1987 to December, 1988), 12,646 babies were born in

Winnipeg, of which 44% were first births. First-time mothers in Winnipeg ranged in age from 14 to 46 years old. Of that group, 81% were in the age range sampled by this study, and the mean for the equivalent age range (19 to 38 years old) was 27 years old. Statistics regarding attendance at prenatal classes for first-time parents suggested that this sample may underrepresent those individuals of lower socioeconomic status, since only half of the women in the lowest income quintile attended prenatal classes, whereas two-thirds to three-quarters of primiparous women in the remaining income groups attended prenatal classes prior to having their first baby. Lower income mothers may also have been underrepresented because of the study's eligibility criterion that participants be involved in a stable relationship. According to the MCHPE data, more first-time mothers in the lowest income quintile were single than were married, which further decreased the likelihood that they would take part in this study. Finally, women in the lowest income quintile were younger, on average, than women in the higher income quintiles, and given the minimum age requirement of 18 years for this study, it suggests a further reason why individuals in the lower income bracket would be underrepresented in this sample. There was no data available to assess comparability of education level.

The majority of women reported that their babies were delivered vaginally; only ten percent of the infants were born by caesarian section. Sixty-four percent of the women reported that they breast-fed their babies. Half of the sample did not report APGAR scores for their infants. Based on the 85 subjects who did recall the scores, the average APGAR was eight (out of ten) at one minute, and nine at five minutes after birth. One tenth of the infants required some level of neonatal care in hospital following birth. The length of stay ranged from 1 to 30 days, and the reasons for special care included premature birth and jaundice. The women in this sample reported that their partners spent, on average, 2 hours per day alone with their babies,

whereas the mothers were the sole caretakers an average of 11 hours per day. Almost one-quarter of the sample said that they had no childcare support besides their partners; 70% of the group said that additional childcare support was available from relatives.

An examination of bivariate correlation matrices (Pearson product-moment correlations) indicated that most of the demographic variables had correlations of $r < .20$, and were not significantly related to the depressive symptom and relationship measures (see Table 2). There was no basis for which to expect that demographic information would be

Table 2

Pearson and Spearman Correlations between Demographic Variables and Depression and Relationship Scales

		AGE	EDUC	INC	OCC	REL[a]	FWORK[a]	MWORK[a]
CESD	PRE	-.05	-.07	-.27*	-.09	-.05	.13	.15
	POST	.01	-.05	-.25*	-.20	.02	.10	.25*
EPDS	PRE	-.07	-.14	-.22	-.11	-.04	.11	.13
	POST	-.07	-.08	-.20	-.21	.02	.05	.18
SBI	PRE	-.01	-.02	.03	.04	-.01	-.01	-.12
	POST	-.04	.04	.09	.05	.01	.02	-.14
DAS	PRE	-.19	.03	.07	-.06	-.11	.08	-.11
	POST	-.16	.02	.03	-.02	-.07	.11	-.19

Note. EDUC=level of education; INC=annual couple income; OCC=subject's occupation; REL=length of couple relationship; FWORK=subject's amount of work (full-time to unemployed); MWORK=partner's amount of work. CES-D=Centre for Epidemiological Studies-Depression; EPDS=Edinburgh Postnatal Depression Scale; SBI=Support Behavior Inventory; DAS=Dyadic Adjustment Scale.

[a] Denotes Spearman correlations, which are more appropriate for the REL, FWORK, and MWORK correlations.

* $p \leq .001$

related to cognitive style or infant temperament, so those correlations were not assessed. As can be seen in Table 2, when the p value was adjusted for multiple tests (adjusted $p \leq .001$), significant relationships were found among financial measures and the CES-D, with a trend toward significance on the EPDS, the other depression scale. Lower couple income and a partner working less than full-time were both associated with higher reported levels of depressive symptomatology in the postnatal period. Income was also inversely related to reported prenatal depression, such that higher depression was associated with lower income.

T tests were also done to assess group differences on the depression and relationship measures for marital status. Table 3 displays the results, with p adjusted for multiple tests ($p \leq .006$). There were clear group differences on the relationship measures: those subjects who were living together rated the quality of the couple relationship as significantly less positive in the postpartum (lower scores) than did those who were married. The women who were not married also indicated significantly less satisfaction with partner support both before and after the baby was born. There was a trend toward higher depression scores (on both CES-D and EPDS) in the prenatal period but not the postnatal period for those women who were not married. However, the trend was not significant at the adjusted level for multiple tests.

Psychometric Properties of the Prenatal/Postnatal Scales

Preliminary statistical analyses were conducted in order to determine the characteristics of the data. For each of the scales, there was minimal missing data among the item responses (< .01%). A visual examination of the data determined that there were no obvious patterns to the missing values. At most, there was typically one or two responses missing for an item, and no one particular subject was missing more than a few responses overall. Given the large number of variables,

Table 3

T tests of Group Differences on Depression and Relationship Measures for Marital Status.

		Mean	Variance	T value	Significance
CESD PRE:	Married	9.84	Unequal	-2.43	.03
	Living together	17.15			
CESD POST:	Married	8.67	Equal	-0.52	.60
	Living Together	9.69			
EPDS PRE:	Married	7.19	Equal	-2.27	.02
	Living together	9.85			
EPDS POST:	Married	6.68	Equal	0.13	.89
	Living together	6.53			
DAS PRE:	Married	119.59	Unequal	2.59	.02
	Living together	105.08			
DAS POST:	Married	114.32	Equal	4.02	.00*
	Living together	99.31			
SBI PRE:	Married	229.57	Equal	3.79	.00*
	Living together	199.54			
SBI POST:	Married	215.97	Equal	4.68	.00*
	Living together	168.85			

Note. Married n=157; living together n=13. CES-D=Centre for Epidemiological Studies Depression; EPDS=Edinburgh Postnatal Depression Scale; DAS=Dyadic Adjustment Scale; SBI=Support Behavior Inventory.
* adjusted $p \leq .006$.

and the small booklet in which the measures were presented, it is likely that many of the missing responses were items that were inadvertantly skipped when completing the questionnaire. Mean scores for every item on each scale were calculated for the available sample, and used to replace missing data. This method is considered to be a conservative approach to dealing with missing data since it does not appreciably

alter the mean value of the variable, and it is appropriate when the amount of missing data is not large (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989). Missing data for the crying record was dealt with in a slightly different way. There were a few cases where crying time was not reported for one of the seven days. There was large variability among the sample for crying time, so the infant's own daily mean crying time, based on the reported six days, was calculated and used to replace the missing data, rather than using the sample mean.

The data were examined for outliers, normality, linearity, and heteroscedasticity following procedures suggested by Tabachnick and Fidell (1989). This examination involved inspection of histograms, skewness and kurtosis values, and normal probability plots for each of the scales, as well as examination of scatterplots. All of the scales were transformed to z values to inspect univariate outliers. Based on the criteria of $z > |3|$ to identify outliers, typically there were one or two cases on each of the scales (prenatal and postnatal). However, given the large sample size (n=170), it was expected that a few outliers would normally be present (Tabachnick & Fidell, 1989). Visual inspection of the histograms indicated that all of the primary measures (i.e., CES-D, EPDS, SBI, DAS, PSI, RITQ) were relatively normally distributed, with some tendency to positive skewness in the depression measures, and a slight tendency to negative skewness in the relationship measures. Since high levels of depression occur at a lower rate in the general population, the postive skewness was not surprising. Similarly, subjects were required to be involved in a stable relationship in order to participate in the study, so it is not surprising that the sample was generally satisfied with the quality of the couple relationship, resulting in a tendency to negative skewness on the relationship measures. Multivariate outliers, multivariate distribution assumptions, and multicollinearity diagnostics will be discussed at a later point in conjunction with regression analyses.

Means, standard deviations, and internal consistencies of the depression, relationship, and personality measures were assessed both pre- and postnatally, and are reported in Table 4. The correlational relationships across time for each of the measures are also tabulated below. The stress variable was only assessed postnatally, using infant temperament and crying record measures. The Revised Infant Temperament Questionnaire (RITQ) yielded scores on five subscales, which were then combined (as directed by Carey & McDevitt, 1978) to categorize the infant as one of five temperament types (scored as 1 to 5): easy, intermediate easy, slow-to-warm-up, intermediate difficult or difficult temperament. The RITQ had a mean of 2.5 and a standard deviation of 1.4. Infant temperament research suggests that approximately 10% of babies have difficult temperaments, up to 40% of babies have easy temperaments, and the remainder fall somewhere in between (Chess & Thomas, 1986). The breakdown for this sample was as follows: 29% of the infants were categorized as easy, 29% as intermediate easy, 14% as slow-to-warm-up, 17% as intermediate difficult, and 11% as difficult. The infant crying record provided information on the total number of minutes cried per day for seven days. The total weekly minutes of crying was calculated for each infant. Ten subjects did not return the crying record. Based on 160 subjects, the mean minutes of weekly crying was 172 (standard deviation 137 minutes), with a range from nine minutes to 635 minutes of crying over the week.

The means and standard deviations of the primary scales were comparable to those reported in previous studies of nonclinical samples. Internal consistencies ranged from .81 to .97 across all the scales, and they remained consistent across the measurement periods. Overall, depressive symptoms decreased slightly from the prenatal to postnatal period. On the CES-D, depression scores increased for 34% of the sample, decreased for 62% of the sample, and stayed the same for the remainder. For the relationship measures, satisfaction with partner

Table 4

Psychometric Information for Prenatal and Postnatal Scales

	PRENATAL			POSTNATAL			
	Mean	STD	Alpha[a]	Mean	STD	Alpha	Pre/Post Correlation[b]
Variable							
CESD	10.4	7.7	.88	8.7	6.8	.84	.46*
EPDS	7.4	4.0	.83	6.7	3.8	.81	.45*
DAS	118.5	13.9	.92	113.2	13.5	.90	.72*
SBI	227.5	28.5	.96	212.4	36.9	.97	.69*
SOC	108.1	18.4	.90	107.2	19.8	.92	.83*
AUT	101.9	13.6	.81	100.8	13.5	.81	.72*

Note. CES-D=Centre for Epidemiological Studies Depression; EPDS= Edinburgh Postnatal Depression Scale; DAS=Dyadic Adjustment Scale; SBI=Support Behavior Inventory; SOC=Personal Style Inventory Sociotropy; AUT=Personal Style Inventory Autonomy.

[a] Cronbach's alpha. [b] Pearson r correlation between prenatal and postnatal scales

* p=.0001

support and the rating of the general quality of the couple relationship were lower in the postnatal period than in the prenatal period.

As expected, each scale was significantly correlated with itself across time. The trait measures of cognitive style (sociotropy and autonomy) were most highly correlated (SOC r=.83; AUT r=.72), and the state measures of depressive symptoms were more variable across time, correlating only moderately between the prenatal and postnatal measurement periods (CES-D r=.46; EPDS r=.45). It was predicted in Hypothesis 1 that the quality of the couple relationship (as measured by the DAS) in the prenatal period would be positively related to the quality of the relationship postnatally. This hypothesis was confirmed

(r=.72).

In addition to correlational analyses to assess the relationship of each scale across time, paired t-tests were used to determine whether the average change in score from the prenatal to postnatal assessment was significantly different from zero. It was expected that the state measures (depression and relationship constructs) would change over the six to eight month measurement period, and that the trait measure (cognitive style - sociotropy/autonomy) would remain relatively stable. Those expectations were confirmed, as can be seen in Table 5. Both depression scales and both relationship scales were significantly different from time 1 to time 2, whereas the characterological measure of cognitive style, assessed by the PSI Sociotropy and Autonomy scales, did not change appreciably over time.

Table 5

Paired t-tests of Scale Differences across Time

Variable	Mean[a]	STerror	T value	Significance
CESD	-1.65	0.58	-2.86	.005
EPDS	-0.73	0.32	-2.28	.02
SBI	-14.90	2.06	-7.24	.0001
DAS	-5.31	0.78	-6.79	.0001
SOC	-0.93	0.86	-1.08	.28
AUT	-1.09	0.77	-1.42	.15

Note. CES-D=Centre for Epidemiological Studies-Depression; EPDS= Edinburgh Postnatal Depression Scale; SBI=Support Behavior Inventory; DAS=Dyadic Adjustment Scale; SOC=Personal Style Inventory-Sociotropy; AUT=Personal Style Inventory-Autonomy.

[a] mean difference score (postnatal minus prenatal score).

One of the scales assessing the relationship construct, the Support Behavior Inventory, requested two types of ratings for various partner support behaviors. Subjects were asked to rate their satisfaction with and the importance of a range of possible supportive behaviors that their partners may or may not have provided during pregnancy and the postpartum. The importance component was intended as a way to further sensitize the satisfaction measure, and was not considered to be meaningful information by itself. In other words, certain types of supportive behavior might be important to the individual but are only relevant in light of the individual's satisfaction regarding whether the partner is carrying out that particular behavior. In order to combine the two types of information, the satisfaction rating was weighted by the importance rating for each item through multiplication of the two values. The weighted items were then added to create a scale which combined the importance and satisfaction components. For both the prenatal and postnatal measurements, this weighted scale correlated extremely highly with the nonweighted satisfaction scale ($r=.97$). Thus, the weighted scale, incorporating both satisfaction and importance ratings, was not included in further analyses, since it was apparent that this combined scale did not add information beyond that provided by the satisfaction rating on the support behaviors.

Correlational Relationships among the Predictor, Criterion and Other Variables

Pearson product-moment correlations were computed to assess the relations among the primary variables (see Table 6) and to inspect for multicollinearity. Generally, if two variables are highly correlated (i.e., greater than .80), there is reason to suspect the presence of moderate to severe multicollinearity (Farrar & Glauber, 1967; Tabachnick & Fidell, 1989). On the basis of the correlations, it did not appear

that multicollinearity was a problem in this sample, although there were two moderately high correlational relationships (CES-D with EPDS r=.71; SBI with DAS r=.74). This magnitude would be expected of similar (self-report) measures of the same constructs. Further multicollinearity diagnostics were carried out in conjunction with the regression analyses and will be detailed in a later section.

Table 6

Pearson and Spearman Correlations among the Prenatal and Postnatal Scales

	CESD	EPDS	SBI	DAS	SOC	AUT	ITQ[a]
CESD		.71*	-.36*	-.45*	.33*	.34*	
EPDS	.69*		-.29*	-.38*	.37*	.33*	
SBI	-.34*	-.27*		.60*	-.08	-.19	
DAS	-.40*	-.27*	.74*		-.16	-.27*	
SOC	.30*	.32*	-.16	-.21		.42*	
AUT	.31*	.30*	-.20	-.18	.53*		
ITQ[a]	.22*	.23*	-.10	-.12	.07	.03	
WKCRY	.13	-.01	-.04	-.01	-.03	.02	.15

Note. Prenatal correlations reported above the diagonal; Postnatal correlations reported below the diagonal. CES-D=Centre for Epidemiological Studies-Depression; EPDS=Edinburgh Postnatal Depression Scale; SBI=Support Behavior Inventory; DAS=Dyadic Adjustment Scale; SOC=Personal Style Inventory Sociotropy; AUT=Personal Style Inventory Autonomy; ITQ=Revised Infant Temperament Questionnaire; WKCRY=Weekly Crying Record.

[a] Denotes Spearman correlations for that variable.

* adjusted $p \leq .002$.

As described in the method section, two measures of each of the primary latent constructs were incorporated into the study. That is, the CES-D and the EPDS were used to assess depressive symptomatology, the SBI and DAS measured aspects of the couple relationship, the PSI assessed cognitive vulnerability based on two personality "types" (sociotropy and autonomy), and infant-related stress was measured using infant temperament and infant crying scales. Within-construct correlations between scales will be discussed first, and then the between-construct correlations among the different variables will be detailed.

Depressive symptomatology was measured by the CES-D and the EPDS. It was expected that the scales would be related since they have similar items; however the latter scale was included to determine if it provided a more sensitive measure of postpartum depression since it was specifically developed as a PPD screening measure. The CES-D was included because it is a widely-used self-report depression scale with strong psychometric properties. In this sample, 23% of the subjects scored above the CES-D cutoff point of 16 for depression in the prenatal period; 14% scored in the depressed range in the postnatal period. Using a conservative cutoff point of 12 on the EPDS, 14% of the subjects were depressed prenatally, and 13% scored above the cutoff postnatally. These depression measures were strongly correlated at both the pre- and postnatal measurement periods ($r=.71$; $r=.69$ respectively). Both scales had similar relationships with the demographic variables. Based on this information and the overlap in content of the scale items, it was concluded that the CES-D and EPDS may be relatively redundant measures of depressive symptomatology. Thus, the CES-D was selected as the primary criterion (or dependent variable) measure to be used in the regression analyses since it is more widely-used in this area of research, it covers a broader scope of depressive symptomatology, and it appears to be as sensitive in detecting depressive symptoms as the EPDS.

However, parallel regression analyses were run using the EPDS, with the expectation that similar results would be found. These analyses will be discussed in the following section.

The couple relationship was assessed both generally (using the DAS), in terms of overall quality or marital adjustment, and specifically (using the SBI), in terms of concrete supportive behaviors. As hypothesized (Hypothesis 2), the DAS and SBI were positively related. They were moderately correlated during pregnancy ($r=.60$), and were even more strongly related in the postpartum, with a correlation of $r=.74$. Inspection of graphical comparison of the relationship between these two scales at the pre- and postnatal measurement points suggested two reasons for the increased correlation postnatally. The ratings extended further down the lower end of both scales postnatally, and there were fewer positive ratings on the upper end of both scales postnatally (as indicated by a larger standard error bar at the upper end), thus forcing a steeper slope to fit the points, and resulting in a higher r (correlation) postnatally. In other words, those who were unhappy with their partners postnatally were dissatisfied to a greater extent, regardless of whether they were indicating the overall relationship or the specific behaviors. As well, there were fewer women who were extremely happy with their partners, but there were still some who rated satisfaction and quality quite highly. In the postnatal period at least, there appears to be a great deal of overlap between the two measures. Even though the content of the scales suggests that they are measuring different components of the couple relationship, some overlap is expected since they are assessing the same relationship.

Cognitive style was assessed using the Personal Style Inventory, which measured two types or styles that are putatively vulnerable to depression - sociotropy and autonomy. As indicated in previous studies, these two types are not purely orthogonal, but do have some overlap with each other. The finding was repeated here. Sociotropy and autonomy

were significantly correlated both pre- and posnatally (r=.42 and r=.53 respectively).

The Revised Infant Temperament Questionnaire and a weekly crying record were used to assess the infant-related stress variable. It was expected that there would be a clear relationship between these two measures. However, they were not significantly correlated (r=.15). Infant temperament was positively correlated with both the CES-D (r=.22) and EPDS (r=.23) measures of depression, however the weekly crying measure was not significantly related to any of the other variables, including the criterion variable of depression. While the weekly crying record monitored just one type of behavior (i.e., crying), the infant temperament score was based on ratings of a more comprehensive range of behaviors. It was concluded that the crying record did not provide a useful measure of infant-related stress either individually or in conjunction with the infant temperament scale. Thus, the infant temperament scale was used as the primary measure of the infant-related stress variable for the regression analyses.

In addition to the within-construct relationships between scales, the between-construct correlations among the scales were also of great interest. As can be seen in Table 6, the primary predictor variables were all significantly correlated with the criterion variable of depression. The depression scales were inversely related to both the DAS (quality of the couple relationship) and the SBI (satisfaction with partner support) at both measurement points. Hypothesis 3 was confirmed: it predicted an inverse relationship in the postpartum, suggesting that the lower the satisfaction with partner support, the higher the depressive symptomatology. The prenatal couple relationship measures were also significantly correlated with the postnatal CES-D measure of depressive symptoms (not reported in the table; SBI r= -.24, p=.002; DAS r=-.27, p=.0003). The cognitive styles of sociotropy and autonomy were positively related to the depression scales, confirming

Hypothesis 4. The higher one scored on sociotropy or autonomy, the higher the self-reported depressive symptomatology. As well, as mentioned earlier, depressive symptomatology was significantly related to infant temperament, suggesting that the more difficult the infant's temperament, the higher the self-reported depressive symptomatology. This finding confirmed Hypothesis 5.

T tests and correlational analyses were carried out to assess the relationship of other postpartum measures with depression. Table 7 displays the results of t tests which were used to assess group differences on the depression measures for type of delivery, breast-feeding, and neonatal care. There were no significant group differences (p adjusted for multiple tests such that $p \leq .02$) on either measure of depression for those women whose babies were delivered vaginally as compared to those whose babies were delivered by caesarian section, for those women who breast-fed their infants in comparison to those who did not, or for those women whose infants required neonatal medical care versus those who did not.

Correlational analyses among depression and postpartum change-in-routine measures revealed some significant relationships (see Table 8). While there was no relationship between depression and the amount of time either the father or mother spent alone with the baby, ratings of satisfaction with the amount of time spent away from the baby (i.e., involved in recreational activities), either individually or as a couple were significantly related to women's self-reported depression (on both the CES-D and EPDS measures). The two satisfaction questions were strongly correlated with each other (r=.67, p=.0001). When they were added together to form a two-item 'satisfaction with time away from the baby' measure, it correlated r= -.49 and r= -.43 with the CES-D and EPDS, respectively, and r=.36 with both the DAS and SBI scales. Depressive symptomatology was also significantly correlated with ratings of partner helpfulness with the infant (r=-.32, p=.0001). Those women

Table 7

T tests of Group Differences on Depression for Delivery, Breast-feeding and Neonatal Care

		(N)	Mean	Variance	T value	Significance
CESD						
Delivery: Vaginal		(153)	8.63	Equal	0.65	.51
	Csection	(17)	9.76			
EPDS						
Delivery Vaginal		(153)	6.53	Equal	1.37	.17
	Csection	(17)	7.88			
CESD						
Breast-feed	Yes	(110)	8.24	Unequal	1.20	.23
	No	(60)	9.67			
EPDS						
Breast-feed	Yes	(110)	6.29	Equal	1.74	.08
	No	(60)	7.37			
CESD						
Neonatal Care	Yes	(19)	11.57	Equal	-1.95	.05
	No	(151)	8.39			
EPDS						
Neonatal Care	Yes	(19)	5.74	Equal	1.12	.26
	No	(151)	6.79			

Note. CES-D=Centre for Epidemiological Studies-Depression; EPDS= Edinburgh Postnatal Depression Scale.

who perceived their partners to be less helpful with the infant also reported higher levels of depressive symptomatology on the CES-D.

