FACTORS PREDICITVE OF DEPRESSION SCORES TAKEN AT ONE AND SIX WEEKS POSTPARTUM

(c) Susan A. Chandler 1988

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Approved : _____
Thesis Supervisor

Approved : _____
Thesis Committee Member

Approved : _____
Thesis Committee Member

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ABSTRACT

Factors Predictive of Depression Scores Taken At One and Six Weeks Postpartum.

Susan A. Chandler

April 1988

The main purpose of this study was to identify factors significantly related to postpartum depression scores. Thirty seven multiparous and primiparous normal women were studied prospectively in regard to depression; stress; social support, hormonal, and cognitive factors. Questionnaires related to these five areas of interest were completed by each subject during the third trimester of pregnancy; on day 5, 6, or 7 postpartum, and at six weeks poatpartum.

Forward and stepwise regressions were used to analyse the data at each phase of the study. Depession scores taken the first week postpartum were significantly related to the depression scores taken during pregnancy: to birth stressors; to a mother's sense of efficacy; and to pre-menstrual tension. The depression scores taken at six weeks postpartum were significantly related to the depression scores taken during the early puerperium, and to general life stress scores.

A combined set of measures was seen to predict the postpartum depression scores better than any single measure.

FACTORS PREDICTIVE OF DEPRESSION SCORES TAKEN AT ONE AND SIX WEEKS POSTPARTUM

Following childbirth a woman is vulnerable to a range of psychological difficulties, not the least of which can be depression. Theories, both psychological and physiological, have been developed to explain why women are particularly vulnerable to depression in the postnatal period.

Puerperal Psychosis

Although there is evidence that childbirth is a precipitating factor in those who are genetically and constitutionally predisposed to major mental illness (Protheroe, 1969), there is still much debate about whether puerperal pyschosis is a specific entity, or comparable to other sorts of mental disorders that develop at other times. This debate has been in evidence for quite some time:

> During and before the nineteenth century, pychotic illness which began in the puerperium was regarded as a disease...then early in the twentieth century, as psychiatrists adapted the classification system of Kraeplin, it was found the "postpartum-psychosis" did not fit into the categories which were being established...the distinguishing characteristics of postpartum pychosis were first minimized, then forgotten (Hamilton, 1982, p.1).

Although the debate over postpartum psychosis has experienced a revival, the clarification of operational guidelines remains obscure "in spite of...powerful investigatory tools including the disciplines of epidemiology and genetics, statistical methods, and hormone measurements" (Brockington, Winohur, and Dean,

1982, p.65). Despite the emerging concensus in the medical community "that in order to be qualified as 'postpartum,' or 'puerperal,' a psychiatric illness should have begun within two, or at the most four weeks after childbirth" (Meltzer and Kumar, 1985, p.652), it would seem that defining puerperal psychosis purely in terms of time intervals is not wholly satisfactory. As pointed out by Brockington et al.,(1982) the difficulties relating to defining postpartum psychosis in the context of time are twofold: first there is difficulty in precisely establishing the time of onset; and second, different illnesses may start within that interval, either by chance, or because they have their own causal link with childbirth. Brockington et al., argue that one way to solve such contaminating interaction, is to identify the clinical features of the different disorders.

A prospective clinical investigation was undertaken by Brockington et al.,(1982) to document puerperal illness in a broad clinical approach, using multiple information sources, multiple raters, and extensive narrative descriptions. The study showed :

> a marked difference in the diagnostic profile of puerperal and non-puerperal psychosis ($p<0.001$)...it appears that a segment of the psychotic spectrum, roughly equivalent to the paranoid psychosis, is missing from the puerperal group. This is not to deny that typical schizophrenic symptons are not to be found in these patients...but generally speaking they only occur in the context of a manic mood disorder (Brockington et al., 1982, p.47).

Other studies support the general finding that affective disturbances are prominant in most partum illness and that manic disorders, in particular, have an early onset (Meltzer and Kumar, 1985; Dean and Kendell, 1981).

Hence the overall finding of these studies is that a link exists between the puerperal psychosis and manic

depressive pyschosis. However, a precise clarification of the link require further empirical analysis.