Finally, t tests were carried out to compare (a) those subjects who scored above the cutoff on the CES-D during pregnancy ("antenatally depressed" n=39) with those who scored below the cutoff during pregnancy, and (b) those subjects who scored above the cutoff on the CES-D in the postpartum (n=24) with those who scored below the cutoff at that measurement point. A set of t tests were first done to compare group differences on demographic variables. During pregnancy, income was the only variable that differentiated between those who were depressed and those who were not ($t=2.65$, $p < .01$). The group scoring

Table 8

Pearson and Spearman Correlations Among Postnatal Depression and Postpartum Experience Variables

	Father	Mother	Activ	A-Satis	C-Activ	C-Satis	Helps[a]	Chores[a]	TAB
CESD	-.02	-.04	-.11	-.44*	-.12	-.46*	-.32*	-.21	-.49*
EPDS	-.03	.05	-.15	-.38*	-.13	-.41*	-.22	-.17	-.43*

Note. Father=father time alone with baby; Mother=mother time alone with baby; Helps=partner help with baby; Chores=partner help with chores; Activ=number of recreational activities/month; A-Satis=satisfaction with number of activities/month; C-Activ=number of couple recreational activities/month; C-Satis=satisfaction with number of couple activities/month; TAB=time away from baby. CES-D=Centre for Epidemiological Studies-Depression; EPDS=Edinburgh Postnatal Depression Scale.

[a] Denotes Spearman correlations for those variables.

* adjusted $p \leq .003$.

above the cutoff on the CES-D (depressed group) had a significantly lower average income than the nondepressed group. In the postpartum, there were no demographic variables that significantly differentiated those who were depressed versus nondepressed. There was a trend toward significance for income and occupation type, such that depressed individuals reported a lower income ($t=1.90$, $p=.06$) and a less professional occupation level ($t=1.87$, $p=.06$).

With regard to the etiological variables, those who were depressed during pregnancy also had significantly lower ratings on both the quality of relationship (mean=110 for depressed group; mean=120 for nondepressed) and satisfaction with partner support measures (mean=215

for depressed; mean=230 for nondepressed) in comparison to those who were not depressed. As well, they had higher scores on the sociotropy (mean=118 for depressed; mean=105 for nondepressed) and autonomy scales (mean=109 for depressed; mean=99 for nondepressed) than did those who were not depressed prenatally.

In the postpartum, the depressed group had significantly lower scores on both the prenatal and postnatal quality of relationship (DAS) scale than did the women who were not depressed following childbirth. For the satisfaction with support scale (SBI), the postnatal but not the prenatal ratings significantly differentiated the depressed and nondepressed groups in the postpartum. Finally, those women who were depressed postpartum reported significantly lower levels of satisfaction with the time away from the baby, both as an individual (mean=3.1 for depressed group; mean=4.3 for nondepressed group) and as a couple (mean=3.1 for depressed group; mean=4.1 for nondepressed group).

The Diathesis-Stress Model: Multivariate Analyses

Multivariate hierarchical regression analyses were used to test the proposed diathesis-stress model, and to evaluate the shared and unique contributions of the primary predictor variables to the criterion variable of depression. The SAS statistical package was used to perform these analyses. The main regression analyses were carried out using the CES-D scale as the dependent variable. Parallel regression analyses were also done using the EPDS as the dependent variable. Finally, post hoc analyses were carried out to clarify the relationships indicated in a priori analyses, and these are presented following the planned hierarchical regression analyses.

Prior to assessing the regression analyses, further multicollinearity diagnostics were calculated to determine if nonorthogonality among the predictor variables was problematic. In addition to assessing the pairwise correlations (presented in an earlier

section), variance inflation factors, eigenvalues, condition numbers and index, and variance proportions were calculated for the predictor variables (Graff, 1989). The variance inflation factor reflects the amount that the regression coefficient variance is "inflated" by multicollinearity. Typically, a VIF > 10 is indicative of more severe ill-conditioning or multicollinearity (Kleinbaum, Kupper, & Muller, 1988). The VIFs for the predictor variables ranged from 1.05 to 2.33.

Eigenvalues for purely orthogonal data have a value of 1.0. When one or more of the eigenvalues are close to zero, it suggests there may be a problem with multicollinearity. If the corresponding condition index is large, and the condition number (the last condition index) is greater than 30, these indices confirm that there is a multicollinearity problem (Freund & Littell, 1986). Variance proportion values pinpoint which predictor variables are involved in the problematic nonorthogonality; two or more proportions of .90 or higher that correspond with the small eigenvalues and large condition indices suggest problematic levels of multicollinearity (Kleinbaum, Kupper, & Muller, 1988). As can be seen in Table 9, for this sample only one eigenvalue approached zero (EGV=0.24). The corresponding condition index was relatively small, and the condition number (3.03) was clearly less than 30. If multicollinearity was a significant problem, it appeared that the SBI and DAS would be involved, since their variance proportions were quite high (.86 and .84 respectively) corresponding to the low eigenvalue. However, multicollinearity was not a problem for this sample, based on the diagnostic information (e.g., CN < 30, VIF < 10, etc.).

In order to test the proposed model, hierarchical regression analyses were used which involved four steps. In the first step, prenatal depression was entered as the only predictor variable of postnatal depression (both measured using the CES-D). In the second step, the primary predictor variables were added: that is, the postnatal

Table 9

Multicollinearity Diagnostics for Regression Predictor Variables

	EIGENVALUE	CI[a]	VARIANCE PROPORTIONS					
			CESD	SOC	AUT	DAS	SBI	ITQ
1	2.26	1.00	.06	.04	.05	.05	.04	.02
2	1.34	1.29	.02	.17	.13	.06	.08	.00
3	0.94	1.55	.02	.00	.02	.00	.01	.94
4	0.63	1.89	.84	.02	.27	.03	.01	.00
5	0.57	1.98	.04	.70	.52	.02	.00	.02
6	0.24	3.03[b]	.01	.05	.00	.84	.86	.01

Note. CES-D=Centre for Epidemiological Studies Depression-Prenatal Scale; SOC=Personal Style Inventory-Sociotropy; AUT=Personal Style Inventory-Autonomy; DAS=Dyadic Adjustment Scale; SBI=Support Behavior Inventory; ITQ=Revised Infant Temperament Questionnaire.

[a] CI=Condition Index.

b Condition Number.

measurement of the relationship variables (DAS & SBI), the prenatal measurement of the personality or cognitive style variables (Sociotropy & Autonomy), and the postnatal measurement of infant-related stress variable (RITQ). In the third step, the hypothesized two-way interactions between cognitive style (diathesis) and infant temperament (stress) were added to the regression equation, as cross-products of sociotropy x infant temperament and autonomy x infant temperament. Finally, in the fourth step, the proposed three-way interaction among relationship, cognitive style, and infant-related stress variables was added. Then, significance tests were done based on the change in R^2, to determine whether each increasingly complex model was significantly

different from the previous one, and thus determine whether the added information significantly contributed to the explained variance of the criterion variable of depressive symptomatology (Neter & Wasserman, 1974; Tabachnick & Fidell, 1989).

The initial regression analyses incorporated both of the relationship measures (DAS and SBI). However, because there was significant overlap as indicated by the strong correlations between the measures, when both scales were included in the regression equation, the DAS was a significant predictor variable (p=.02), contributing 7% of the explained variance, and the SBI became nonsignificant (p=.67), contributing 0% of the explained variance. In contrast, when they were included individually in separate analyses, they were each significant predictors, with the DAS accounting for 7% of the explained variance, and the SBI accounting for 4% of the explained variance in the criterion variable. Therefore, in further regression analyses, it was considered redundant to include both measures, so the DAS was used as the relationship variable.

Similarly, for the EPDS, when both relationship measures were included in the initial regression analyses, the SBI approached significance (p=.08), accounting for 2% of the variance; whereas the DAS was not significant at all (p=.89). When the scales were entered individually in separate analyses, the SBI was a significant predictor variable (p=.02), accounting for 3% of the explained variance, and the DAS was not a significant predictor variable (p=.11). Thus, for additional analyses using the EPDS, the SBI was included as the relationship variable.

The hierarchical regression analyses results for the CES-D scale are tabled below. As can be seen in Table 10, at each step the overall model was significant. From step 1 to step 2, in which the relationship, cognitive style, and infant temperament variables were added, the R^2 increased by .11. The test for significance yielded a

Table 10

Hierarchical Multiple Regression of Postpartum Depressive Symptom Level Using CES-D

Variable	R^2	R^2 change	F model	F change	SBeta[a]	SPC[b]	t value
Step 1	.22		46.13**				
CESD Pre					.46	.22**	6.79
Step 2	.32	.11**	15.13**	31.00**			
CESD Pre					.34	.22**	4.73
SOC Pre					.07	.01	0.92
AUT Pre					-.01	.00	-0.16
DAS Post					-.24	.07**	-3.87
ITQ					.14	.02*	2.15
Step 3	.35	.03*	12.52**	2.61*			
CESD Pre					.32	.22**	4.47
SOC Pre					-.19	.00	-1.29
AUT Pre					-.15	.00	-0.91
DAS Post					-.28	.07**	-4.03
ITQ					-1.33	.02*	-2.34
SOCxITQ					.95	.03*	2.10
AUTxITQ					.64	.00	1.01
Step 4	.36	.01	9.95**	2.57			
CESD Pre					.33	.22**	4.59
SOC Pre					-.18	.00	-1.23
AUT Pre					-.14	.00	-0.84
DAS Post					-.26	.07	-1.66
ITQ					- 1.23	.02*	-2.13
SOCxITQ					2.86	.03*	1.98
AUTxITQ					-1.31	.00	-0.78
SOCxITQxDAS					-1.89	.00	-1.34
AUTxITQxDAS					1.84	.00	1.21

Note. Bolded lines represent information added to the model in that

step. CES-D=Centre for Epidemiological Studies Depression-Prenatal Scale; SOC=Personal Style Inventory-Sociotropy; AUT=Personal Style Inventory-Autonomy; DAS=Dyadic Adjustment Scale; ITQ=Revised Infant Temperament Scale.

[a] SBeta=Standardized beta weight. [b] SPC=Squared semi-partial correlation.

* $p \leq .03$. ** $p \leq .001$.

significant $F_{(4,164)}=6.01$, p=.001, suggesting that some or all of the added variables contributed significantly to the prediction of the criterion variable. When the interaction terms were added to the regression model, the R^2 increased by an additional .03. This change was significant ($F_{(2,162)}=4.41$, p=.025), suggesting that the interaction of cognitive vulnerability and stress also contributed significantly to the prediction of postpartum depressive symptoms, over and above that explained by the other variables. Finally, when the proposed three-way interactions were added to the model, the change in R^2 was only .01, which was not significant ($F_{(2,160)}=.24$, p >.10).

Thus, the hierarchical regression analyses indicated that the variables included in step 3 represented the final regression model. Before discussing the details of the model, regression analysis assumptions need to be considered. Examination of the residual scatterplot suggested the possibility of two multivariate outliers, and also raised the question of normality of errors of prediction. With regard to possible outliers, additional statistics (studentized residual > 3 and a corresponding high Cook's distance, although not greater than 1.00) suggested that for two subjects, their high postnatal depression scores were not well predicted by the regression equation. However, upon closer inspection of the data for those two subjects, it appeared that they were clearly part of the group that was sampled, in terms of demographics. In addition, their data was congruent with the theoretical diathesis-stress model that was being tested. For one

subject, she had a high score on the sociotropy scale, an infant categorized in the difficult temperament range, and a low rating of quality of the couple relationship, all theoretically contributing to depression. Her prenatal depression score was very low, which likely accounts for the poorer prediction by the regression equation. The second subject had a high prenatal depression score, a high Sociotropy score, and a difficult infant categorization, again supporting the diathesis-stress model. The poor prediction for this subject was likely due to the relationship rating, which was average; the empirical regression equation would anticipate lower scores on the relationship rating. It was concluded that it was not feasible to drop the two outliers since they appeared to belong to the group that was sampled, and their data was generally in the theoretically-expected direction.

The other issue raised by inspection of the residual scatterplot was the question of normality of distribution. There appeared to be a slight tendency for nonrandom scatter, indicating a possible nonnormal distribution of the errors of prediction. Typically, when that is clearly the case, transformation of one or more variables is done to improve normality and reduce skewness (Tabachnick & Fidell, 1989). In this case, the scatter around the zero point was not clearly nonrandom. Further, if transformation was necessary, it was not clear which variable(s) should be transformed. The univariate statistics had indicated that, while most of the scales had some tendency to skewness, the skewness was not too severe or likely to be problematic, given the large sample size. Thus, it was decided that the data did not warrant transformation since (a) nonnormality was not clearly indicated and (b) it was not clear which variable(s) would be appropriately transformed.

The regression model illustrated in step 3 of Table 10 can now be considered in more detail. In this model, 35% of the total variance of the criterion variable was accounted for by the predictors. Prenatal depression was the strongest predictor of postnatal depression,

accounting for 22% of the explained variance. Neither the cognitive style of sociotropy nor autonomy were significant predictors of postpartum depressive symptoms. The quality of the relationship in the postpartum contributed 7% of the explained variance, whereas infant temperament accounted for 2% of the explained variance. Finally, the interaction of sociotropy and infant temperament accounted for 3% of the explained variance. Hypothesis 6 postulated that all three of the primary variables (cognitive style, quality of relationship, and infant-related stress) would significantly contribute to the prediction of postpartum depressive symptomatology. It was partially supported, since the relationship and temperament variables were significant predictors, whereas cognitive style (sociotropy and autonomy) was not. The diathesis-stress interaction was also hypothesized as a significant predictor variable (Hypothesis 7). In this sample, the sociotropy x infant temperament interaction was significant, whereas the autonomy x infant temperament interaction was not, again providing partial support for the hypothesis.

A suppression situation in the final (step 3) model was identified by both the large beta weights for ITQ and the interaction terms, and a negative ITQ beta weight which was opposite in sign to the positive correlation between ITQ and postnatal CES-D (Tabachnick & Fidell, 1989). There were not any suppression indicators in the model with first-order variables (step 2); thus the situation arose when the interaction terms were added, suggesting a relative rather than absolute suppression (Tzelgov & Henik, 1991). In other words, once the interaction terms were added, one of the predictor variables acted to both explain some variance in the criterion variable, and to "clear out" or suppress criterion-irrelevant variance from other predictor variable(s). Tzelgov and Henik (1991) reported that suppressor variables typically improve prediction in regression equations, particularly when the suppression relationship is between added predictors and predictors already in the

equation. That appeared to be the case here. Further analyses in which each significant predictor variable was alternately dropped from the model suggested that the infant temperament measure was acting as a suppressor variable for the infant temperament-x-sociotropy interaction term, such that it suppressed irrelevant variance or "noise" which would otherwise obscure the effects of the interaction (ITQxSOC) on the criterion variable (Cohen & Cohen, 1983; Tabachnick & Fidell, 1989). Tzelgov and Henik (1991) concluded that "suppression conditions are useful because they result in increased validity ..." (p. 535).

To further probe the significant interaction between sociotropy and infant temperament, the interaction was plotted according to guidelines provided by Swallow and Segal (1992) and displayed graphically in Figure 1. With all other variables in the equation held constant, three different values for the infant temperament and sociotropy scales were inserted into the regression equation. Following Cohen and Cohen (1975), the three values of low, medium and high correspond to values of one standard deviation below the scale mean, the scale mean, and one standard deviation above the scale mean, respectively. As can be seen in Figure 1, postnatal depressive symptom scores on the CES-D varied as a function of the level of infant temperament and the level of sociotropy. When infant temperament was categorized on the "easy" or low end of the scale, the level of sociotropy did not impact on depression scores. When infant temperament was categorized in the "difficult" range of the scale, the level of sociotropy clearly influenced depression scores. This analysis suggested that individuals with a high level of sociotropy and with temperamentally difficult infants were more likely to experience depressive symptomatology than were those individuals with lower levels of sociotropy and/or with temperamentally easy infants ($t_{(166)}=-2.08$, $p < .05$). Hypothesis 7 more specifically postulated that women with higher levels of autonomy and temperamentally difficult infants would be more

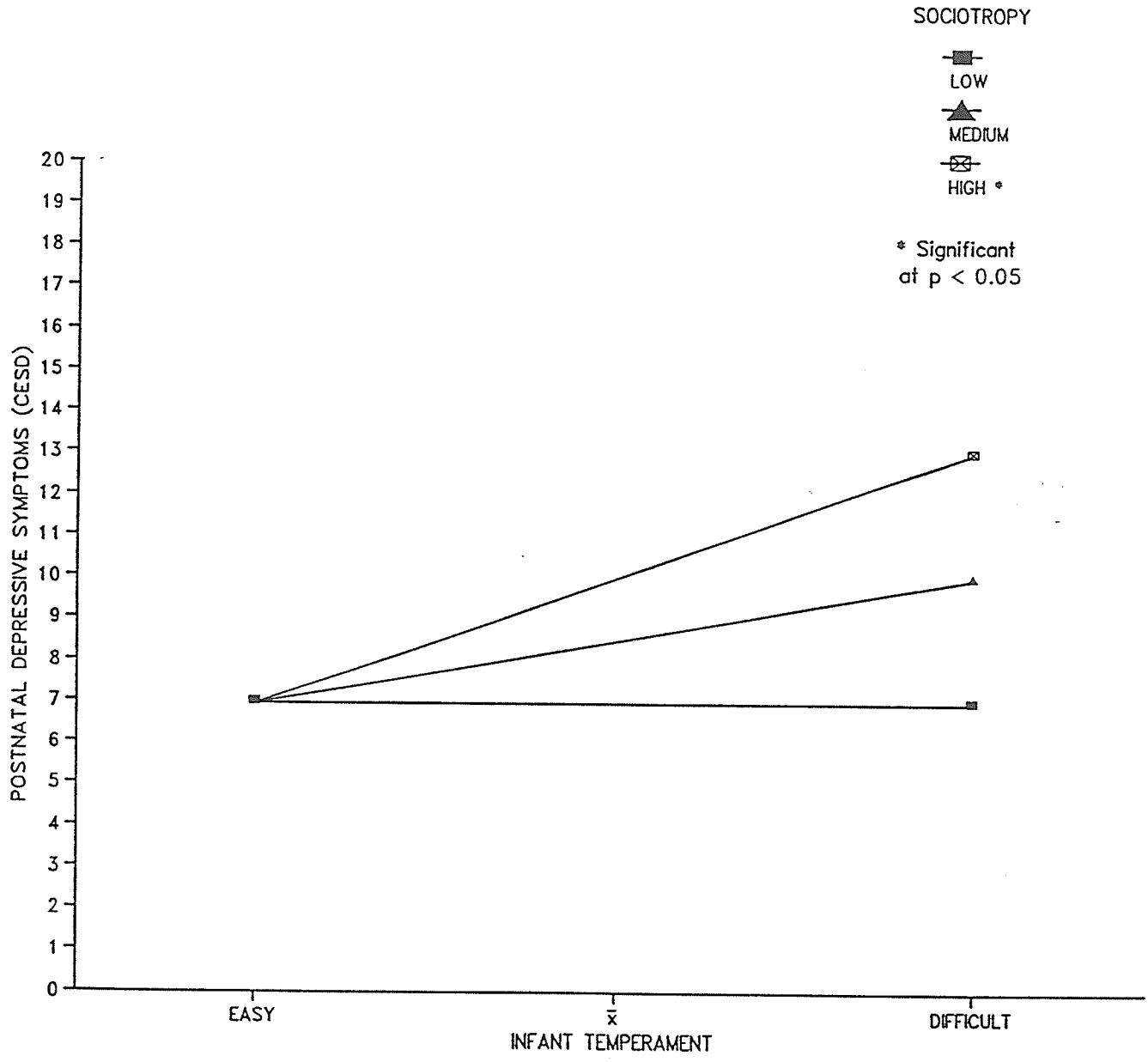

Figure 1: Depressive Symptomatology (CES-D) as a Function of Infant Temperament and Level of Sociotropy

likely to become depressed. The hypothesis was supported for the cognitive style of sociotropy, but a parallel finding was not confirmed for the style of autonomy.

Finally, hypothesis 8 anticipated a significant three-way interaction among cognitive style, quality of relationship and infant-related stress; this interaction was not significant in the model. More specifically, it was anticipated that women with higher levels of sociotropy, temperamentally difficult infants, and lower ratings on relationship variables would be more likely to become depressed than women with less difficult infants. This expectation was partially supported. However, the three-way interaction was not significant and thus the hypothesized contribution of relationship support in this context was not supported.

Parallel hierarchical regression analyses based on four steps were also carried out using the EPDS as the criterion variable rather than the CES-D. Again, in the first step, prenatal depression was entered as the only predictor variable of postnatal depression (both measured using the EPDS). In the second step, the primary predictor variables were added. They included the prenatal measurement of sociotropy and autonomy (SOC, AUT), the postnatal measurement of satisfaction with partner support (SBI), and the postnatal measurement of infant-related stress (RITQ). In the third step, the hypothesized two-way interactions between cognitive style and infant temperament were added. In the fourth and final step, the proposed three-way interaction among the relationship, cognitive style, and infant-related stress variables was added. The results can be seen in Table 11.

The results from these regression analyses indicated that the pattern of the relationship between the predictor variables and the EPDS was similar to that with the CES-D; however, the variables that were just significant in the CES-D regression analyses did not reach significance in the EPDS analyses. That is, while the pattern of the

Table 11

Hierarchical Multiple Regression of Postpartum Depressive Symptom Level Using EPDS

Variable	R^2	R^2 change	F model	F change	SBeta[a]	SPC[b]	t value
Step 1	.20		43.09**				
EPDS Pre					**.45**	**.20****	**6.56**
Step 2	.26	.06**	11.75**	31.34**			
EPDS Pre					.36	.20**	4.66
SOC Pre					**.15**	**.01***	**1.99**
AUT Pre					**-.09**	**.00**	**-1.27**
SBI Post					**-.17**	**.03***	**-2.36**
ITQ					**.13**	**.02[c]**	**1.83**
Step 3	.27	.01	8.77**	2.98			
EPDS Pre					.36	.20**	4.65
SOC Pre					-.06	.01	-0.40
AUT Pre					-.02	.00	0.14
SBI Post					-.16	.03*	-2.22
ITQ					-.09	.02	-0.16
SOCxITQ					**.75**	**.01**	**1.58**
AUTxITQ					**-.49**	**.00**	**-0.73**
Step 4	.28	.01	6.84**	1.93			
EPDS Pre					.37	.20**	4.69
SOC Pre					-.06	.01	-0.36
AUT Pre					-.00	.00	-0.01
SBI Post					-.25	.03[c]	-1.77
ITQ					- 0.12	.02	-0.20
SOCxITQ					.95	.01	0.85
AUTxITQ					-.95	.00	-0.75
SOCxITQxSBI					**-.23**	**.00**	**-0.22**
AUTxITQxSBI					**.52**	**.00**	**0.48**

Note. Bolded lines denote variables added to model at each step.

EPDS=Edinburgh Postnatal Depression Scale-Prenatal version; SOC=Personal Style Inventory-Sociotropy; AUT=Personal Style Inventory-Autonomy; SBI=Support Behavior Inventory; ITQ=Revised Infant Temperament Questionnaire.

[a] SBeta=Standardized beta weight. [b] SPC=Squared semi-partial correlation.

[c] indicates approaching significance (p=.065).

* $p \leq .05$. ** $p \leq .001$.

relationship between the criterion variable and the predictor variables was very similar for the EPDS as for the CES-D, the significance level dropped sooner, resulting in the infant temperament and the two-way and three-way interaction variables not contributing significantly to the regression equation. In step 2, the Sociotropy variable was just significant (p=.05), contributing 1% of the explained variance. The overall variance accounted for in the model using EPDS was lower than for the model predicting depression based on the CES-D (R^2=.28 and R^2=.36 respectively).

Post hoc regression analyses were done to determine the contribution of the 'time away from baby' (TAB) measure to postpartum depressive symptoms, since the measure was found to be strongly correlated with the depression measures. It was added to the final regression model (step 3) for the CES-D, which was discussed previously. As can be seen in Table 12, the predictor variables in this model accounted for 44% of the total variance of depressive symptomatology in the postpartum. The R^2 increased by .09, and this change was significant ($F_{(1,161)}$=25.71, p=.001), suggesting that the TAB measure contributed significantly to the prediction of postpartum depressive symptoms, over and above that explained by the other variables. With the addition of TAB, the other predictor variables that were significant in the final a priori model (i.e., prenatal depression, quality of relationship, infant temperament, and the interaction between sociotropy

Table 12

Multiple Regression of Postpartum Depressive Symptom Level (CES-D) with Added 'Time Away from Baby' Variable

Variable	R^2	R^2 change	F model	F change	SBeta	SPC	t value
	.44	.09	15.62**	3.10**			
CESD Pre					.25	.22*	3.64
SOC Pre					-.15	.00	-1.06
AUT Pre					-.15	.00	-0.97
TAB					**-.32**	**.14***	**-4.96**
DAS Post					-.18	.03*	-2.74
ITQ					-1.31	.01*	-2.46
SOCxITQ					.84	.03*	2.00
AUTxITQ					.69	.00	1.18

Note. Bolded line represents information added to the model. CES-D=Centre for Epidemiological Studies-Depression; SOC=Personal Style Inventory-Sociotropy; AUT=Personal Style Inventory-Autonomy; DAS=Dyadic Adjustment Scale; TAB=Time away from baby; ITQ=Revised Infant Temperament Questionnaire.

[a] SBeta=Standardized beta weight. [b] SPC=Squared semi-partial correlation.

* $p \leq .05$. ** $p \leq .001$.

and infant temperament) all remained significant. In this regression equation, the DAS contributed slightly less to the explained variance (3% as compared to 7% in the previous equation). It was not surprising that there was some overlap in their predictive abilities, given the moderate correlation between DAS and TAB (r=.36). One further regression analysis was done, adding a two-way interaction of TAB x Sociotropy, and a three-way interaction of TAB x Sociotropy x Infant Temperament, to assess whether TAB served as a modifier or buffer.

However, the R^2 did not increase (R^2 = .44), and the interactions were not significant. Thus, they did not add any information to the model.

Finally, to further assess the role of the relationship variable, two additional sets of regression analyses were carried out. First, the prenatal DAS measure was substituted for the postpartum measure of the DAS in the final regression model, to determine if marital ratings during pregnancy were predictive of postpartum depressive symptom levels. Results indicated that the overall model was significant ($F=9.54$, $p=.0001$) with prenatal depression scores, infant temperament and the sociotropy x infant temperament interaction remaining as significant contributors. However, the prenatal DAS was not a significant predictor variable ($t=-1.15$, $p>.10$). Second, two-way interactions of the postnatal DAS with sociotropy and infant temperament (i.e., DAS x sociotropy; DAS x infant temperament) were entered individually in place of the sociotropy x infant temperament interaction term, and in addition to the sociotropy x infant temperament interaction term. These regressions were done to assess whether the quality of relationship variable (DAS) was moderating the effect of the stressor (infant temperament) or perhaps serving as a stressor which was modified by the cognitive style of sociotropy. However, in all four regression analyses, while the overall model was significant, and other variables individually contributed to the prediction of postpartum depressive symptoms, none of the interaction terms involving the DAS were significant.

DISCUSSION

The present study was designed to evaluate a psychosocial diathesis-stress model of postpartum depression. On the basis of previous theory and research, depressogenic cognitive variables were selected as diatheses, and stressors were variables (e.g., infant difficulty, marital tension) that have contributed to adjustment difficulties in the form of depressive symptomatology following childbirth. Previous research has not evaluated the interactions between these variables within a diathesis-stress framework. To identify the main effects and interactions of cognitive style, infant-related stress, and partner support in the prediction of postpartum depression, this prospective study was carried out on a large sample of women, assessing them prior to and after the birth of their babies. The psychosocial variables were all found to be related to postpartum depressive symptomatology. More importantly, support for the diathesis-stress model in a postpartum context, using sociotropy as the cognitive diathesis, was also obtained. Finally, the present findings question the appropriateness of focusing on the postpartum per se without taking into consideration the entire childbearing period (i.e., pregnancy and the postpartum), in order to better understand the new mother's adjustment. The major findings relevant to each of the hypotheses will be examined first and articulated within the current literature. This discussion will be followed by a discussion of more general issues raised by the present results, including demographic and postpartum factors that were relevant, context specificity of measures, and depression rates in the pre- and postpartum.

The Research Hypotheses. Partners, personality, and prenatal depression: Their impact on postpartum depressive symptoms.

Hypothesis 1. This hypothesis stated that the woman's ratings of

the quality or adjustment of the couple relationship during pregnancy would be positively related to the quality of the couple relationship in the postpartum. The Dyadic Adjustment Scale, assessing quality of the couple relationship as rated by the woman, was highly correlated across time, suggesting that women's perceptions and/or experience of their relationship were relatively stable throughout the antenatal and postnatal period. There was a drop in marital satisfaction following the birth of the baby, however, which may have reflected strain associated with adjustment to the new caregiver role. A supportive partner is especially important to the new mother, since she is often housebound, tired from the demands of the young baby, and may have difficulty obtaining sufficient support from other individuals in her social network (Belsky, 1981). The new mother may expect or require more support from her partner following the birth of the baby, and be less satisfied with him if these increased expectations and needs are not met. Consistent with this explanation, Tietjen & Bradley (1985) reported that new mothers experienced a significant increase in stress from pregnancy to the postpartum. Graff, Dyck, and Schallow (1991) found that mothers who rated their infant as more demanding and difficult, implying a need for more support, also had a lower rating for the couple relationship in the postpartum.

Hypothesis 2. It was predicted that there would be a positive association between the general quality of the couple relationship (Dyadic Adjustment Scale) and the specific satisfaction with behavioral support (Support Behavior Inventory) during pregnancy and the postpartum. The Dyadic Adjustment Scale has been used in numerous studies to assess general marital comfort or distress. If the overall evaluation of the couple relationship is positive (or negative), one would expect some correspondence to satisfaction with the partner's specific supportive behaviors. It was thought that the Support Behavior Inventory might be relatively more sensitive than the DAS to couple

issues during the childbearing period since the scale was developed for expectant couples. The DAS appears to have provided a useful assessment of the couple's level of marital distress in this context, since the two measures were so highly correlated. Indeed, the extent of the relationship in the postpartum (r=.74) was somewhat surprising. It is also noteworthy that ratings on both instruments dropped after the baby was born. In the postpartum, women were generally more disatisfied with their partner's support, and those who were initially unhappy rated the relationship and satisfaction with specific supportive behaviors at an even lower level in the postpartum period. O'Hara (1986) also found that postpartum depressed women had lower ratings of their marital relationships and were more dissatisfied with the frequency of supportive behaviors from their partner than were nondepressed women, although they did not report any direct relationship between the two measures. Teitjen and Bradley (1985) directly compared the amount of partner support and ratings of marital adjustment and found that they were significantly related during pregnancy but only marginally related in the postpartum. However, satisfaction with support has been found to be the best predictor of depression in comparison to other operationalizations of support (e.g., perceived availability, use of support; Fiore, Coppel, Becker, & Cox, 1986), so perhaps the relationship with marital adjustment would have been higher in the latter study if a satisfaction measure had been used (and is strong in this study because satisfaction was assessed).

Hypothesis 3. This hypothesis stated that depression in the postpartum would be inversely related to satisfaction with partner support in the postpartum. Both measures of postpartum depression (CES-D and EPDS) were significantly related to both relationship measures, in the predicted direction. The lower ratings of satisfaction and general marital quality were associated with increased depressive symptomatology in the postpartum. Ratings on the relationship variables during

pregnancy were also inversely related to depression in the postpartum. These results generally support the literature in that marital tension or dissatisfaction has been one of the variables most consistently associated with postpartum depression (Braverman & Roux, 1978; Gotlib, Whiffen, Wallace, & Mount, 1991; Kumar & Robson, 1984; Spangenberg & Pieters, 1991; Whiffen, 1988). Marital tension has also been consistently associated with the development of nonpostpartum depression (Barnett & Gotlib, 1988; Brown & Harris, 1978; Gotlib & Hooley, 1988). The direction of influence is, however, still in question. As O'Hara & Zekoski (1988) noted, since many studies have examined marital discord and depression concurrently, it is difficult to conclude that marital tension plays a causal role in the onset of a postpartum disorder. Several prospective studies have found a relationship between marital tension prior to birth and subsequent postpartum depression (Gotlib et al., 1991; Kumar & Robson, 1984; Watson, Elliot, Rugg, & Brough, 1984), suggesting that a poor marital relationship may be an antecedent rather than or in addition to a concomitant of depression in the postpartum. The present study provides evidence that marital tension both precedes and accompanies PPD symptoms.

Hypothesis 4. It was postulated that there would be a relationship between prepartum sociotropy and autonomy and postpartum depression levels. Further, the cognitive schemata, by definition, were expected to be relatively stable characteristics of personal functioning, and to therefore remain stable across time. The results confirmed the latter expectation. Prenatal sociotropy and autonomy scores were highly correlated with their respective postnatal scores, and the differences across time were not significantly different from zero. The former expectation was also confirmed: higher depression levels were associated with higher levels of sociotropy and autonomy, both prior to and after the birth of the baby. Although Robins and Block (1988) previously reported a correlation between depressive

symptoms and sociotropy using Beck's (et al., 1983) Sociotropy-Autonomy Scale (SAS), similar results were not obtained with autonomy. These authors noted several measurement problems with the autonomy scale, and in light of those shortcomings they developed the Personal Style Inventory, used in the current study. In the present study, the finding that both subtypes are correlated with depressive symptom levels, as expected, provides some support for concurrent and predictive validity of the scale.

Hypothesis 5. It was predicted that difficulty of infant temperament would be related to level of depressive symptoms. While the findings corroborated the hypothesis and the results of previous studies (e.g., Cutrona & Troutman, 1986; Ventura & Stevenson, 1986; Whiffen, 1988; Whiffen, 1990), there are several possible interpretations of the correlation. First, it is possible that the association between infant temperament and depression is a result of depressive bias, such that women who are more depressed have more negatively distorted perceptions of their child as difficult (Griest, Wells, & Forehand, 1979; Hopkins, Campbell, & Marcus, 1987). A second interpretation, from studies which used objective behavioral (rather than perception) measures of infant temperament, and/or used independent observer ratings in conjunction with parental ratings, suggests that the association between the two variables may not merely be distortion on the part of the mother (Cutrona & Troutman, 1986; Whiffen & Kimball, 1985). In line with theses latter studies, which also found a relationship between maternal depression and infant temperament, Conrad and Hammen (1989) recently found that depressed mothers may be more accurate than nondepressed mothers in perceptions of their child's behavior. A more difficult infant would be more demanding on the mother, and could therefore contribute to more depressive symptomatology. Regardless of the direction of the relationship, the mother's rating of the child as difficult to care for may be clinically significant since it has been

found to predict subsequent mother-child conflict (Lee & Bates, 1985). It is significant that the current study used a behaviorally-based measure of infant temperament, not a perception questionnaire. In other words, mothers were not simply asked to rate whether their infants were happy/content or fussy/difficult. Rather, they rated the babies on specific behavioral dimensions which were then scored and categorized as easy to difficult. Thus, it is less likely that depressive distortion can fully explain the relationship between infant temperament and depression.

Hypothesis 6. It was predicted that all three of the empirically-identified variables (cognitive style, quality of relationship, infant-related stress) would significantly contribute to the prediction of postpartum depressive symptoms, based on regression analyses. There was partial support for the hypothesis, such that quality of the relationship and infant-related stress were each significantly related to PPD (as measured by the CES-D), whereas cognitive vulnerability was not. However, the best predictor of postpartum depression, was depression in the prepartum. Those reporting higher levels of depressive symptoms before the baby was born were more likely to remain depressed following childbirth. This factor accounted for almost two-thirds of the total explained variance. Other investigations have reported similar findings (e.g., Gotlib et al., 1989; Gotlib et al., 1991; O'Hara, Neunaber, & Zekoski, 1984; O'Hara, Schlechte, Lewis & Varner, 1991) using the Beck Depression Inventory (BDI) to assess depressive symptomatology.

Using the CES-D and EPDS, which measure primarily affective and cognitive symptoms, the present study confirmed that depressive symptoms during pregnancy predict depressive symptoms experienced later in the postpartum. In fact, almost half of the women who scored above the cutoff on the CES-D in the postpartum had been depressed in the prepartum as well. There will be further discussion in a later section

regarding the implications for identifying and understanding postpartum depression given the strong influence of depression during pregnancy.

Even after the level of prenatal depressive symptomatology was considered, the couple relationship and infant-related stress factors still contributed significantly to the explained variance of postpartum depressive symptoms. However, neither sociotropy or autonomy, the cognitive vulnerability subtypes, were significant predictors of postpartum depression. Even though they were associated with postpartum depression at a univariate level, they were not sufficiently related at a multivariate level when other variables were also taken into account. The lack of main effects for sociotropy and autonomy is not inconsistent with a diathesis-stress model, which focuses on interactive effects between diatheses and stressors. Specifically, the theory postulates that the impact of the diathesis occurs in the presence of a relevant stressor, which may serve to "activate" the vulnerability factor, thereby resulting in depression (Beck, 1983). Thus, cognitive vulnerability by itself need not contribute to the prediction of depression, and may be considered a necessary but not sufficient factor (Monroe & Simons, 1991). Instead, as discussed with the next hypothesis, it appears that cognitive style is associated with the contribution of stress to postpartum depressive symptoms, only under conditions of high stress (i.e., difficult infant temperament).

As noted earlier, a problematic couple relationship has consistently been found to be related to postpartum depression. That finding was also confirmed here. Quality of the marital relationship in the postpartum accounted for almost a quarter of the total explained variance of postpartum depression, even after the contribution of prenatal depression was considered. Women who were unhappy with their partners reported higher depressive symptomatology.

While it is clear that marital tension or dissatisfaction is related to postpartum depression, the direction of the relationship

cannot be readily determined. Numerous descriptive studies have reported strong assocations between marital tension and postpartum depression (Braverman & Roux, 1978; Gotlib et al., 1991; Kumar & Robson, 1984; O'Hara, Rehm, & Campbell, 1983; O'Hara, 1986; Paykel et al., 1980; Whiffen, 1988). Depression may distort or bias perception such that those who are depressed perceive less support from their partners, and report more dissatisfaction and problematic marital functioning. However, at least two studies have reported that the spouse's ratings on a marital adjustment measure were highly related to the depressed partner's ratings of their relationship, suggesting that the depressed individual may not simply be distorting the state of the couple relationship. Gotlib and Whiffen (1989b) found that couples in which one spouse was depressed (psychiatric patient) did not differ from each other in their reported satisfaction with the marriage. O'Hara (1985) reported a strong correlation between husbands' and wives' marital adjustment ratings both during pregnancy and the postpartum.

In the current study, postpartum ratings of quality of the relationship significantly contributed to the explained variance of postpartum depressive symptoms. In contrast to findings by other studies which suggested that marital dysfunction could well be an antecedent of depression (Kumar & Robson, 1984; O'Hara, 1986; Whiffen, 1988), prenatal ratings of the couple relationship were not predictive. However, when women who were depressed in the postpartum (i.e., scored above the cutoff of 16 on the CES-D) were directly compared with those who were not, prenatal ratings of marital adjustment differentiated the postpartum depressed and nondepressed groups. Similarly, Gotlib et al. (1991) found that women who were diagnosed as depressed in the postpartum reported significantly lower levels of marital satisfaction during pregnancy.

Finally, infant-related stress, as measured by infant temperament, was significantly related to postpartum depressive symptomatology, even

after prenatal depression and quality of the couple relationship were taken into account. This finding confirms previous research which found that the nature of the baby did impact on the mother's adjustment and depression in the postpartum (Cutrona & Troutman, 1986; Whiffen, 1988). In addition, it lends support to other research which has found a relationship between childcare-related stressors (including health problems of infant, feeding and sleeping difficulties) and postpartum depression (Cutrona, 1983; Hopkins, Campbell, & Marcus, 1987; O'Hara, Neunaber, & Zekoski, 1984). Although collateral information about the infant was not obtained in this study in addition to maternal ratings, Cutrona and Troutman (1986), who used home observations as well as the same maternal rating scale, found the information to be strongly correlated, directly accounting for 30% of the variance in postpartum depressive symptomatology.

How would a difficult infant impact on a new mother, contributing to depressive symptoms? At a day-to-day level, the mother may experience a greater work load and perhaps more frustration dealing with a fussy, demanding infant. Both objective and subjective caregiver burden may be heightened by self-blame for the child's nature, concern regarding the mother's skill as a parent, or feelings of personal rejection (e.g., Cutrona & Troutman, 1986; Gruen, 1990). Women with temperamentally difficult infants may curtail their social connections and activites, both because of practical problems (it may be difficult to get a babysitter who can cope with the infant) and because they may be reluctant to go places or visit with people, knowing that it will be a struggle for the baby to adapt.

Infant-related stress, while significant, only accounted for a small proportion of the total explained variance of postpartum depressive symptoms (approximately 10%). The variable was chosen because it was a putative source of postpartum stress. Monroe and Simons (1991), in their review of diathesis-stress research, have

highlighted the need for more precision regarding the particular type of stressors that are hypothesized to interact with a diathesis. However, the stressor definition may have been too narrow. Other stressors or life events were not taken into acccount during the measurement period. Certainly, the pregnancy and postpartum adjustment process was not taking place within a vacuum. Additional stressors may have been impacting on the couple throughout this time which affected their relationship and/or the mother's depressive symptomatology. O'Hara and his colleagues (1986; O'Hara, Rehm & Campbell, 1982; O'Hara, Rehm & Campbell, 1983) found that postpartum depressed subjects experienced more stressful life events in the early postpartum period than did nondepressed subjects. Their results indicated that the best predictor of postpartum depression, once prepartum levels were controlled, was the occurrence of stressful life events in pregnancy and following childbirth. Similarly, Paykel et al. (1980) assessed nondepressed and depressed women at six weeks postpartum. The depressed group reported significantly more stressful life events occurring during pregnancy and in the postpartum which were undesirable or had a negative impact, than did the nondepressed group. In the only study to assess both life events and infant-care stressors (Whiffen, 1988), life events did not significantly contribute to postpartum depressive symptoms, whereas difficulty of infant care was a significant contributor.

Hypothesis 7. This hypothesis provided the most direct test of the diathesis-stress model. It predicted that the interaction of cognitive style and infant-related stress would contribute significantly to the explained variance of postpartum depressive symptoms. More specifically, hypothesis 7 postulated that women with high levels of sociotropy or autonomy who had temperamentally difficult babies would be more likely to report high levels of depressive symptomatology. The expected relationship was found for the interaction of sociotropy and infant temperament, but not for the interaction of autonomy and infant

temperament.

Sociotropy, when assessed prenatally, appeared to modify the impact of stress on depressive symptoms. For mothers with infants who were easy-going and good-natured (low stress), sociotropy level did not influence the level of depressive symptoms. On the other hand, for mothers with difficult and fussy infants (high stress), sociotropy was postively related to the level of depression. Highly sociotropic women were most depressed; women scoring low on this cognitive style were least depressed. This finding is consistent with research in the general depression literature, which has more readily found support for the diathesis-stress model using sociotropy than autonomy (e.g., Hammen, Marks, Mayol, & deMayo, 1985; Segal, Shaw, & Vella, 1989; Zuroff & Mongrain, 1987). The results underscore the utility of considering interactive rather than solely main effects models. O'Hara et al. (1991) also reported significant vulnerability x stress interactions that were predictive of both postpartum depressive symptomatology and diagnosed depression. They did not measure the same cognitive factors that were used in this study, but they did find childcare-related stressors to be one component of several of the significant interactions.

It is of note that the diathesis-stress relationship was supported with a context-specific measure of stress in the present study. A more general measure of stress may have "diluted" the interaction, as is cautioned by Monroe and Simons (1991). One possible reason for the modest contribution of the interaction variable may be the low base rate of temperamentally difficult babies. Thomas and Chess (1977) have estimated that approximately 10% of babies could be categorized as having difficult temperaments. Infants in this study were assessed on a spectrum from easy to difficult, with only 11% rated in the highest or 'difficult' category. A restricted range on the 'high' end of the stress variable could result in smaller correlations and thus lead to

lower beta weights for that variable in the regression analyses. Thus, this finding may be a conservative estimate of the interaction. Perhaps if the sample had selectively included more women with difficult babies (for example, 50% of women with difficult babies rather than 11%), there may have been a more powerful interaction effect than was found in this study. In other words, for the many women who did not have temperamentally difficult babies the interaction of stress and cognitive style did not have much impact on depression; for those women who did have difficult babies, the interaction would be quite relevant.

The lack of support for the diathesis-stress interaction with autonomy may be related to congruence or even methodological and conceptual issues. On the assumption that only a "congruent" stressor can activate a diathesis, the interaction may not have been significant if the postpartum situation was not construed as congruent with the autonomy diathesis. The experience of dealing with a difficult infant may have been interpreted more as an interpersonal than an achievement-related stressor, and thus impacted on the highly sociotropic rather than highly autonomous individuals.

With regard to psychometric issues, Robins and Jacobson (1987) have contended that inconsistent findings regarding the cognitive styles of sociotropy and autonomy have not been the fault of the theory, but stem from psychometric problems with the measurement tools, and with the autonomy concept in particular. As a result, they developed the Personal Style Inventory (PSI), used in this study, to address reliability and validity problems. Even using the PSI though, the Autonomy scale had a lower reliability and was less stable across time relative to the Sociotropy scale.

The lack of results using the autonomy subtype may be due to a more basic conceptual problem. Autonomy, as it is currently defined, may not adequately be capturing the essential elements of a depressogenic cognitive style. Blaney and Kutcher (1991) concluded in

their comparison of depressogenic subtypes that the autonomy subscale from Beck's Sociotropy Autonomy Scale (SAS) was more an inverse measure of dependency than a measure of self-critical tendencies. Hewitt and his colleagues (Hewitt & Dyck, 1986; Hewitt & Flett, 1990; 1991a; 1991b; 1993; Hewitt & Genest, 1990; Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991) have proposed and operationalized an alternative personality type, perfectionism, and identified three dimensions, self-oriented, other-oriented, and socially prescribed perfectionism. They have reported some very promising findings regarding the relationship of perfectionism to both clinical and subclinical levels of depression. For example, in a recent test of a diathesis-stress model using perfectionism as the vulnerability factor, they reported that self-oriented perfectionism interacted uniquely with achievement-oriented stressors to predict depression in a clincial sample (Hewitt & Flett, 1993).

Overall, the findings clearly provide support for a diathesis-stress model in which the cognitive style of sociotropy serves as the diathesis. It is not clear whether the stressor was perceived as congruent with the depressogenic subtype, thus support for a congruency or specific vulnerability model was not conclusive. One could contend that a temperamentally difficult infant would challenge the sociotropic individual's sense of self-worth if she perceived the baby as rejecting or felt a lack of connection (e.g., "We do not get along well"; "I do not know or understand my baby"). The autonomous mother could perceive the same situation as a challenge to her competency and as a failure to be "good" in her role as mother. Future research should assess not only the actual stressors, but also the participants' evaluations of them (Dyck & Stewart, 1991), in order to evaluate congruency effects.

Hypothesis 8. Hypothesis 8 postulated a three-way interaction among cognitive style, infant-related stress, and the quality of the couple relationship, and specified the direction of the relationship among the variables involved. It was anticipated that the relationship

variable might serve as a buffer for the impact of the diathesis-stress interaction on postpartum depressive symptoms. In other words, if a highly sociotropic woman who had a temperamentally difficult infant provided a positive rating of the relationship with her partner, this perceived marital support would serve to buffer the impact of an otherwise deleterious combination. Although this line of reasoning is suggested by the literature (Carveth & Gottlieb, 1979; Cohen & Hoberman, 1983; Crnic et al., 1983; Wilcox, 1981), the present study did not provide evidence for it. Specifically, the three-way interaction did not account for a significant portion of the variance. All the variance in postpartum depressive symptoms that could be explained by the variables was already accounted for by the main and second-order (two-way interaction) effects. Cutrona (1984), in her study of 71 first-time mothers, assessed the impact of several components of social support, childcare-related stress, and their interactions on depression eight weeks following childbirth. She was also unable to confirm a buffering hypothesis of support; she reported that support appeared most strongly linked to depression at lower levels of stress.

Alternatively, the relationship variable might not be moderating the diathesis-stress interaction per se. It might, instead, act as a vulnerability factor to moderate the impact of stress, or serve as a stressor itself, moderated by the cognitive style of sociotropy. These possibilities were also assessed. Regression analyses that included interactions of sociotropy with quality of the couple relationship and infant-related stress with quality of the couple relationship did not confirm these alternative explanations. Although marital adjustment did not appear to directly buffer the impact of infant-related stress on postpartum depressive symptoms, it was associated with lower depressive symptoms in the postpartum. The mechanism by which it is related remains somewhat unclear. Cohen and Wills (1985) concluded in their review of physical and psychological symptoms, that functional support

moderated the effects of stress by facilitating coping abilities. Cutrona and Troutman (1986) found that perceived social support (not limited to partner support) impacted on postpartum depressive symptoms indirectly by enhancing parental self-confidence. Although these are reasonable hypotheses, they require additional empirical confirmation before one can confidently endorse them.

Demographic, Infant Care, and Change-in-Routine Factors

In addition to the main etiological variables that were discussed in the research hypotheses, there were a number of other variables found in post hoc analyses to contribute to the understanding of who develops postpartum depressive symptoms. They consisted of demographic variables, variables related to infant care, and daily adjustments or changes following childbirth.

Not surprisingly, there were few demographic variables associated with postpartum depression in this study. The sample was selected to be relatively homogeneous and free of major risk factors such as single or adolescent parenthood (Troutman & Cutrona, 1990). Findings have been inconsistent across postpartum studies for variables such as age, education, income level, marital status and parity (cf. Hopkins, Marcus & Campbell, 1984; O'Hara & Zekoski, 1988), although sample sizes and measurement differences make comparative interpretation of these studies difficult. In this study, finances were related to depression level, both during pregnancy and the postpartum. The lower the income level during pregnancy, the higher the reported depressive symptoms both before and after birth. A related variable that was associated with postpartum depression was the occupation status of the partner. If he was working less than full-time (e.g., part-time, unemployed, student), the woman was more likely to report depressive symptoms in the postpartum. Several other studies have also found financial factors to be related to depression in the postpartum (Playfair & Gowers, 1981;

Whiffen & Kimball, 1985). Stein et al. (1991) reported that low family income contributed to the prediction of postpartum depression, and they calculated that this risk factor increased the chances of developing PPD by a factor of three. Similarly, Gotlib et al. (1989) found work status to be the only demographic variable associated with depression following childbirth. Campbell and Cohn (1991) reported that husbands of depressed women had lower occupation levels than husbands of nondepressed women. The women in the present study were typically better educated, and had higher family income levels and higher occupation levels than average. Even though the lower end of the occupational status and income range was truncated or underrepresented, a relationship with depression was still noted. The association may have even been stronger with more variability in this financial factor.

It is certainly understandable that financial concerns would be relevant in anticipation of this life change. In addition to the extra cost of having a child, there would be some lost income following childbirth, and perhaps for an extended period of time. Most of the women in this study (88%) were working before they had the baby, but many were going to cut back on their hours or not return at all after the baby was born. If the family income was low to begin with, and the husband was also working less than full-time, finances could certainly be a source of stress for the couple, and contribute to adjustment problems during pregnancy and in the postpartum.

Marital status, while not significantly related to postpartum depression, was associated with the couple relationship measures. Marital status, in this case, means married or living together, since all the subjects were required to be in a stable relationship in order to participate in the study. Quite a high proportion of subjects were married (92%) as compared to living together (8%), although other studies have reported similar rates (e.g., Gotlib et al. 1991; Pfost, Stevens & Lum, 1990). Those women who were living common-law with

their partners were more dissatisfied with the support from their partners both during pregnancy and following birth. As well, they rated the quality of the couple relationship in the postpartum as lower than did those who were married. Perhaps commitment in the form of a tangible agreement like marriage is important or becomes an issue when adding a child to the family "equation". It may be another source of strain or tension for the couple. Research on both general and postpartum depression has found marital status to be a protective factor against depression, in that those who are married are less likely to become depressed than those who are single (Barnes, Currie & Segal, 1988; Feggetter & Gath, 1981; Pfost, Stevens, & Lum, 1990).

Of the delivery and infant care variables that were assessed in this study, none were found to be associated with depression, in contrast to other research (Campbell & Cohn, 1991; Hopkins, Campbell & Marcus, 1987; O'Hara, Neunaber & Zekoski, 1984). There was no difference in reported depressive symptoms for those women who delivered vaginally versus caesarian section (the latter is typically rated as a delivery complication - e.g., O'Hara, Rehm & Campbell, 1982). There was also no difference in depression levels for those women who were breast-feeding as compared to those women who were not. Finally, while there was a trend for women whose babies required neonatal hospital care to report higher levels of postpartum depressive symptoms than women whose babies did not need such intervention, the difference was not significant. The measures used in this study may not have been sensitive enough, and did not include a wide range of possible problems. There is a low rate of occurrence for many such problems. For example, only 10% of the women in this study delivered by caesarian section, and only 10% of the babies required additional medical care following birth. Other studies which have assessed these factors using more comprehensive scales that weight and/or add up the number of pregnancy/labour/infant health complications tend to find a relationship with depression

(Cutrona, 1983; O'Hara, Neunaber, & Zekoski, 1984; O'Hara et al., 1991). As well, these studies assessed depression earlier in the postpartum than the sixteen week measurement point used here. The lack of a relationship in this study suggests that these complications in and of themselves do not have an impact on later depression; they may have an additive or compounding effect, or have an effect at an earlier point in the postpartum. Elliot et al. (1984), who measured adjustment and depression at several points during the first postnatal year, also failed to find any association between depressive symptoms and labour/delivery complications.

Although it is acknowledged that having a baby is a major life event, there has been little assessment of the day-to-day experiences of the couple, and how the "new routine" might impact on the new mother's adjustment in the postpartum. Thus, the time each parent spent with the baby, the mother's ratings of her partner's helpfulness for both household chores and infant care, and the mother's time away from the baby, either for individual or couple activities, were all evaluated. The mother was generally the primary caretaker, as indicated by the number of hours she spent with the baby (mean=11 hours/day) compared to the number of hours the partner was with the baby (mean=2 hours/day). The number of hours alone with the baby was not associated with depression, nor were the number of couple or individual activities that the woman was involved in (without the baby). However, the woman's reported satisfaction with the number of couple or individual activities without the baby was strongly associated with depression. The more dissatisfaction reported by the woman on either measure, the higher her depressive symptom score. When the couple and individual satisfaction scales were combined, the association was even stronger. As well, the new mother's rating of her partner's helpfulness with the baby was significantly related to depressive symptomatology, whereas ratings of the partner's helpfulness with household chores was not associated with

depression.

Time spent away from the baby appears to make an important contribution to adjustment for mothers. It may be especially relevant for first-time mothers, who would not have the prior experience to anticipate the actual time and energy demands of an infant, or who may expect that they could continue doing things the way they had before the baby was born. The actual number of times that the mother could "get away" was less important than was the level of satisfaction associated with activities away from the baby. The shift from a nonparent to a parent lifestyle involves many changes. In the early postpartum months, it is often more difficult to pursue interests, activities or hobbies outside the home, especially if one is the primary caretaker. The parent now has to make arrangements to leave, and cannot just go when he or she wishes. Affonso and Arizmendi (1986) found that 94% of their sample of postpartum women reported that they had less time for social activity, and approximately 60% of the sample felt isolated from other adults. Those variables were also significantly related to depressive symptom scores. The problem may be compounded if the new mother judges her partner to be of little help with the baby, either because he seems to be uninterested or less capable with the infant. Such women may have few real or perceived opportunities to take "time off", which could lead to growing resentment toward the new lifestyle, and thus contribute to adjustment difficulties.

When the combined 'time away from baby' satisfaction measure was assessed at a multivariate level (added to the diathesis-stress model), it contributed 14% to the total explained variance of postpartum depressive symptoms, increasing the explained variance to 44%. Thus, almost half of the variance in depressive symptoms was explained by prepartum depressive symptoms, satisfaction with time away from the baby, quality of the couple relationship, infant-related stress, and the sociotropy - infant temperament interaction. Having quality time away

from the baby was more strongly associated with postpartum depression than was marital adjustment (quality of couple relationship), and contributed more than a quarter of the explained variance. Marital adjustment and satisfaction with time away from the baby were moderately correlated. The opportunity to spend some time away from the baby may depend, to some extent, on the quality of the couple relationship and the support of the partner. For example, if the mother wanted to do something as an individual she may need to rely on her partner to look after the baby while she is gone. Twenty-two percent of the women in this study reported that they had no one else who could help with childcare (besides the partner), and 35% reported that they had one additional individual they could call upon for some help or relief. Thus, almost half the sample had little or no option besides the partner to obtain some "off-duty" time. As well, if the mother wanted some quality time as a couple, without the baby, she needed her partner's cooperation to schedule that as well. The importance of this factor suggests that preparation for the postpartum which may take the form of arranging satisfying activities unrelated to caregiving could be helpful in adjusting to this life event.

It would be useful in future research to assess couples' expectations during pregnancy regarding the ways their lives will change on a daily basis in the first months after the baby is born. Studies which have looked at expectations of the infant prepartum and actual infant behavior postpartum have found the comparison to be relevant to postpartum adjustment (Graff, Dyck, & Schallow, 1991) and have found infant expectations to predict postpartum depression (Whiffen, 1988). It may also be useful to identify "satisfying activities" (away from the baby) and those factors which contribute to individual differences in satisfaction. Although 'time away from baby' did not appear to buffer the sociotropy x infant temperament interaction, the possibility that it moderates the impact of stress on depression should be followed up.

Context Specificity: General versus Childbearing Measures

One of the questions considered in this study was whether 'context-specific' measures, relative to general measures of spousal support and depression, would be more sensitive or useful in assessing adjustment difficulties in the postpartum. O'Hara and Zekoski (1988), in their review of the postpartum literature, advocated for the use of measures that were "sensitive and specific" to the puerperium (p. 54). The Edinburgh Postnatal Depression Inventory (Cox, Holden, & Sagovsky, 1987) and the Support Behavior Inventory (Brown, 1986), developed specifically for pregnancy/postpartum assessment, were used in the present study and may be compared with more general measures of depression (CES-D) and the couple relationship (DAS), respectively, by parallel analyses.

The depression measures (CES-D and EPDS) were highly correlated both in pregnancy and the postpartum. Generally, measures that were correlated with one of the depression scales were also associated with the other one, but the correlations were typically stronger with the CES-D than the EPDS. The rates of postpartum depression (number scoring above the cutoff) were similar, but the CES-D indicated a higher prevalence of depression during pregnancy (23%) than did the EPDS (14%). This difference may be related to the presence of somatic items on the CES-D. While there is less emphasis on these symptoms of depression in the CES-D than in the Beck Depresssion Inventory, the CES-D scale has more somatic items relative to the EPDS, and may therefore reflect some somatic changes (e.g., sleep, energy and appetite) associated with pregnancy.

On the other hand, when the CES-D was used as the criterion variable, the regression results corresponded to theoretical expectations more closely than they did when the EPDS was used as the criterion variable. Although evidence for the diathesis-stress model

would have been stronger if supported by both measures of depression, the results could also suggest a validity issue for the EPDS. Variables previously identified as significantly related to depression (both symptoms and syndrome) in other studies were confirmed at a multivariate level using the CES-D but not the EPDS (e.g., infant temperament).

The two partner relationship measures were highly correlated, especially in the postpartum. Generally speaking, measures that were correlated with one of the relationship scales were also typically associated with the other one. It is interesting to note, however, that the general couple relationship scale (DAS) was more strongly associated with the general depression measure (CES-D), and the specific pregnancy/postpartum support measure (SBI) was more strongly associated with the specific depression measure (EPDS) at the multivariate level. In other words, postpartum depressive symptoms (as measured by the CES-D) were better predicted by the DAS scores than the SBI scores, whereas EPDS depressive symptoms were more strongly associated with SBI scores than with DAS scores.

Overall, it appears that the scales developed specifically for the childbearing period captured less variance than the scales "borrowed" from the general depression literature. However, more direct and comprehensive comparisons of the scales are needed to determine if one measure is more valid than the other.

Depression Levels: Postpartum Depression or Childbearing Adjustment?

Although there is some variability across studies in the prevalence of depression at a symptom level, it has typically been reported in the 20-30% range. For example, Gotlib et al. (1989) reported that 26% of their subjects scored above the cutoff on the Beck Depresssion Inventory during pregnancy, with 25% scoring above the cutoff in the postpartum. Similarly, Atkinson and Rickel (1984), also using the BDI, found that 29% of first-time mothers were classified as

depressed (scored above the cutoff) in the prepartum, and 26% were depressed in the postpartum. In the present study, the prevalence rate for depression based on the CES-D (i.e., scoring above the cutoff of 16) during pregnancy was 23% (n=39), whereas only 14% (n=24) scored in the depressed range at sixteen weeks postpartum. The latter prevalence rate was somewhat lower than expected for a symptom measure of postpartum depression, and was somewhat lower than the rate of general depression for women in an urban Canadian sample (prevalence = 19% based on the CES-D; Barnes, Currie, & Segal, 1988). The EPDS prenatal and postnatal rates were also lower, at 14% and 13% respectively.

There are a number of possible reasons for the lower postpartum rates in the present study. The CES-D scale used in this study has less emphasis on somatic symptoms than does the Beck Depression Inventory, used in most other studies. Women experiencing normal physiological changes (such as sleep and appetite changes) in the postpartum would score higher on the BDI simply by endorsing these somatic items. Thus, the latter scale may overestimate the number of women who are depressed following childbirth, particularly in the early postpartum weeks. One recent postpartum study which used the CES-D reported postpartum depression rates that are comparable to the level found here (Campbell & Cohn, 1991 - postpartum prevalence rate of 13%). Others who have looked at responses on a subset of the BDI somatic items found that women reported the highest symptom levels in pregnancy and the early postpartum, with declining scores later in the postpartum (Huffman, Lamour, Bryan, & Pederson, 1990; O;Hara et al., 1990).

O'Hara's and Huffman's findings suggest that an alternative, or perhaps a compounding factor for the lower postpartum rate is the time of measurement. Depressive symptoms were assessed four months after the birth of the baby. Most of the studies reporting symptom prevalence rates in the 20-30% range measured depression between four and nine weeks following childbirth (e.g., Atkinson & Rickel, 1984; Cutrona &

Troutman, 1986; Gotlib et al., 1989). Kumar and Robson (1984) suggested that depression may peak in the first six to nine weeks postpartum. O'Hara, Neunaber, and Zekoski (1984) found that the number of women scoring in the depressed range on the BDI dropped by half after six weeks postpartum (from 23.9% to 11.2%). Gjerdingen, Froberg, and Kochevar (1991), using a symptom checklist, noted that depressive symptoms increased from pregnancy to the sixth week postpartum, and then declined after that. This decrease in rates during the later postpartum period may be related to an improvement in somatic symptoms, thereby improving depression scores. Perhaps the postpartum rates are lower in the present study because of the later measurement point (at four months). At that time, somatic symptoms which may inflate depressive scores, appear to have decreased considerably.

A further issue is raised by the finding that more women scored in the depressed range in the prepartum than in the postpartum. As well, the mean depression score was lower after birth than prior to it. The higher pregnancy rates relative to postpartum depression rates might be considered an artifact of pregnancy-associated somatic symptoms that attenuate over time. However, other researchers have reported similar results for both depressive symptoms (Fink & Windt, 1984; Gjerdingen et al., 1991; Greene et al., 1991; Huffman et al., 1990; O'Hara, Neunaber, & Zekoski, 1984) and depression diagnosis rates (Gotlib et al., 1989; Gotlib et al., 1991). These findings indicate that the concept of postpartum depression needs to be broadened to incorporate pregnancy as well; that is, adjustment to the entire childbearing period or life change of starting a family. Measurement during pregnancy should distinguish between depression and pregnancy-related somatic changes.

The findings from this study, which support other research indicating that depressive symptoms are higher in pregnancy than the postpartum suggest the possibility of a higher base rate of depression in pregnancy. In one of the only postpartum studies to use a control

group, O'Hara et al. (1990) compared pregnant women with nonpregnant acquaintances on measures of depression and friend/family relationships. There was no difference between childbearing and nonchildbearing women in the rate of diagnosed depression for either the pre- or postpartum, nor was there any difference for childbearing women between the rate of depression during pregnancy and the postpartum rate. However, childbearing women did report significantly higher levels of depressive symptomatology in the second and third trimester of pregnancy, and at three weeks postpartum than did their nonchildbearing counterparts. Further, depressive symptoms were highest for the childbearing group during pregnancy, at the third trimester measurement point. The childbearing group also endorsed more somatic symptoms on the BDI than did the nonchildbearing group, both in pregnancy and the postpartum. However, another measure of depression (SCL-90 depression subscale) that included few somatic symptoms indicated the same pattern of response, suggesting that somatic symptoms alone may not account for the higher depression scores by the childbearing group during pregnancy.

While there may be a higher base rate of depressive symptoms during pregnancy than the postpartum, an alternative explanation is that women are more anxious during pregnancy than the postpartum, and the symptom measure of depression may be tapping this anxiety or general distress. Women may experience some relief from worry once the baby has been born and health concerns (for example) for themselves or the infant have been proven groundless. Few studies in the postpartum literature have directly compared anxiety before and after childbirth. Pitt (1968) reported that, for his sample of 305 childbearing women, scores on his screening measure of anxiety and depression dropped significantly after the baby was born. Most postpartum research has assessed instead the relationship between prenatal anxiety and postnatal depression, and several studies reported that high prenatal levels of anxiety were associated with depression after childbirth (Bridge et al., 1985;

Dalton, 1971; Hayworth et al., 1980; Tod, 1964). Research from the general depression literature has noted significant overlap, particularly at a subsyndromal level and for self-report measures, between scales of anxiety and depression (e.g., Clark & Watson, 1991; Hiller, Zaudig, & von Bose, 1989). Feldman (1993) reported that, based on a confirmatory factor analysis of several self-report measures used in clinical and nonclinical samples, anxiety and depression loaded primarily on a general distress factor, and did not clearly differentiate on anxiety and depression factors. Thus, women in this study may have been experiencing general distress or anxiety during pregnancy which was alleviated once the baby was born.

One additional interpretation of the lower postnatal rate relative to the prenatal rate of depression involves motivation for reporting symptoms. Perhaps the lower postpartum rates of depressive symptomatology reflect a reluctance to acknowledge symptoms or difficulties. First-time mothers in particular, for whom childcare is a new experience, may consider any depressive symptoms to be part of the normal course of postpartum adjustment (Atkinson & Rickel, 1983; Welburn, 1980). Alternatively, they may be reluctant to report any negative feelings in the postpartum, due to social expectations and pressures to be content and happy during such a 'joyous event' (Handford, 1985). This latter possibility is suggested by results which indicate that there is a low rate of help-seeking among postpartum women despite the continued confirmation that a significant proportion experience depression in the weeks and months after childbirth (e.g., Cox, 1983; Kendall, 1985; Pitt, 1968; Richards, 1990; Robinson & Young, 1982). As an aside, this low rate is interesting in the context of the "time away from baby" results. Perhaps those mothers who experience the highest levels of depression are also least likely to seek help because it may require arranging "time away", which they have difficulty doing.

Related to the greater number of women who are depressed in

pregnancy versus the postpartum is the issue of who becomes depressed at those times. In this study, those who were depressed during pregnancy had lower incomes, higher levels of sociotropy and autonomy, and lower ratings of marital adjustment and support from their partners than the women who were not depressed. Depressed women did not differ from nondepressed women in age, education level, or length of the couple relationship.

These prenatal characteristics did not differentiate the women who were depressed in the postpartum from those who were not depressed at the four month postnatal point, with the exception of one variable (prenatal marital adjustment). None of the demographic variables differentiated postpartum depressed and nondepressed subjects. However, depressed women had higher levels of depressive symptomatology during pregnancy as well, and reported lower marital adjustment during pregnancy and following childbirth. In comparison to the nondepressed subjects, they were less satisfied with their time away from the baby, both in individual and couple activities.

Gotlib and his colleagues (1989; 1991), in their studies of women with diagnosed depression, also found that some demographic variables were relevant to depression in pregnancy and they were not significantly related to postpartum depression. They similarly reported that women depressed in the postpartum had higher prepartum depression scores, and lower marital satisfaction scores, both during pregnancy and following childbirth. These findings suggest that at both a symptom and a syndrome level, those who are depressed in pregnancy are at risk for depression in the postpartum. In addition, marital adjustment difficulties appear to precede postpartum depression, as well as occur in conjunction with higher depressive symptoms.

Use of the term 'postpartum depression' links vulnerability to depression with the time following childbirth and indirectly minimizes the depression associated with pregnancy. Thus, focusing on this one

point of the childbearing experience, the postpartum, may be inaccurate when trying to understand depression as it is related to this life change. While some individuals do become depressed after the baby is born, many women are distressed during pregnancy. While it may be that depressions which develop at these different points have different contributory factors, as noted earlier, it might be more fruitful to take a broader perspective and consider the experiences across pregnancy and the postpartum in more global terms, such as a maternal depression (Chalmers & Chalmers, 1986) or an adjustment disorder (Whiffen, 1991). The life event or change begins sooner than the event of the birth and the resulting demands of the infant, thus depression could well begin before the birth too and not necessarily be a different 'type' of depression than that arising later in the change process (i.e., the postpartum). Perhaps there are different kinds of stressors specific to this life change that arise throughout the entire childbearing (prepartum/postpartum) period to which women are differentially sensitive. More controlled studies and studies which begin before pregnancy are needed to track the process. Also, given that subsyndromal levels of depression are often associated with elevated anxiety, it would be important to measure anxiety as well as depression. Ideally, a prospective study which followed couples and a control comparison group from a childless stage, through pregnancy, and to the postpartum, with careful assessment of depression and more general distress symptoms would provide important baseline information in order to sort out the factors impacting on depression.

Limitations of the Study

There are several qualifications that need to be made with regard to the interpretation of the results of this study. First, the sample of first-time mothers was a fairly homogeneous and healthy group with few risk factors for depression. That is, they were generally middle

class, well-educated working women in stable relationships. The factors that contributed to the development or maintenance of depressive symptoms for these women may not be the same or as relevant for single mothers or those with fewer financial and personal resources.

Second, this study was based on an assessment of depressive symptoms. While the reporting of these symptoms indicates real and substantial distress for many of the subjects, their experience is not synonymous with the syndrome of clinical depression. Concordance rates between symptom and syndrome measures of depression are only moderate (e.g., Campbell & Cohn, 1991; Harris et al., 1989; Murray & Cox, 1990), and those factors which contribute to the understanding of depressive symptoms in the childbearing period may not generalize to the syndrome of clinical depression. While some of the findings in this study did converge with results from studies of clinical depression, O'Hara and colleagues (O'Hara, Neunaber, & Zekoski, 1984; O'Hara et al., 1991) have found little overlap between the factors that account for high levels of symptomatology and those that account for clinical depression. In addition, caution must be taken when interpeting the 'depressed' versus 'nondepressed' group comparisons in pregnancy and the postpartum. The depression scale (CES-D) is not a dichotomous measure of the presence/absence of clinical depression, but rather is a continuous variable from which the two groups were formed based on a cutoff score that corresponds moderately to diagnosis of depression. In other words, individuals were classified as depressed because of higher levels of depressive symptomatology and grouped on that basis, using a scale that is continuous in nature.

Third, the primary measures of depressive symptoms, cognitive style, the couple relationship, and infant temperament were essentially self-report, without collateral ratings or observer corroboration. The value of self-report information should not be underestimated: the new mother's ratings reflect her perceptions and experience of her

situation, which is more relevant for her behavior than 'objective' ratings. The drawback is that when the self-report variables are related, it is more difficult to determine to what extent the interdependence reflects a self-report bias versus the 'true' relations among those factors.

Finally, the main analyses were associational in nature, which leaves issues of causality unclear. Use of a prospective design can provide some support for direction of influence. However, many of the variables that were measured prospectively in the prepartum were not relevant to postpartum depression, and the variables that were associated with high depressive symptomatology in this study were primarily assessed concurrently, raising the possibility of depressive distortion, for example.

Conclusions and Directions for Future Research

To summarize, the psychosocial factors examined here accounted for almost half of the variability in postpartum depressive symptoms. The results confirmed that women with lower incomes and partners who are employed less than full-time are at risk for depression. Women experiencing depression during pregnancy are also more likely to report higher levels of depressive symptomatology several weeks after childbirth. Problems in the couple relationship contributed significantly but modestly to higher depressive symptom levels in the postpartum. The most important findings suggested that women with a highly sociotropic (dependent) schema were more likely to experience depression if their babies were also demanding and difficult. Finally, the new mother's satisfaction with her ability to spend some time away from the baby was an important factor in adjustment to the new role of parent.

The diathesis (cognitive vulnerability) - stressor (infant temperament) interaction only accounted for a modest portion of the

total explained variance, suggesting that the model, using this particular vulnerability and stressor combination, does not encompass all the relevant factors impacting on depression. Perhaps a more adequate test of the model requires an expansion of the definition of both the diathesis and stressor to include several possible vulnerability factors and several relevant or congruent stressors, in an additive model. In other words, if an individual has several risk factors or vulnerabilites for depression (e.g., cognitive style, relationship tensions, previous depression experiences, low income), does that make her more prone to depression (a) regardless of the stressors she experiences, (b) only if she experiences stressors that are congruent with or relevant to those stressors (e.g., low income and increased expenses because of baby), or (c) if any one stressor is of significant magnitude or impact by itself?

The findings have implications for prevention of depression, or at least prevention of the distress of depressive symptoms, particularly during this life change. Physicians and prenatal instructors have the most widespread and consistent contact with expectant parents. Physicians could screen for and monitor those with risk factors for postnatal adjustment difficulties. Since prenatal depression and symptoms have consistently emerged as the strongest predictor of postpartum depression, that factor alone may be useful to monitor by repeated symptom assessment during pregnancy.

Prenatal instructors and physicians can also play a preparatory role, discussing with expectant parents the changes that occur after birth, not only at a physical level, but also at a social and personal level. So much, if not all, of prenatal class content focuses on the time leading up to the birth, and there is little discussion of the realities of childcare once the baby has been delivered. One or two classes should be scheduled as part of the childbirth education "package" in order to deal with postpartum concerns and parenting

questions. Day-to-day changes that can be anticipated as well as the importance of maintaining some time for adult and couple activities away from the baby should emphasized in the context of postnatal education classes.

The public health nurse can also play an important role in monitoring the possible development of depression once the baby is born. In the follow-up visit (usually within the first two weeks after hospital discharge), the nurse could briefly assess the temperament of the infant in addition to its general physical health. He or she may also be able to assess the mother's support network in general and the couple relationship in particular, as well as discuss with the new mother the importance of time for herself. Women judged to be at risk for depression because of a demanding baby or a disengaged father, for example, could be followed-up briefly by telephone. These steps could go a long way to identifying those at risk or even minimizing the occurrence of depressive symptoms and adjustment difficulties.

Finally, the findings in this study provide some promising support for the diathesis-stress model, and the role of a sociotropic style or cogntive schema. Even though the stress component was defined quite narrowly and depression was assessed at a symptom level, the expected interaction was found, and the relationship between the diathesis and stressor was in the predicted direction. In addition, these results affirm a growing consensus that one does not have to "re-invent the wheel" when investigating depression in this context. Postpartum depression does not appear to be distinctly different from nonpostpartum depression to the extent that it warrants a separate diagnostic typology (Whiffen, 1992). Many of the measures used in the general depression literature were applicable here in the postpartum context. The use of these general measures aids in comparability of findings across different contexts. As well, many of the same factors that were found to be significant in this study of postpartum depression are also

associated with general depression, including factors such as lower income, relationship problems, stress, and dependent cognitive schema. The similarities imply that the treatment approaches used for general depression could be effective in the postpartum situation as well. There have been no studies to assess the efficacy of 'generic' depression therapy with postpartum women, although two case studies did report the successful use of nonpostpartum depression methods with postpartum patients (assertiveness training - Philipps, 1986; marital therapy - Krause & Redman, 1986).

While depression occurring during the pre- and postpartum may not be qualitatively different from general depression, this period is still a useful context in which to study the disorder. A nonpathological group of women (for whom depression occurs at a higher rate than men) is experiencing a life change, and one can track the process to examine what factors are relevant in coping with the change, the nature of the stressors involved, who is sensitive to what type of stressor, and what is involved in remission. If it is the case, as Monroe and Simons (1991) suggest, that the diatheses for depression are prevalent in the population and stressors that are capable of eliciting depression occur relatively infrequently, then the childbearing period can be used to more carefully assess which stressor variables are of greatest impact (create the greatest adjustment difficulties). More generally, the childbearing period can be used heuristically to test alternative diathesis-stress models.

Future studies should be designed as prospective ones which begin before pregnancy in order to follow women across the entire adjustment period; that is from pregnancy through the postpartum. Depression and relevant contributory factors should be assessed using scales that are valid in the general depression research. Further, multiple measures of adjustment (e.g., anxiety, distress, depression) should be incorporated to better define the woman's experience. The 'satisfaction with time

away from baby' variable deserves more attention. Follow-up research can determine whether it may act as a buffer for infant-related stressors, and whether its effect generalizes to diagnosed depression. In addition, there is a noticable lack of control groups (i.e., nonchildbearing subjects) in postpartum depression studies, and yet that comparison group is important in order to assess base rates and normative experiences across pregnancy and the postpartum. Finally, most research in the area has focused primarily on married or cohabitating women. Marital difficulties have consistently been found to be related to the development of depression. Perhaps including more single women in postpartum research and directly comparing the adjustment of women with and without partners would further clarify the role of the couple relationship.

Overall, prospective work in the childbearing period provides a promising context for depression studies, as well as furthering information about adjustment to that life change. Research needs to continue to take into account the multitude of psychological, social, and other factors that are involved in the onset or maintenance of depression, and continue to assess ways they may act together to result in depression.

REFERENCES

Abramson, L., Seligman, M. & Teasdale, J. (1978). Learned helplessness in humans: Critique and reformulation. Journal of Abnormal Psychology, 87, 49-74.

Affonso, D. & Arizmendi, T. (1986). Disturbances in post-partum adaptation and depressive symptomatology. Journal of Psychosomatic Obstetrics and Gynaecology, 5, 15-32.

Affonso, D. & Domino, G. (1984). Postpartum depression: A review. Birth, 11(4), 231-235.

Alder, E. & Cox, J. (1983). Breast feeding and post-natal depression. Journal of Psychosomatic Research, 27(2), 139-144.

Atkinson, K. & Rickel, A. (1983). Depression in women: The postpartum experience. Issues in Mental Health Nursing, 5(1-4), 197-218.

Atkinson, K. & Rickel, A. (1984). Postpartum depression in primiparous parents. Journal of Abnormal Psychology, 93(1), 115-119.

Barnes, G., Currie, R., & Segall, A. (1988). Symptoms of depression in a Canadian urban sample. Canadian Journal of Psychiatry, 33, 386-393.

Barnett, P. & Gotlib, I. (1988). Psychosocial functioning and depression: Distinguishing among antecedents, concomitants, and consequences. Psychological Bulletin, 104(1), 97-126.

Bates, J., Freeland, C., & Lounsbury, M. (1979). Measurement of infant difficultness. Child Development, 50, 794-803.

Beck, A.T. (1983). Cognitive therapies of depression: New perspectives. In P. Clayton & J. Barrett (Eds.) Treatment of depression: Old controversies and new approaches. New York: Raven Press. (pp 265-284).

Beck, A., Epstein, N., Harrison, R., & Emery, G. (1983). Development of Sociotropy-Autonomy Scale: A measure of personality factors in psychopathology. Unpublished manuscript. University of Pennsylvania.

Beck. A., Rush, J., Shaw, B., & Emery, G. (1979). Cognitive Therapy of

Depression. New York: The Guilford Press.

Belsky, J. (1981). Early human experience: A family perspective. Developmental Psychology, 17, 3-23.

Blaney, P. & Kutcher, G. (1991). Measures of depressive dimensions: Are they interchangeable? Journal of Personality Assessment, 56, 502-512.

Blatt, S. (1974). Levels of object representation in anaclitic and introjective depression. Psychoanalytic Study of the Child, 29, 107-157.

Blatt, S., D'Aflitti, J., & Quinlan, D. (1976). Experiences of depression in normal young adults. Journal of Abnormal Psychology, 85, 383-389.

Blatt, S., Quinlan, D., Chevron, E., McDonald, C. & Zuroff, D. (1982). Dependency and self-criticism: Psychological dimensions of depression. Journal of Consulting and Clinical Psychology, 59, 113-124.

Bradley, C., Ross, S., & Warnyca, J. (1983). A prospective study of mothers' attitudes and feelings following ceasarean and vaginal births. Birth, 10(2), 79-83.

Brandon, S. (1982). Depression after childbirth. British Medical Journal, 284, 613-614.

Braverman, J. & Roux, F. (1978). Screening for the patient at risk for postpartum depression. Obstetrics and Gynecology, 52(6), 731-736.

Brewer, J. (1982). The Revised Infant Temperament Questionnaire. In S. Humenick (Ed.) Analysis of current assessment strategies in the health care of young children and child-bearing families. Norwalk, CT: Appleton Century Crofts.

Bridge, L., Little, B., Hayworth, J., Dewhurst, J., & Priest, R. (1985). Psychometric ante-natal predictors of post-natal depressed mood. Journal of Psychosomatic Research, 29(3), 325-331.

Broussard, E. & Hartner, M. (1970). Maternal perception of the neonate

as related to development. Child Psychiatry and Human Developmental, 1(1), 16-25.

Brown, M.A. (1986). Marital support during pregnancy. Journal of Gynecological and Newborn Nursing, Nov-Dec, 475-483.

Brown, G.W. & Harris, T. (1978). Social origins of depression. London: Free Press.

Buesching, D., Glasser, M., & Frate, D. (1986). Progression of depression in the prenatal and postpartum periods. Women and Health, 11(2), 61-78.

Campbell, S. & Cohn, J. (1991). Prevalence and correlates of postpartum depression in first-time mothers. Journal of Abnormal Psychology, 100(4), 594-599.

Carey, W. (1970). A simplified method for measuring infant temperament. The Journal of Pediatrics, 77(2), 188-194.

Carey, W. (1972). Measuring infant temperament. The Journal of Pediatrics, 79, 414.

Carey, W. & McDevitt, S. (1978). Revision of the Infant Temperament Questionnaire. Pediatrics, 61(5), 735-738.

Carver, C. & Gaines, J. (1987). Optimism, pessimism, and postpartum depression. Cognitive Therapy and Research, 11(4), 449-462.

Carveth, W. & Gottlieb, B. (1979). The measurement of social support and its relation to stress. Canadian Journal of Behavioral Science, 11, 179-188.

Chalmers, B. & Chalmers, B. (1986). Post-partum depression: A revised perspective. Journal of Psychosomatic Obstetrics and Gynecology, 5(2), 93-105.

Chess, S. & Thomas, A. (1986). Temperament in Clinical Practice. New York: The Guilford Press.

Clark, L. & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. Journal of Abnormal Psychology, 100(3), 316-336.

Cobb, S. (1976). Social support as a moderator of life stress. Psychosomatic Medicine, 38, 300-314.

Coghill, S., Caplan, H., Alexandra, H., Robson, K., & Kumar, R. (1986). Impact of maternal postnatal depression on cognitive development of young children. British Medical Journal, 292, 1165-1167.

Cohen, J. & Cohen, P. (1975). Applied multiple regression/correlation analysis for the behavioral sciences. (1st ed.). Hillsdale, N.J.: Lawrence Erlbaum Associates, Publishers.

Cohen, J. & Cohen, P. (1983). Applied multiple regression/correlation analysis for the behavioral sciences. (2nd ed.). Hillsdale, N.J.: Lawrence Erlbaum Associates, Publishers.

Cohen, S. & Hoberman, H. (1983). Positive events and social support as buffers of life change stress. Journal of Applied Social Psychology, 13, 99-125.

Cohen, S. & Wills, T. (1985). Stress, social support, and the buffering hypothesis. Psychological Bulletin, 98, 310-357.

Conrad, M. & Hammen, C. (1989). Role of maternal depression in perceptions of child maladjustment. Journal of Consulting and Clinical Psychology, 57, 663-667.

Cox, J. (1983). Clinical and research aspects of post-natal depression. Journal of Psychosomatic Obstetrics and Gynaecology, 2 46-53.

Cox, J. (1986). Postnatal depression - A guide for health professionals. Edinburgh: Churchill Livingstone.

Cox, J., Holden, J., & Sagovsky, R. (1987). Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. British Journal of Psychiatry, 150, 782-786.

Crnic, K., Greenberg, M., Ragozin, A., Robinson, N., & Basham, R. (1983). Effects of stress and social support on mothers and premature and full-term infants. Child Development, 54, 209-217.

Cutrona, C. (1982). Nonpsychotic postpartum depression: A review of recent research. Clinical Psychology Review, 2, 487-503.

Cutrona, C. (1983). Causal attributions and perinatal depression. Journal of Abnormal Psychology, 92(2), 161-172.

Cutrona, C. (1984). Social support and stress in transition to parenthood. Journal of Abnormal Psychology, 93(4), 378-390.

Cutrona, C. & Troutman, B. (1986). Social support, infant temperament, and parenting self-efficacy: A mediational model of postpartum depression. Child Development, 57, 1507-1518.

Dalton, K. (1971). Prospective study into puerperal depression. British Journal of Psychiatry, 118, 689-692.

Dalton, K. (1980). Depression after childbirth. Oxford: Oxford University Press.

Dean, C. & Kendall, R. (1981). The symptomatology of puerperal illnesses. British Journal of Psychiatry, 139, 128-133.

Digdon, N. & Gotlib, I. (1985). Developmental considerations in the study of childhood depression. Developmental Reviews, 5, 162-199.

Dillman, D. (1978). Mail and telephone surveys: The Total Design Method. New York: Wiley-Interscience.

Dillman, D. (1983). Mail and other self-adminstered questionnaires. In P. Rossi, J. Wright, & A. Anderson (Eds). Handbook of Survey Research. New York: Academic Press.

Dyck, M. & Stewart, B. (1991). Cognitive vulnerability to depression. Journal of Cognitive Therapy: An International Quarterly, 5(2), 115-129.

Elliott, S., Watson, J., & Brough, D. (1985). Transition to parenthood by British couples. Journal of Reproductive and Infant Psychology, 3, 28-39.

Elliott, S., Anderson, M., Brough, D., Watson, J., & Rugg, A. (1984). Relationship between obstetric outcome and psychological measures in pregnancy and the postnatal year. Journal of Reproductive and Infant Psychology, 2, 18-32.

Farrar, D. & Glauber, R. (1967). Multicollinearity in regression

analyses: The problem revisited. Review of Economics and Statistics, 49, 92-107.

Feggetter, P. & Gath. D. (1981). Non-psychotic psychiatric disorders in women one year after childbirth. Journal of Psychosomatic Research, 25, 369-372.

Feldman, L. (1993). Distinguishing depression and anxiety in self report: Evidence from confirmatory factor analysis on nonclinical and clinical samples. Journal of Consulting and Clinical Psychology. In press.

Field, T., Sandberg, D., Garcia, R., Vega-Lahr, N., Goldstein, S., & Guy, L. (1985). Pregnancy problems, postpartum depression, and early mother-infant interactions. Developmental Psychology, 21(6), 1152-1156.

Fink, R. & Windt, A. (1984). Depression during the prepartum and postpartum period. Birth Psychology Bulletin, 5(2), 1-22.

Fiore, J., Coppel, D., Becker, J., & Cox, G. (1986). Social support as a multifaceted concept: Examination of important dimensions for adjustment. American Journal of Community Psychology, 14(1), 93-111.

Fleming, A., Ruble, D., Flett, G., & Shaul, D. (1986). Postpartum adjustment in first-time mothers: effects of mood on maternal responsiveness. Presented at Canadian Psychological Association convention, Toronto.

Freund, R.J. & Littell, R.C. (1986). SAS system for regression. Cary, N.C.: SAS Institute Inc.

Gard, P., Handley, S., Parsons, A. & Waldron, G. (1986). A multivariate investigation of postpartum mental disturbance. British Journal of Psychiatry, 148, 567-575.

Gennaro, S. (1988). Postpartal anxiety and depression in mothers of term and preterm infants. Nursing Research, 37(2), 82-85.

Gjerdingen, D., Frober, D., & Kochevar, L. (1991). Changes in women's mental and phsyical health from pregnancy through six months

postpartum. The Journal of Family Practice, 32(2), 161-166.

Gotlib, I. & Hooley, J. (1988). Depression and marital functioning: Current status and future directions. In S. Duck (Ed.), Handbook of personal relationships: Theory, research and interventions. (pp. 543-570). Chichester, United Kingdom: Wiley.

Gotlib, I. & Lee, C. (1990). Children of depressed mothers: A review and directions for future research. In C.D. McCann & N.S. Endler (Eds.) Depression: New directions in theory, research, and practice. (pp. 187-208). Toronto: Wall & Emerson.

Gotlib, I. & Whiffen, V. (1989). Depression and marital functioning: An examination of specificity and gender differences. Journal of Abnormal Psychology, 98(1), 23-30.

Gotlib, I., Whiffen, V., Wallace, P. & Mount, J. (1991). Prospective investigation of postpartum depression: Factors involved in onset and recovery. Journal of Abnormal Psychology, 100(2), 122-132.

Gotlib, I., Whiffen, V., Mount, J., Milne, K., & Cordy, N. (1989). Prevalence rates and demographic characteristics associated with depression in pregnancy and the postpartum. Journal of Consulting and Clinical Psychology, 57(2), 269-274.

Gordon, R. & Gordon, K. (1959). Social factors in the prediction and treatment of emotional disorders of pregnancy. American Journal of Obstetrics and Gynecology, 77, 1074-1083.

Graff, L. (1989). Collinearity in multiple regression. Unpublished paper, University of Manitoba, Winnipeg, MB.

Graff, L., Dyck, D., & Schallow, J. (1991). Predicting postpartum depressive symptoms: A structural modelling analysis. Perceptual and Motor Skills, 73, 1137-1138.

Greene, S., Nugent, K., Wieczorek-Deering, D., O'Mahony, P., & Graham, R. (1991). The patterning of depressive symptoms in a sample of first-time mothers. The Irish Journal of Psychology, 12(2), 263-275.

Griest, D., Wells, K. & Forehand, R. (1979). An examination of predictors of maternal perceptions of maladjustment in clinic-referred children. Journal of Abnormal Behavior, 88, 277-281.

Gruen, D. (1990). Postpartum depression: A debilitating yet often unassessed problem. Health and Social Work, 15(4), 261-270.

Haaga, D., Dyck, M., & Ernst, D. (1991). Empirical status of cognitive theory of depression. Psychological Bulletin, 11(2), 215-236.

Halbreich, U. & Endicott, J. (1981). Possible involvement of endorphin withdrawal or imbalance in specific premenstrual syndromes and postpartum depression. Medical Hypotheses, 8, 1045-1058.

Hammen, C., Ellicott, A., & Gitlin, M. (1989). Vulnerability to specific life events and prediction of course of disorder in unipolar depressed patients. Canadian Journal of Behavioral Science, 21(4), 377-389.

Hammen, C., Marks, T., Mayol, A., & deMayo, R. (1985). Depressive self-schemas, life stress, and vulnerability to depression. Journal of Abnormal Psychology, 94(3), 308-319.

Handford, P. (1985). Postpartum depression: What is it, what helps? Canadian Nurse, January, 30-33.

Handley, S., Dunn, T., Waldron, G., & Baker, J. (1980). Tryptophan, cortisol, and puerperal mood. British Journal of Psychiatry, 136, 498-508.

Harris, B. (1980). Prospective trial of L-tryptophan in maternity blues. British Journal of Psychiatry, 137, 233-235.

Harris, B. (1981). 'Maternity blues' in East African clinic attenders. Archives of General Psychiatry, 38, 1293-1295.

Harris, B., Huckle, P., Thomas, R., Johns, S., & Fung, H. (1989). The use of rating scales to identify post-natal depression. British Journal of Psychiatry, 154, 813-817.

Harris, R. (1985). A Primer of Multivariate Statistics. 2nd ed. Orlando: Academic Press, Inc.

Hayworth, J., Little, B., Carter, S., Raptopoulos, P., Priest, R., & Sandler, M. (1980). A predictive study of post-partum depression: Some predisposing characteristics. British Journal of Medical Psychology, 53, 161-167.

Herzog, A. & Detre, T. (1976). Psychotic reactions associated with childbirth. Diseases of the Nervous System, 37, 229-235.

Hewitt, P. & Dyck, D. (1986). Perfectionism, stress, and vulnerability to depression. Cognitive Therapy and Research, 10(1), 137-142.

Hewitt, P. & Flett, G. (1990). Perfectionism and depression: A multidimensional analysis. Journal of Social Behavior and Personality, 5(5), 423-438.

Hewitt, P. & Flett, G. (1991a). Dimensions of perfectionism in unipolar depression. Journal of Abnormal Psychology, 11(1), 98-101.

Hewitt, P. & Flett, G. (1991b). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. Journal of Personality and Social Psychology, 60(3), 456-470.

Hewitt, P. & Flett, G. (1993). Dimensions of perfectionism, daily stress, and depression: A test of the specific vulnerability hypothesis. Journal of Abnormal Psychology, 102(1), 1-8.

Hewitt, P. & Genest, M. (1990). The ideal self: Schematic processing of perfectionistic content in dysphoric students. Journal of Personality and Social Psychology, 59(4), 802-808.

Hewitt, P., Flett, G., Turnbull-Donovan, W., & Mikail, S. (1991). The multidimensional perfectionism scale: Reliability, validity, and psychometric properties in psychiatric samples. Psychological Assessment: A Journal of Consulting and Clinical Psychology, 3(3), 464-468.

Hiller, W., Zaudig, M. & von Bose, M. (1989). The overlap between depression and anxiety on different levels of psychopathology. Journal of Affective Disorders, 16, 223-231.

Hopkins, J., Campbell, S., & Marcus, M. (1987). Role of infant-related stressors in postpartum depression. Journal of Abnormal Psychology, 96(3), 237-241.

Hopkins, J., Marcus, M., & Campbell, S. (1984). Postpartum depression: A critical review. Psychological Bulletin, 95(3), 498-515.

Huffman, L., Lamour, M., Bryan, Y. & Pederson, F. (1990). Depressive symptomatology during pregnancy and the postpartum period: Is the Beck Depression Inventory applicable? Journal of Reproductive and Infant Psychology, 8, 87-97.

Kendall, R. (1985). Emotional and physical factors in the genesis of puerperal moods, C. (1976). A possible relationship between anxiety in pregnancy and puerperal depression. Journal of Psychosomatic Research, 20, 605-610.

Kleinbaum, D., Kupper, L., & Muller, K. (1988). Applied regression analysis and other multivariable methods. Boston: PWS-Kent Publishing Co.

Krause, M. & Redman, E. (1986). Postpartum depression: An interactional view. Journal of Marital and Family Therapy, 12, 63-74.

Kumar, R. & Robson, K. (1984). A prospective study of emotional disorders in childbearing women. British Journal of Psychiatry, 144, 35-47.

Lee, C. & Bates, J. (1985). Mother-child interaction at age two years and perceived difficult infant temperament. Child Development, 56, 1314-1325.

Melges, F. (1968). Postpartum psychiatric syndromes. Psychosomatic Medicine, 30, 95-108.

Meltzer, E. & Kumar, R. (1985). Puerperal mental illness, clinical features and classification. British Journal of Psychiatry, 147, 647-654.

Merikangas, K. (1984). Divorce and assortative mating among depressed patients. American Journal of Psychiatry, 141, 74-76.

Metalsky, G., Halberstadt, L., & Abramson, L. (1987). Vulnerability to depressive mood reactions: Toward a more powerful test of the diathesis-stress and causal mediation components of the reformulated theory of depression. Journal of Personality and Social Psychology, 52(2), 386-393.

Metz, A., Stump, K., Cowen, P., Elliot, J., Gelder, M., & Grahame-Smith, D. (1983). Changes in platelet a2-adrenoceptor binding post partum: Possible relations to maternity blues. The Lancet, 1, 4950-498.

Milliones, J. (1978). Relationship between perceived child temperament and maternal behaviors. Child Development, 49, 1255-1257.

Monroe, S. & Simons, A. (1991). Diathesis-stress theories in the context of life stress research: Implications for depressive disorders. Psychological Bulletin, 110(3), 406-425.

Morsbach, G. & Gordon, R. (1984). The relationship between 'maternity blues' and symptoms of peurperal (atypical) depression six to eight weeks after childbirth. Psychologia, 27, 171-175.

Muller, C. (1985). On the nosology of post-partum psychoses. Psychopathology, 18, 181-184.

Murray, D. & Cox, J. (1990). Screening for depression during pregnancy with the Edinburgh Depression Scale (EPDS). Journal of Reproductive and Infant Psychology, 8 99-107.

Murray, L. & Carothers, A. (1990). The validation of the Edinburgh Postnatal Depression Scale on a community sample. British Journal of Psychiatry, 157, 288-290.

Mustard, C. (November, 1992). The utilization of prenatal care and birthweight outcome in Winnipeg, 1987-88. Manitoba Centre for Health Policy and Evaluation. Report 92.11.

Neter, J. & Wasserman, W. (1974). Applied linear statistical models: Regression, analysis of variance, and experimental designs. Homewood, Ill.: R.D. Irwin.

Neugebauer, R. (1983). Rate of depression in the puerperium. British

Journal of Psychiatry, 143, 421-422.

Nixon, D. (1985). The etiology and treatment of postpartum depressive disorders. International Journal of Women's Studies, 8(2), 140-148.

Nott, P., Franklin, M., Armitage, C., & Gelder, M. (1976). Hormonal changes and mood in the peurperium. British Journal of Psychiatry, 128, 379-383.

Oberklaid, F. (1979). Letter. Medical Journal of Australia, 2, 486-487.

O'Hara, M. (August, 1984). Current issues in research on postpartum depression. Paper presented at the annual convention of the American Psychological Association, Toronto.

O'Hara, M. (1985). Depression and marital adjustment during pregnancy and after delivery. The American Journal of Family Therapy, 13(4), 49-55.

O'Hara, M. (1986). Social support, life events, and depression during pregnancy and the puerperium. Archives of General Psychiatry, 43, 569-573.

O'Hara, M. & Zekoski, E. (1988). Postpartum depression: A comprehensive review. In R. Kumar & I. Brockington (Eds.) Motherhood and mental illness 2: Causes and consequences. London: Wright. pp. 17-63.

O'Hara, M., Neunaber, D., & Zekoski, E. (1984). Prospective study of postpartum depression: Prevalence, course, and predictive factors. Journal of Abnormal Psychology, 93(2), 158-171.

O'Hara, M., Rehm, L., & Campbell, S. (1982). Predicting depressive symptomatology: Cognitive-behavioral models and postpartum depression. Journal of Abnormal Psychology, 91(6), 457-461.

O'Hara, M., Rehm, L., & Campbell, S. (1983). Postpartum depression: A role for social network and life stress variables. The Journal of Nervous and Mental Disease, 171(6), 336-341.

O'Hara, M., Schlechte, J., Lewis, D. & Varner, M. (1991). Controlled prospective study of postpartum mood disorders: Psychological, environmental, and hormonal variables. Journal of Abnormal

Psychology, 100(1), 63-73.

O'Hara, M., Zekoski, E., Philipps, L. & Wright, E. (1990). Controlled prospective study of postpartum mood disorders: Comparison of childbearing and nonchildbearing women. Journal of Abnormal Psychology, 99(1), 3-15.

Paykel, E., Emms, E., Fletcher, J., & Rassaby, E. (1980). Life events and social support in puerperal depression. British Journal of Psychiatry, 49, 1255-1257.

Persons, J. & Rao, P. (1985). Longitudinal study of cognitions, life events and depression in psychiatric inpatients. Journal of Abnormal Psychology, 94(1), 51-63.

Pfost, K., Stevens, M. & Lum, C. (1990). The relationship of demographic variables, antepartum depression, and stress to postpartum depression. Journal of Clinical Psychology, 46(5), 588-592.

Philipps, L. (1986). Behavior analysis of in a case of "postpartum depression". Journal of Behavioral Therapy and Experimental Psychiatry, 17, 101-104.

Pitt, B. (1968). "Atypical" depression following childbirth. British Journal of Psychiatry, 114, 1325-1335.

Pitt, B. (1973). Maternity blues. British Journal of Psychiatry, 122, 431-433.

Playfair, H. & Gowers, J. (1981). Depression following childbirth: a search for predictive signs. Journal of the Royal College of General Practitioners, 31, 201-208.

Protheroe, C. (1969). Puerperal psychosis: A long-term study 1927-1961. British Journal of Psychiatry, 115, 9-30.

Radloff, L. (1977). The CES-D scale: A self-report depression scale for research in the general population. Applied Psychological Measurement, 1(3), 385-401.

Raphael-Leff, J. (1985). Facilitators and regulators: Vulnerability to postnatal disturbance. Journal of Psychosomatic Obstetrics and

Gynecology, 4, 151-168.

Richards, J. (1990). Postnatal depression: A review of recent literature. British Journal of General Practice, 40, 472-476.

Robin, A. (1962). The psychological changes of normal parturition. Psychology Quarterly, 36, 129-150.

Robins, C. (1990). Congruence of personality and life events in depression. Journal of Abnormal Psychology, 99(4), 393-397.

Robins, C. & Block, P. (1988). Personal vulnerability, life events, and depressive symptoms: A test of a specific interactional model. Journal of Personality and Social Psychology, 54(5), 847-852.

Robins, C. & Block, P. (1989). Cognitive theories of depression viewed from a diathesis-stress perspective: Evaluations of the models of Beck and Abramson, Seligman, and Teasdale. Cognitive Therapy and Research, 13(4), 297-313.

Robins, C. & Jacobson, R. (November, 1987). Problems in assessing sociotropy and autonomy personality characteristics. Paper presented at the annual meeting of the Association for the Advancement of Behavior Therapy, Boston.

Robins, C. & Ladd, J. (1987). The Personal Style Inventory. Unpublished scale. Duke University Medical Centre.

Robins, C. & Luten, A. (1991). Sociotropy and autonomy: Differential patterns of clinical presentation in unipolar depression. Journal of Abnormal Psychology, 100(1), 74-77.

Robinson, S. & Young, J. (1982). Screening for depression and anxiety in the post-natal period: Acceptance or rejection of a subsequent treatment offer. Australian and New Zealand Journal of Psychiatry, 16(2), 47-51.

Searle, A. (1987). The effects of postnatal depression on mother-infant interaction. Australian Journal of Sex, Marriage, and the Family, 8(2), 79-88.

Segal, Z., Shaw, B., & Vella, D. (1989). Life stress and depression: A

test of the congruency hypothesis for life event content and depressive subtype. Canadian Journal of Behavioral Science, 21(4), 389-400.

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

Spangenberg, J. & Pieters, H. (1991). Factors related to postpartum depression. South African Journal of Psychology, 21(3), 159-165.

Stein, A., Cooper, P., Campbell, E., Day, A., & Altham, P. (1989) Social adversity and perinatal complications: Their relation to postnatal depression. British Medical Journal, 298(6680), 1073-1074.

Swallow, S. & Segal, Z. (1992). Probing significant interactions in clinical research employing multiple regression procedures. Presented at the Canadian Psychological Association annual convention, Quebec City, Quebec.

Tabachnick, B. & Fidell, L. (1989). 2nd Edn. Using Multivariate Statistics. New York: Harper & Row Publishers.

Thirkettle, J. & Knight, R. (1985). The psychological precipitants of transient postpartum depression: A review. Current Psychologial Research & Reviews, 4(2), 143-166.

Thomas, A. & Chess, S. (1977). Temperament and Development. New York: Brunner/Mazel Publishers.

Thomas, A., Chess, S., Birch, H., Hertzig, M. & Korn, S. (1963). Behavioral Individuality in Early Childhood. New York, NY: University Press.

Thuwe, I. (1974) Genetic factors in puerperal psychosis. British Journal of Psychiatry, 125, 378-385.

Tietjen, A. & Bradley, C. (1985). Social support and maternal psychosocial adjustment during the transition to parenthood. Canadian Journal of Behavioral Science, 17(2), 109-121.

Tod, E. (1964). Puerperal depression: A prospective epidemiological

study. The Lancet, 2, 1264-1266.

Troutman, B. & Cutrona, C. (1990). Nonpsychotic postpartum depression among adolescent mothers. Journal of Abnormal Psychology, 99, 69-78.

Tzelgov, J. & Henik, A. (1991). Suppression situations in psychological research: Definitions, implications, and applications. Psychological Bulletin, 109(3), 524-536.

Vandenbergh, R. (1980). Postpartum depression. Clinical Obstetrics and Gynecology, 23(4), 1105-1111.

Van Der Meer, Y., Loendersloot, E. & Van Loenen, A. (1984). Effect of high-dose progesterone in postpartum depression. Journal of Psychosomatic Obstetrics and Gynecology, 3(1), 67-68.

Ventura, J. & Stevenson, M. (1986). Relations of mothers' and fathers' reports of infant temperament, parents' psychological functioning, and family characteristics. Merrill-Palmer Quarterly, 32, 275-289.

Watson, J., Elliot, S., Rugg, A. & Brough, D. (1984). Psychiatric disorder in pregnancy and the first postnatal year. British Journal of Psychiatry, 144, 453-462.

Welburn, V. (1980). Postnatal depression. Glasgow: Williams /Collins Sons & Co. Ltd.

Whiffen, V. (1988). Vulnerability to postpartum depression: A prospective multivariate study. Journal of Abnormal Psychology, 97, 467-474.

Whiffen, V. (1990). Maternal depressed mood and perceptions of child temperament. The Journal of Genetic Psychology, 151(3), 329-339.

Whiffen, V. (1991). The comparison of postpartum with non-postpartum depression: A rose by any other name. Journal of Psychiatry and Neuroscience, 16(3), 160-165.

Whiffen, V. (1992). Is postpartum depression a distinct diagnosis? Clinical Psychology Review, 12(5), 485-508.

Whiffen, V. & Gotlib, I. (June, 1989a). Interactions of postpartum

depressed mothers and their infants. Presented at the Canadian Psychological Association convention, Halifax.

Whiffen, V. & Gotlib, I. (1989b). Depression and marital functioning: An examination of specificity and gender differences. Journal of Abnormal Psychology, 98(1), 23-30.

Whiffen, V. & Kimball, M. (1985). Dysphoric mood in the postpartum. Presented at Canadian Psychological Association convention, Halifax.

Wilcox, B. (1981). Social support, life stress, and psychological adjustment: A test of the buffering hypothesis. American Journal of Community Psychology, 9, 371-386.

Wilson, K. (1985). Mood changes after childbirth. British Journal of Psychiatry, 146, 215-216.

Wrate, R., Rooney, A., Thomas, P. & Cox, J. (1985). Postnatal depression and child development: A three-year follow-up study. British Journal of Psychiatry, 146, 622-627.

Yalom, I., Lunde, D., Moos, R., & Hamburg, D. (1968). "Postpartum blues" syndrome. Archives of General Psychiatry, 18, 16-27.

Zare-Parsi, M. & Hoffman, B. (1989). Postpartum mental disorders. Canada's Mental Health, 37(1), 13-16.

Zuroff, D. & Mongrain, M. (1987). Dependency and self-criticism: Vulnerability factors for depressive affective states. Journal of Abnormal Psychology, 96(1), 14-22.

Appendix A: Consent Form

PREDICTORS OF POSTPARTUM ADJUSTMENT

University of Manitoba
Department of Psychology

LESLEY GRAFF, M.A. and DENNIS DYCK, Ph.D.

I agree to participate in a study "Predictors of Postpartum Adjustment" conducted by Lesley Graff and Dennis Dyck, of the University of Manitoba. I understand that the study is investigating factors that influence adjustment to the birth of a child. I have been informed of the procedures to be used. I will be completing a questionnaire packet that asks about my attitudes, feelings and perceptions. I understand that I will be asked to complete another questionnaire packet once more, several weeks after the birth of my baby. I am aware that I am not obligated to take part in this additional stage of the study, even if I choose to participate at this time. Further, I understand that participation in this study is independent of the services provided in the prenatal classs, and my refusal to take part would in no way affect my status in the class. Finally, I understand that all my responses are confidential, and will only be identified by a number code.

SIGNATURE: _____

NAME: _____

TELEPHONE #: _____

BABY'S DUE DATE: _____

Appendix B: Demographic Questions - Prenatal Questionnaire

General Information

Please complete the following background questions. This information helps us to know, IN GENERAL, the range of people participating in this study.

Q-1 Age (please fill in): _____ YEARS

Q-2 Marital status (circle one): 0 MARRIED
1 LIVING TOGETHER AS MARRIED

Q-3 How long have you been living with your current partner? (specify # of months or years) _____.

Q-4 What is your education level? (circle highest level completed)

1 NO FORMAL EDUCATION
2 GRADE SCHOOL
3 SOME HIGH SCHOOL
4 HIGH SCHOOL GRADUATE
5 VOCATIONAL/TECHNICAL SCHOOL
6 SOME UNIVERSITY COURSES
7 UNIVERSITY GRADUATE
8 SOME GRADUATE WORK
9 GRADUATE DEGREE (e.g., M.A. Ph.D.)

Q-5 What is YOUR employment status? (circle number for you)

1 EMPLOYED FULL TIME
2 EMPLOYED PART TIME
3 FULL TIME HOMEMAKER
4 UNEMPLOYED
5 IN SCHOOL FULL TIME

PARTNER'S employment status? (circle number for partner)

1 EMPLOYED FULL TIME
2 EMPLOYED PART TIME
3 FULL TIME HOMEMAKER
4 UNEMPLOYED
5 IN SCHOOL FULL TIME

Q-6 If you work outside the home, what is your occupation? (give title): _____.

Q-7 Which of the following categories describes the total income of you and your partner in 1990, before taxes and deductions? (circle one only)

1 LESS THAN $15,000
2 $15,000 to $20,000
3 $21,000 to $25,000
4 $26,000 to $30,000
5 $31,000 to $35,000
6 $36,000 to $40,000
7 $41,000 to $50,000
8 $51,000 to $60,000
9 $61,000 to $70,000
10 $70,000 OR MORE

Q-8 Due date for birth of your baby: _____ (day/month/year)

Q-9 Is this a first pregnancy? (circle answer) YES NO

Q-10 Is this a planned pregnancy? (circle answer) YES NO

Q-11 Are you planning to return to work? (circle) YES NO

(circle answer) FULL TIME PART TIME

Q-12 If yes to Q-11, how soon after the baby is born do you plan to go back to work? (answer in months) _____.

Appendix C: Qualitative Postnatal Information

General Postnatal Information

Q-1 What was the birth date of your baby? _____.
(day/month/year)

Q-2 Are you breast-feeding your baby? (circle one) YES NO

Q-3 What type was the delivery? (circle one) VAGINAL CAESARIAN

Q-4 If you remember, what was your baby's APGAR score at one minute _____ and at five minutes _____ after birth? (out of 10)

Q-5 Did your baby spend any time in a special care nursery (e.g., neonatal intensive care unit or intermediate care)? (circle one) YES NO

Q-6 If YES to Q-5, how long was your baby in special care? (Specify number of days or months) _____.

Q-7 If YES to Q-5, why was your baby in special care? (Please describe problem briefly)

_____

_____

_____.

Q-8 How helpful is your partner in caring for the baby? (circle number)

1 NOT AT ALL 2 SOMEWHAT
3 VERY HELPFUL 4 EXTREMELY

Q-9 How helpful is your partner with household chores (e.g., dishes, laundry, cleaning, etc.)? (circle number)

1 NOT AT ALL 2 SOMEWHAT
3 VERY HELPFUL 4 EXTREMELY

Q-10 Is your partner now doing household chores (circle one) LESS THAN MORE THAN or ABOUT THE SAME as he was prior to the birth of the baby?

Q-11 On a typical day (24 hour period), how much time does your partner spend with the baby? (in approx. hours and minutes) _____.

Q-12 On a typical day (24 hour period), how much time do you spend with the baby? (in approx. hours and minutes) _____.

Q-13 What sources of support (besides partner) do you have in looking after the baby and managing household chores (e.g., relatives, friends, neighbors, nanny, etc.)? Please list below.

_____.

Q-14 How many times in the past month have you done activities outside the home by yourself (i.e., without the baby)? (approx. # of times) _____.

Q-15 Have you spent (circle one) MORE, LESS, or ABOUT THE SAME time in activities outside the home as you did before the baby was born?

Q-16 How satisfied are you with the amount of involvement you have in activities outside the home? (circle number)

1 VERY DISSATISFIED
2 DISSATISFIED
3 SOMEWHAT DISSATISFIED
4 SOMEWHAT SATISFIED
5 SATISFIED
6 VERY SATISFIED

Q-17 How many times in the past month have you and your partner spent time together outside the home without the baby? (approx. # of times) _____.

Q-18 Have you spent (circle one) MORE LESS or ABOUT THE SAME time with your partner in activities outside the home as you did before the baby was born?

Q-19 How satisfied are you with the amount of time you and your partner are involved together in activities outside the home? (circle one)

1 VERY DISSATISFIED
2 DISSATISFIED
3 SOMEWHAT DISSATISFIED
4 SOMEWHAT SATISFIED
5 SATISIFED
6 VERY SATISFIED

Appendix D: CES-D Scale

For each question, please CIRCLE the number of your answer which best describes how often you felt or behaved this way during THE PAST 7 DAYS.

Q-1 I was bothered by things that don't usually bother me.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-2 I did not feel like eating; my appetite was poor.

1 RARELY OR NONE OF THE TIME (LESS THAN A DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-3 I felt that I could not shake off the blues, even with help from my family or friends.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-4 I felt that I was just as good as other people.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-5 I had trouble keeping my mind on what I was doing.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-6 I felt depressed.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-7 I felt that everything I did was an effort.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-8 I felt hopeful about the future.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-9 I thought my life had been a failure.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-10 I felt fearful.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-11 My sleep was restless.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-12 I was happy.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-13 I talked less than usual.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-14 I felt lonely.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-15 People were unfriendly.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-16 I enjoyed life.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-17 I had crying spells.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-18 I felt sad.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-19 I felt that people disliked me.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A LITTLE OF THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE YS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Q-20 I could not get 'going'.

1 RARELY OR NONE OF THE TIME (LESS THAN 1 DAY)
2 SOME OR A F THE TIME (1-2 DAYS)
3 OCCASIONALLY OR A MODERATE AMOUNT OF THE TIME (3-4 DAYS)
4 MOST OR ALL OF THE TIME (5-7 DAYS)

Appendix E: Edinburgh Postnatal Depression Scale

Since you are soon having a baby*, we would like to know how you are feeling. Please CIRCLE the number of the answer which comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.
* Postnatal version: As you have recently had a baby, ...

Here is an example, already completed.

I have felt happy:

1 YES, ALL THE TIME
*2 YES, MOST OF THE TIME
3 NO, NOT VERY OFTEN
4 NO, NOT AT ALL

This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

IN THE PAST 7 DAYS:

Q-1 I have been able to laugh and see the funny side of things

1 AS MUCH AS I ALWAYS COULD
2 NOT QUITE SO MUCH NOW
3 DEFINITELY NOT SO MUCH NOW
4 NOT AT ALL

Q-2 I have looked forward with enjoyment to things

1 AS MUCH AS I EVER DID
2 RATHER LESS THAN I USED TO
3 DEFINITELY LESS THAN I USED TO
4 HARDLY AT ALL

Q-3 I have blamed myself unnecessarily when things went wrong

1 YES, MOST OF THE TIME
2 YES, SOME OF THE TIME
3 NO, NOT VERY OFTEN
4 NO, NEVER

Q-4 I have been anxious or worried for no good reason

1 NO, HARDLY AT ALL
2 HARDLY EVER
3 YES, SOMETIMES
4 YES, VERY OFTEN

Q-5 I have felt scared or panicky for no very good reason

1 YES, QUITE A LOT
2 YES, SOMETIMES
3 NO, NOT MUCH
4 NO, NOT AT ALL

Q-6 Things have been getting on top of me

1 YES, MOST OF THE TIME
2 YES, SOMETIMES I HAVEN'T BEEN COPING AS WELL AS USUAL
3 NO, MOST OF THE TIME I HAVE COPED QUITE WELL
4 NO, I HAVE BEEN COPING AS WELL AS EVER

Q-7 I have been so unhappy that I have had difficulty sleeping

1 YES, MOST OF THE TIME
2 YES, SOMETIMES
3 NOT VERY OFTEN
4 NO, NOT AT ALL

Q-8 I have felt sad or miserable

1 YES, MOST OF THE TIME
2 YES, QUITE OFTEN
3 NOT VERY OFTEN
4 NO, NOT AT ALL

Q-9 I have been so unhappy that I have been crying

1 YES, MOST OF THE TIME
2 YES, QUITE OFTEN
3 ONLY OCCASIONALLY
4 NO, NEVER

Q-10 The thought of harming myself has occurred to me

1 YES, QUITE OFTEN
2 SOMETIMES
3 HARDLY EVER
4 NEVER

Appendix F: Dyadic Adjustment Scale

Most persons have disagreements in their relationships. Please indicate below the approximate extent of agreement or disagreement between you and your partner for each item on the following list. (Please circle the number of your answer).

Use the following scale for Q-1 to Q-15:

ALWAYS AGREE 0	ALMOST ALWAYS DISAGREE 1	OCCA-SIONALLY DISAGREE 2	FRE-QUENTLY DISAGREE 3	ALMOST ALWAYS DISAGREE 4	ALWAYS AGREE 5

Q-1	Handling family finances	0	1	2	3	4	5
Q-2	matters of recreation	0	1	2	3	4	5
Q-3	religious matters	0	1	2	3	4	5
Q-4	demonstrations of affection	0	1	2	3	4	5
Q-5	friends	0	1	2	3	4	5
Q-6	sexual relations	0	1	2	3	4	5
Q-7	conventionality (correct or proper behavior)	0	1	2	3	4	5
Q-8	philosophy of life	0	1	2	3	4	5
Q-9	ways of dealing with parents or in-laws	0	1	2	3	4	5
Q-10	aims, goals and things believed important	0	1	2	3	4	5
Q-11	amount of time spent together	0	1	2	3	4	5
Q-12	making major decisions	0	1	2	3	4	5
Q-13	household tasks	0	1	2	3	4	5
Q-14	leisure time, interests and activities	0	1	2	3	4	5
Q-15	career decisions	0	1	2	3	4	5

Use the following scale for Q-16 to Q-22:

ALL OF THE TIME	MOST OF THE TIME	MORE OFTEN THAN NOT	OCCA-SIONALLY	RARELY	NEVER
0	1	2	3	4	5

Q-16	How often do you discuss or have you considered divorce, separation, or terminating your relationship?	0	1	2	3	4	5
Q-17	How often do you or your mate leave the house after a fight?	0	1	2	3	4	5
Q-18	In general, how often do you think that things between you and your partner are going well?	0	1	2	3	4	5
Q-19	Do you confide in you mate?	0	1	2	3	4	5
Q-20	Do you ever regret that you married (or live together)?	0	1	2	3	4	5
Q-22	How often do you and your mate "get on each other's nerves"?	0	1	2	3	4	5

		EVERY DAY	ALMOST EVERY DAY	OCCA-SIONALLY	RARELY	NEVER
Q-23	Do you kiss your mate?	0	1	2	3	4

		ALL OF THEM	MOST OF THEM	SOME OF THEM	VERY FEW OF THEM	NONE
Q-24	Do you and your mate engage in outside interests together?	0	1	2	3	4

How often would you say the following events occur between you and your mate:

(Use the following scale for Q-25 to Q-28):

NEVER	LESS THAN ONCE A MONTH	ONCE OR TWICE A MONTH	ONCE OR TWICE A WEEK	ONCE A DAY	MORE OFTEN
0	1	2	3	4	5

Q-25 have a stimulating exchange of ideas	0	1	2	3	4	5
Q-26 laugh together	0	1	2	3	4	5
Q-27 calmly discuss something	0	1	2	3	4	5
Q-28 work together on a project	0	1	2	3	4	5

These are some things about which couples sometimes agree and sometimes disagree. Indicate if either item below caused differences of opinions or were problems in your relationship in the last few weeks (circle answer):

Q-29 being too tired for sex	YES	NO
Q-30 not showing love	YES	NO

Q-31 The numbers on the following scale represent different degrees of happiness in your relationship. The middle point "happy" represents the degree of happiness of most relationships. Please circle the number 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

Q-32 Which of the following statements best describes how you feel about the future of your relationship? (circle one)

1 I WANT DESPERATELY FOR MY RELATIONSHIP TO SUCCEED AND WOULD GO TO ALMOST ANY LENGTH TO SEE THAT IT DOES.

2 I WANT VERY MUCH FOR MY RELATIONSHIP TO SUCCEED, AND WILL DO ALL I CAN TO SEE THAT IT DOES.

3 I WANT VERY MUCH FOR MY RELATIONSHIP TO SUCCEED, AND WILL DO MY FAIR SHARE TO SEE THAT IT DOES.

4 IT WOULD BE NICE IF MY RELATIONSHIP SUCCEEDED, BUT I CAN'T DO MUCH MORE THAN I AM DOING NOW TO HELP IT SUCCEED.

5 IT WOULD BE NICE IF MY RELATIONSHIP SUCCEEDED, BUT I REFUSE TO DO ANY MORE THAN I AM DOING NOW TO KEEP THE RELATIONSHIP GOING.

6 MY RELATIONSHIP CAN NEVER SUCCEED, AND THERE IS NO MORE THAT I CAN DO TO KEEP THE RELATIONSHIP GOING.

Appendix G: Support Behavior Inventory

Prenatal Version

We are interested in finding out the kinds of things that are helpful to expectant mothers during pregnancy. Below is a list of different things people do for each other. Please respond to each statement by answering 1) how SATISFIED you are with the amount your PARTNER/SPOUSE does each of these things; and 2) how IMPORTANT each of these behaviors is to you. Thus, for each statement, circle the number of your answer for SATISFACTION, and circle the letter of your answer for IMPORTANCE.

Use the following scale to answer how SATISFIED you are with your partner for each behavior listed below:

DISSAT-ISFIED	SOMEWHAT DISSATISFIED	PARTLY SATIS./ PARTLY DISSAT.	SOMEWHAT SATIS.	SATISFIED	VERY SATIS.
1	2	3	4	5	6

Use the following scale to answer how IMPORTANT each behavior listed below is to you:

NOT IMPORTANT	SOMEWHAT IMPORTANT	MODERATELY IMPORTANT	VERY IMPORTANT
A	B	C	D

Q-1	Goes out of his way to do special or thoughtful things for me.	1	2	3	4	5	6	A	B	C	D
Q-2	Encourages me to spend time with other women who are having the similar life experience of expecting a child.	1	2	3	4	5	6	A	B	C	D
Q-3	Uses touch to show me that he loves or cares for me.	1	2	3	4	5	6	A	B	C	D
Q-4	Helps keep up my morale.	1	2	3	4	5	6	A	B	C	D
Q-5	Lets me know how important I am as a helpmate during this pregnancy.	1	2	3	4	5	6	A	B	C	D
Q-6	Understands my concerns about the changes in our relationship and lifestyle the baby will bring.	1	2	3	4	5	6	A	B	C	D
Q-7	Helps me out when I'm in a pinch.	1	2	3	4	5	6	A	B	C	D
Q-8	Shows interest in my daily activities and problems, other than related to pregnancy.	1	2	3	4	5	6	A	B	C	D

Q-9	Helps me deal with my fears about having an unhealthy or abnormal child.	1	2	3	4	5	6	A	B	C	D
Q-10	Is good-natured about letting me blow off steam.	1	2	3	4	5	6	A	B	C	D
Q-11	Encourages me to take proper care of myself.	1	2	3	4	5	6	A	B	C	D
Q-12	Pitches in to help me do something that needs to get done.	1	2	3	4	5	6	A	B	C	D
Q-13	Is very positive and feels good about me having a baby.	1	2	3	4	5	6	A	B	C	D
Q-14	Lets me know that, despite the hassles involved, the pregnancy is worth it.	1	2	3	4	5	6	A	B	C	D
Q-15	Helps with chores, errands or work around the house during this pregnancy.	1	2	3	4	5	6	A	B	C	D
Q-16	Gives me information about what to expect for this pregnancy &/or parenthood.	1	2	3	4	5	6	A	B	C	D
Q-17	Allows me to talk about things that are very personal and private.	1	2	3	4	5	6	A	B	C	D
Q-18	Reassures me that I am attractive.	1	2	3	4	5	6	A	B	C	D
Q-19	Helps me learn things to be healthy.	1	2	3	4	5	6	A	B	C	D
Q-20	Helps get house, things, etc. ready for the baby.	1	2	3	4	5	6	A	B	C	D
Q-21	Takes time to spend with me.	1	2	3	4	5	6	A	B	C	D
Q-22	Accepts my work hours and schedule.	1	2	3	4	5	6	A	B	C	D
Q-23	Lets me know that I am appreciated for the things I do for him.	1	2	3	4	5	6	A	B	C	D
Q-24	Tolerates my ups and downs and unusual behaviors.	1	2	3	4	5	6	A	B	C	D
Q-25	Encourages me to do things I enjoy.	1	2	3	4	5	6	A	B	C	D
Q-26	Helps me by allowing me to compare my thoughts and feelings about being a										

parent to his.	1	2	3	4	5	6	A	B	C	D
Q-27 Helps me make decisions.	1	2	3	4	5	6	A	B	C	D
Q-28 Reassures me that having a baby is a natural event and people "survive".	1	2	3	4	5	6	A	B	C	D
Q-29 Lets me know he needs me.	1	2	3	4	5	6	A	B	C	D
Q-30 Takes me seriously when I have concerns.	1	2	3	4	5	6	A	B	C	D
Q-31 Says things that make my situation clearer and easier to understand.	1	2	3	4	5	6	A	B	C	D
Q-32 Comforts me by showing physical affection.	1	2	3	4	5	6	A	B	C	D
Q-33 Shares activities related to the pregnancy (e.g., doctor visits, prenatal classes).	1	2	3	4	5	6	A	B	C	D
Q-34 Gives me information or advice on how to do things.	1	2	3	4	5	6	A	B	C	D
Q-35 Helps me evaluate my attitudes and abilities by being someone in a similar situation.	1	2	3	4	5	6	A	B	C	D
Q-36 Lets me know that he will be around if I need assistance.	1	2	3	4	5	6	A	B	C	D
Q-37 Gives me feedback on how I am doing in this pregnancy.	1	2	3	4	5	6	A	B	C	D
Q-38 Tells me what to expect in situations that are about to happen.	1	2	3	4	5	6	A	B	C	D
Q-39 Is willing to do favors for me.	1	2	3	4	5	6	A	B	C	D
Q-40 Pampers me when I am tired or not feeling well.	1	2	3	4	5	6	A	B	C	D
Q-41 Reassures me (directly or indirectly) that I am loved or valued.	1	2	3	4	5	6	A	B	C	D
Q-42 Helps me feel that we share this pregnancy together.	1	2	3	4	5	6	A	B	C	D
Q-43 Reassures me that I will be a good parent for the new baby.	1	2	3	4	5	6	A	B	C	D
Q-44 Is patient and understanding										

about changes in our sex life. 1 2 3 4 5 6 A B C D

Q-45 Reassures me that we can make it financially after the baby comes. 1 2 3 4 5 6 A B C D

Support Behavior Inventory - Postnatal Version

We are interested in finding out the kinds of things that are helpful to mothers after the baby is born. Below is a list of different things that people do for each other. Please respond to each statement by answering 1) how SATISFIED you are with the amount your PARTNER/SPOUSE does each of these things; and 2) how IMPORTANT each of these behaviors is to you. Thus, for each statement, circle the number of your answer for SATISFACTION, and circle the letter of your answer for IMPORTANCE.

Use the following scale to answer how SATISFIED you are with your partner for each behavior listed below:

DISSAT-ISFIED	SOMEWHAT DISSATISFIED	PARTLY SATIS./ PARTLY DISSAT.	SOMEWHAT SATIS.	SATISFIED	VERY SATIS.
1	2	3	4	5	6

Use the following scale to answer how IMPORTANT each behavior listed below is to you:

NOT IMPORTANT	SOMEWHAT IMPORTANT	MODERATELY IMPORTANT	VERY IMPORTANT
A	B	C	D

Q-1	Goes out of his way to do special or thoughtful things for me.	1	2	3	4	5	6	A	B	C	D
Q-2	Encourages me to spend time with other women who are having the similar life experience of having a newborn.	1	2	3	4	5	6	A	B	C	D
Q-3	Uses touch to show me that he loves or cares for me.	1	2	3	4	5	6	A	B	C	D
Q-4	Helps keep up my morale.	1	2	3	4	5	6	A	B	C	D
Q-5	Lets me know how important I am as a helpmate since having this baby.	1	2	3	4	5	6	A	B	C	D
Q-6	Understands my concerns about the changes in our relationship and lifestyle since we've had the baby.	1	2	3	4	5	6	A	B	C	D
Q-7	Helps me out when I'm in a pinch.	1	2	3	4	5	6	A	B	C	D
Q-8	Shows interest in my daily activities and problems, other than related to the baby.	1	2	3	4	5	6	A	B	C	D
Q-9	Helps me deal with my fears about developmenatl lags or abnormalities in the baby	1	2	3	4	5	6	A	B	C	D
Q-10	Is good-natured about letting										

me blow off steam.	1	2	3	4	5	6	A	B	C	D
Q-11 Encourages me to take proper care of myself.	1	2	3	4	5	6	A	B	C	D
Q-12 Pitches in to help me do something that needs to get done.	1	2	3	4	5	6	A	B	C	D
Q-13 Spending time with someone who feels good about being a parent.	1	2	3	4	5	6	A	B	C	D
Q-14 Lets me know that, despite the hassles involved, it was worthwhile having the baby	1	2	3	4	5	6	A	B	C	D
Q-15 Helps with chores, errands or work around the house.	1	2	3	4	5	6	A	B	C	D
Q-16 Gives me information about what to expect parenting this baby.	1	2	3	4	5	6	A	B	C	D
Q-17 Allows me to talk about things that are very personal and private.	1	2	3	4	5	6	A	B	C	D
Q-18 Reassures me that I am attractive.	1	2	3	4	5	6	A	B	C	D
Q-19 Helps me learn things to be healthy.	1	2	3	4	5	6	A	B	C	D
Q-20 Helps get clothes, toys, diapers, ect. ready for the baby.	1	2	3	4	5	6	A	B	C	D
Q-21 Takes time to spend with me.	1	2	3	4	5	6	A	B	C	D
Q-22 Accepts my work hours and schedule.	1	2	3	4	5	6	A	B	C	D
Q-23 Lets me know that I am appreciated for the things I do for him.	1	2	3	4	5	6	A	B	C	D
Q-24 Tolerates my ups and downs and unusual behaviors.	1	2	3	4	5	6	A	B	C	D
Q-25 Encourages me to do things I enjoy.	1	2	3	4	5	6	A	B	C	D
Q-26 Helps me by allowing me to compare my thoughts and feelings about being a parent to his.	1	2	3	4	5	6	A	B	C	D
Q-27 Helps me make decisions.	1	2	3	4	5	6	A	B	C	D
Q-28 Reassures me that looking										

	after a newborn is demanding but people "survive".	1	2	3	4	5	6	A	B	C	D
Q-29	Lets me know he needs me.	1	2	3	4	5	6	A	B	C	D
Q-30	Takes me seriously when I have concerns.	1	2	3	4	5	6	A	B	C	D
Q-31	Says things that make my situation clearer and easier to understand.	1	2	3	4	5	6	A	B	C	D
Q-32	Comforts me by showing physical affection.	1	2	3	4	5	6	A	B	C	D
Q-33	Shares activities related to the parenting (e.g., doctor visits, arranging for babysitters).	1	2	3	4	5	6	A	B	C	D
Q-34	Gives me information or advice on how to do things.	1	2	3	4	5	6	A	B	C	D
Q-35	Helps me evaluate my attitudes and abilities by being someone in a similar situation.	1	2	3	4	5	6	A	B	C	D
Q-36	Lets me know that he will be around if I need assistance.	1	2	3	4	5	6	A	B	C	D
Q-37	Gives me feedback on how I am doing as a parent.	1	2	3	4	5	6	A	B	C	D
Q-38	Tells me what to expect in situations that are about to happen.	1	2	3	4	5	6	A	B	C	D
Q-39	Is willing to do favors for me.	1	2	3	4	5	6	A	B	C	D
Q-40	Pampers me when I am tired or not feeling well.	1	2	3	4	5	6	A	B	C	D
Q-41	Reassures me (directly or indirectly) that I am loved or valued.	1	2	3	4	5	6	A	B	C	D
Q-42	Helps me feel that we share in looking after this baby together.	1	2	3	4	5	6	A	B	C	D
Q-43	Reassures me that I am a good parent for the baby.	1	2	3	4	5	6	A	B	C	D
Q-44	Is patient and understanding about changes in our sex life.	1	2	3	4	5	6	A	B	C	D
Q-45	Reassures me that we can make it financially.	1	2	3	4	5	6	A	B	C	D

Appendix H: Personal Style Inventory

Here are a number of statements about personal characteristics. Please read each one carefully, and indicate whether you AGREE or DISAGREE, and to what extent, by CIRCLING a number following each statement.

Use the following scale:

STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
1	2	3	4	5	6

Q-1	I am very sensitive to criticism by others.	1	2	3	4	5	6
Q-2	I often find that I don't live up to my own standards and ideals.	1	2	3	4	5	6
Q-3	I find it difficult to be separated from people I love.	1	2	3	4	5	6
Q-4	I resent it when people try to direct my behavior or activities.	1	2	3	4	5	6
Q-5	I often put other people's needs before my own.	1	2	3	4	5	6
Q-6	I don't like relying on others for help.	1	2	3	4	5	6
Q-7	I worry a lot that people may criticize me.	1	2	3	4	5	6
Q-8	The standards and goals I set for myself are usually higher than those of other people.	1	2	3	4	5	6
Q-9	It is hard for me to break off a relationship even if it is making me unhappy.	1	2	3	4	5	6
Q-10	I rarely trust the advice of others when making a big decision.	1	2	3	4	5	6
Q-11	I am very sensitive to the effects I have on the feelings of other people.	1	2	3	4	5	6
Q-12	When I'm feeling blue, I don't like to be offered sympathy	1	2	3	4	5	6
Q-13	I am very sensitive to signs of possible rejection by others.	1	2	3	4	5	6
Q-14	It is hard for me to accept my own weaknesses and						

limitations. 1 2 3 4 5 6

Q-15 It is hard for me to take charge of my own affairs without help from other people. 1 2 3 4 5 6

Q-16 I am very upset when other people or circumstances interfere with my plans. 1 2 3 4 5 6

Q-17 I worry a lot about hurting or offending people. 1 2 3 4 5 6

Q-18 I don't like people to invade my privacy. 1 2 3 4 5 6

Q-19 I am easily persuaded by others. 1 2 3 4 5 6

Q-20 I tend to be very self-critical. 1 2 3 4 5 6

Q-21 I need other people's help in order to cope with life's problems. 1 2 3 4 5 6

Q-22 I try to maintain control over my feelings at all times. 1 2 3 4 5 6

Q-23 I try to please other people too much. 1 2 3 4 5 6

Q-24 It is hard for me to have someone dependent on me. 1 2 3 4 5 6

Q-25 It is very important to me to be liked and admired by others. 1 2 3 4 5 6

Q-26 I believe in doing something well or not doing it at all. 1 2 3 4 5 6

Q-27 I never really feel secure in a close relationship, because I am concerned that I might lose the other person. 1 2 3 4 5 6

Q-28 I am easily bothered by other people making demands of me. 1 2 3 4 5 6

Q-29 I often feel responsible for solving other people's problems. 1 2 3 4 5 6

Q-30 I can be completely independent of other people. 1 2 3 4 5 6

Q-31 I am very concerned with how people react to me. 1 2 3 4 5 6

Q-32 I should be able to excel at anything if I try hard enough. 1 2 3 4 5 6

Q-33 I find it difficult if I have to be alone all day.	1	2	3	4	5	6
Q-34 I often try to change other people's behavior.	1	2	3	4	5	6
Q-35 I feel I have to be nice to other people.	1	2	3	4	5	6
Q-36 I tend to keep other people at a distance.	1	2	3	4	5	6
Q-37 I get very uncomfortable when I'm not sure whether or not someone likes me.	1	2	3	4	5	6
Q-38 I usually view my performance as either a complete success or a complete failure.	1	2	3	4	5	6
Q-39 It is very hard for me to get over the feeling of loss when a relationship has ended.	1	2	3	4	5	6
Q-40 It is hard for me to take instructions from people who have authority over me.	1	2	3	4	5	6
Q-41 I am too apologetic to other people.	1	2	3	4	5	6
Q-42 It is hard for me to open up and talk about my feelings and other personal things.	1	2	3	4	5	6
Q-43 I often censor what I say because the other person may disapprove or disagree.	1	2	3	4	5	6
Q-44 I judge myself as a person based on the quality of the work that I do.	1	2	3	4	5	6
Q-45 I like to be certain that there is somebody close I can contact in case something unpleasant happens to me.	1	2	3	4	5	6
Q-46 When making a big decision, I usually feel that advice from others is intrusive.	1	2	3	4	5	6
Q-47 It is hard for me to say "no" to other people's requests.	1	2	3	4	5	6
Q-48 It is hard for me to express admiration or affection.	1	2	3	4	5	6
Q-49 It is hard for me to be nonconformist.	1	2	3	4	5	6

Q-50 It bothers me when I feel that I am only average and ordinary.	1	2	3	4	5	6
Q-51 I become upset when something happens to me and there's nobody around to talk to.	1	2	3	4	5	6
Q-52 I become upset more than most people I know, when limits are placed on my personal independence and freedom.	1	2	3	4	5	6
Q-53 I often let people take advantage of me.	1	2	3	4	5	6
Q-54 It is difficult for me to make a long-term commitment to a relationship.	1	2	3	4	5	6
Q-55 I am most comfortable when I know my behavior is what others expect of me.	1	2	3	4	5	6
Q-56 I feel badly about myself when I am not actively accomplishing things.	1	2	3	4	5	6
Q-57 I become very upset when a friend breaks a date or forgets to call me as planned.	1	2	3	4	5	6
Q-58 I resent it when others assume responsibility for my plans.	1	2	3	4	5	6
Q-59 It is hard for me to let people know when I am angry with them.	1	2	3	4	5	6
Q-60 In relationships, people are often too demanding of one another.	1	2	3	4	5	6

Appendix I: Revised Infant Temperament Questionnaire

The purpose of this questionnaire is to determine the general nature of your infant's reactions to his/her environment. This first part consists of several questions regarding your infant. Please circle the number indicating the frequency with which you think the statement is true for your infant. Although some of the statements may seem similar, they are not the same and should be rated independently. If any item cannot be answered or does not apply to your infant, just draw a line through it. If your infant has changed with respect to any of the areas covered, use the response that best describes the recently established pattern. There are no good and bad or right and wrong answers, only descriptions of what your infant does.

Using the following scale, please circle the number that best indicates how often your infant's recent and current behavior has been like that described by each item:

ALMOST NEVER	RARELY	VARIABLE: USUALLY DOES NOT	VARIABLE: USUALLY DOES	FREQUENTLY	ALMOST ALWAYS
1	2	3	4	5	6

Q-1	The infant eats about the same amount of solid food (within 1 oz) from day to day.	1	2	3	4	5	6
Q-2	The infant is fussy on waking up and going to sleep (frowns cries).	1	2	3	4	5	6
Q-3	The infant accepts right away any change in place or position of feeding or person doing it.	1	2	3	4	5	6
Q-4	The infant accepts nail cutting without protest.	1	2	3	4	5	6
Q-5	The infant accepts his/her bath any time of the day without resisting it.	1	2	3	4	5	6
Q-6	The infant takes feedings quietly with mild expression of likes and dislikes.	1	2	3	4	5	6
Q-7	The infant wants and takes milk feedings at about the same times (one hour) from day to day.	1	2	3	4	5	6
Q-8	The infant is shy (turns away or clings to mother) on meeting another child for the first time.	1	2	3	4	5	6

Q-9 The infant vigorously resists additional food or milk when full (spits out, clamps mouth closed, bats at spoon, etc.).	1	2	3	4	5	6
Q-10 The infant resists changes in feeding schedule (1 hr or more) even after two tries.	1	2	3	4	5	6
Q-11 The infant's bowel movements come at different times from day to day (over one hour difference).	1	2	3	4	5	6
Q-12 The infant makes happy sounds (coos, smiles, laughs) when being diapered or dressed.	1	2	3	4	5	6
Q-13 The infant accepts new foods right away, swallowing them promptly.	1	2	3	4	5	6
Q-14 The infant reacts mildly (just blinks or startles briefly) to bright lights such as flash bulb or letting sunlight in by pulling up the shade.	1	2	3	4	5	6
Q-15 The infant is pleasant (smiles, laughs) when first arriving in unfamiliar places (friend's house, store).	1	2	3	4	5	6
Q-16 The infant gets sleepy at about the same time each evening (within 1/2 hr)	1	2	3	4	5	6
Q-17 The infant accepts regular procedures (hair brushing, face washing etc.) without protest.	1	2	3	4	5	6
Q-18 The infant's initial reaction to a new babysitter is rejection (crying, clinging to mother, etc.).	1	2	3	4	5	6
Q-19 The infant objects to being bathed in a different place or by a different person even after 2 or 3 tries.	1	2	3	4	5	6
Q-20 The amount of milk the infant takes at feedings is quite unpredictable (over 2 oz difference) from feeding to feeding.	1	2	3	4	5	6
Q-21 For the first few minutes in a new place or situation						

(new store or home) the infant is fretful. 1 2 3 4 5 6

Q-22 The infant reacts strongly to foods, whether positively (smacks lips, laughs, squeals) or negatively (cries). 1 2 3 4 5 6

Q-23 The infant is pleasant (coos, smiles, etc.) during procedures like hair brushing or face washing. 1 2 3 4 5 6

Q-24 The infant greets a new toy with a loud voice and much expression of feeling (whether positive or negative). 1 2 3 4 5 6

Q-25 The infant's initial reaction at home to approach by strangers is acceptance. 1 2 3 4 5 6

Q-26 The infant wants daytime naps at differing times (over 1 hour difference) from day to day. 1 2 3 4 5 6

Q-27 The infant cries when left alone to play. 1 2 3 4 5 6

Q-28 The infant adjusts within 10 minutes to new surroundings (home, store, play area). 1 2 3 4 5 6

Q-29 The infant's daytime naps are about the same length from day to day (under 1/2 hr difference). 1 2 3 4 5 6

Q-30 The infant displays much feeling (vigorous laugh or cry) during diapering or dressing. 1 2 3 4 5 6

Q-31 The infant adjusts easily and sleeps well within 1 or 2 days of changes of time or place. 1 2 3 4 5 6

Q-32 The infant wants and takes solid food feedings at about the same time from day to day (within 1 hr). 1 2 3 4 5 6

Q-33 The infant is content (smiles, coos) during interruptions of milk or solid feedings. 1 2 3 4 5 6

Q-34 The infant accepts within a few minutes a change in place of bath or person

giving it.	1	2	3	4	5	6
Q-35 The infant cries for less than one minute when given an injection.	1	2	3	4	5	6
Q-36 The infant continues to react to a loud noise (hammering, barking dog, etc.) heard several times in the same day.	1	2	3	4	5	6
Q-37 The infant's initial reaction is withdrawal (turns head, spits out) when consistency, flavor or temperature of solid foods is changed.	1	2	3	4	5	6
Q-38 The infant's time of waking in the morning varies greatly from day to day.	1	2	3	4	5	6
Q-39 The infant reacts strongly to strangers: laughing or crying.	1	2	3	4	5	6
Q-40 The infant's period of greatest physical activity comes at the same time each day.	1	2	3	4	5	6
Q-41 The infant appears bothered (cries, squirms) when first put down in a different sleeping place.	1	2	3	4	5	6
Q-42 The infant reacts mildly to meeting familiar people (quiet smiles or no response).	1	2	3	4	5	6
Q-43 The infant is fussy or moody throughout a cold or intestinal virus.	1	2	3	4	5	6
Q-44 The infant wants an extra feeding at a different time each day (over 1 hr difference).	1	2	3	4	5	6
Q-45 The infant is still frightened or wary of strangers after 15 minutes.	1	2	3	4	5	6
Q-48 The infant plays quietly and calmly with toys (little vocalization or noise).	1	2	3	4	5	6
Q-49 The infant's fussy period occurs at about the same time of day (morning,						

afternoon, evening).	1	2	3	4	5	6
Q-50 The infant is calm in the bath. Like or dislike is mildly expressed (smiles or frowns).	1	2	3	4	5	6
Q-51 The infant requires introduction of a new food on 3 or more occasions before he/she will accept (swallow) it.	1	2	3	4	5	6
Q-52 The infant acts the same when the diaper is wet as when it is dry (no reaction).	1	2	3	4	5	6
Q-53 The infant is fussy or cries during the physical examination by the doctor.	1	2	3	4	5	6
Q-54 The infant accepts changes in solid food feedings (type, amount, timing) within 1 or 2 tries.	1	2	3	4	5	6

Mother's General Impression of Infant's Temperament

A How would you describe your baby's temperament in your own words?

_____

_____.

B In comparison with what you know of other babies of the same age, how would you rate your baby as to the following criteria? (circle one for each question)

Q-1 Activity level - the amount of physical activity during sleep, feeding, play, dressing, etc.

1 HIGH
2 MEDIUM
3 LOW

Q-2 Regularity - of bodily functioning in sleep, hunger, bowel movements, etc.

1 FAIRLY REGULAR
2 VARIABLE
3 FAIRLY IRREGULAR

Q-3 Adaptability to change in routine - the ease or difficulty with which initial response can be modified in a socially desirable way.

1 GENERALLY ADAPTABLE
2 VARIABLE
3 GENERALLY SLOW AT ADAPTATION

Q-4 Response to new situations - initial reaction to new stimuli, to food, people, places, toys, or procedures

1 APPROACH
2 VARIABLE
3 WITHDRAWAL

Q-5 Level of sensory threshold - the amount of external stimulation,such as sounds or changes in food or people, necessary to produce a response in the baby.

1 HIGH THRESHOLD (MUCH STIMULATION NEEDED)
2 MEDIUM
3 LOW THRESHOLD (LITTLE STIMULATION NEEDED)

Q-6 Intensity of response - the energy content of responses regardless of their quality.

1 GENERALLY INTENSE
2 VARIABLE
3 GENERALLY MILD

Q-7 Positive or negative mood - amount of pleasant or unpleasant behavior throughout the day.

1 GENERALLY POSITIVE
2 VARIABLE
3 GENERALLY NEGATIVE

Q-8 Distractibility - the effectiveness of external stimuli (sounds, toys, people, etc.) in interfering with ongoing behavior.

1 EASILY DISTRACTABLE
2 VARIABLE
3 NON-DISTRACTABLE

Q-9 Persistence and attention span - duration of maintaining specific activities without external obstacles.

1 PERSISTENT
2 VARIABLE
3 NON-PERSISTENT

C How has the baby's temperament been a problem for you?

_____

_____.

D In general, temperament of baby is:

1 ABOUT AVERAGE
2 MORE DIFFICULT THAN AVERAGE
3 EASIER THAN AVERAGE

Appendix J: Daily Crying Record of Infant

Instructions for Infant Crying Record

Since crying is one of the main ways that babies can communicate at this age, we would like to know how often and for how long your baby cries each day. We would like you to use the form provided to chart his or her crying behavior for seven days. Ideally, we would like you to complete the chart during the week (7 days) immediately before your baby's four month birthdate, but if that time is inconvenient, please try and complete it over any seven day period **before** your baby is four months old.

The form is like a weekly calendar, with the days from Monday to Sunday listed on the page. The 24 hours in each day are broken down into one hour time slots, starting at 12 a.m. (which is midnight) and ending at 11:00 p.m.. For each hour time slot, fill in the approximate number of minutes that your baby was crying during that hour. That is, you would be writing down a number from 0 (no crying during that time period) to 60 (the baby cried for all of that hour period). Please record a number in each of the time slots for each day. For example, during the hours that your little one is sleeping, you would fill in lots of zeros, indicating that there was no crying during those time periods.

	MONDAY	TUESDAY
12:00 A.M.	0	9
1:OO	0	0
2:00	11	0
3:00	13	0
4:00	0	0
5:00	0	20

In the above example using part of the chart, one can see that the baby cried for 11 minutes between 2 and 3 a.m., and 13 minutes between 3 and 4 a.m. on Monday night. During Tuesday night, the baby cried for a total of 9 minutes between midnight and 1 a.m., and cried for a total of 20 minutes between 5 and 6 a.m..

As a reminder to chart your baby's crying behavior, it may help to keep the form in the area where you change diapers. Then, every time you change a diaper, you can update the form.

If you have any questions about completing this form, please call Lesley Graff at 474-9338, and I will get back to you as soon as I can. Thank you for taking the time to record this important information.

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
12 a.m.							
1:00							
2:00							
3:00							
4:00							
5:00							
6:00							
7:00							
8:00							
9:00							
10:00							
11:00							
12 noon							
1:00							
2:00							
3:00							
4:00							
5:00							
6:00							
7:00							
8:00							
9:00							
10:00							
11:00							