Postnatal Depression

Even less precision surrounds the classification of Postnatal Depression. As its name indicates, Postnatal Depression comprises the middle range of the depressive spectrum, and is neither as mild as the Maternity Blues, nor as severe as puerperal psychosis. Its victims experience a depression which:

> varies from day to day, with more bad nights than good, tending to be worse towards evening and associated with fatigue, irritability...disturbance of appetite (usually anorexia), early insomnia and loss of libido...In addition the neurotic puerperal depressive worries about the baby in every conceivable way...For many mothers this depression is a novel and unwelcome experience, developing a little later in the puerperium than the psychotic form, usually as a discouraging failure to develop a satisfactory routine after getting home from hospital. Some women feel odd, changed, or physically impaired. Others are guilty about a supposed maternal inadequacy or lack of feeling, and are diffident about seeking help (Pitt, 1982, p. 364).

Estimates of the incidence of Postnatal Depression vary from being as general an estimate as 3.0% to 20% (Stern and Kruckman, 1981), to being as specific an estimate as 11.0% (Selby, Calhoun, Vogel, and King, 1980). One possible reason for the extreme variance in estimation is that women suffering from the disorder are rarely hospitalized, so that observation of related symptoms must take place through less systematic methods, such as the observations of medical practitioners.

The Maternity Blues

The mildest form of puerperal depression is referred to as the Maternity Blues. The word "Blues" is stressed because it has connotations of a low mood that is relatively mild and transient. Such is the case with the Maternity Blues, which is seen to be a fleeting depression, usually occurring from the third to the tenth day postpartum (Stein, 1982). The Maternity Blues is characterized not only by transitory depression and tearfulness, but also by anxiety and mild confusion. The confusion is manifested by poor concentration, slowness to learn, and forgetfulness (Pitt, 1973). The incidence of the Blues has been estimated as ranging from 15.0% (Oppenheim, 1962), to 80.0% (Robin, 1962). A controlled study by Pitt (1973) placed the estimate of incidence at closer to 50.0%.

Each type of postpartum depression is associated with a wide variety of factors. As the focus of this study is on a sample of normal women puerperal psychosis and the primary factors it is associated with (i.e. genetic and somatic predisposition) will not be considered. Instead, the postnatal literature is reviewed in terms of the disorders most likely to be experienced by normal women - in particular, postnatal depression, and the Maternity Blues. Table 1 presents a summary of the factors that will be discussed in this paper.

Factors Related to the Maternity Blues and Postpartum Depression

Hormonal Factors

Yalom, Lunde, Rudolf and Hamburg (1968) in their study of the Maternity Blues identified a correlation between women with a higher average daily depression, and

Table 1
FACTORS ASSOCIATED WITH POSTPARTUM DEPRESSION

Factor	The Maternity Blues	Postpartum Depression (pp dep)
Hormonal Factors pre-menstrual tension	Positive correlation (Yalom et.al.,1968; Nott et.al.,1976)	No association
Life Stress including pregnancy stress	Positive correlation (Paykel et.al.,1980;	Positive correlation O'Hara et.al.,1983)
Birth Stress	Contradictory results: Association of difficult deliveries with lower levels of postpartum depression (O'Hara et.al.,1983; Paykel et.al.,1980) Association of difficult deliveries with high levels of postpartum depression (Pye and McGee,1981)	
Social Support	No association	Unclear results; possibility that low social support increases susceptability to pp dep. (Pye and McGee,1981; Nuckolls et.al.1972
Depression in Pregnancy	Positive correlation (O'Hara et.al.,1982	Positive correlation Olioff & Aboud,1984)
Depression in the Early Puerperum	N/A	Relationship not explored (Kendell,1981 Saks et.al.,1985)
Cognitive Factor Mother Efficacy	Positive correlation (Olioff and	Positive correlation Aboud,1984)

a cluster of factors, including age of menarche, menstrual difficulties, parity, length of menstrual flow, and length of interval since the last pregnancy. In comparison, the data from women who suffered from a severe discrete depressive episode correlated with factors related to labor and delivery. Yalom et al., see the latter group of women as developing depression because of the stress of labor and delivery; while the depression in the former group of women is explained by means of endocrine factors. The authors hypothesize that the depressed subjects in the former group may have disturbances in steroid hormone secretion or metabolism, since the incidence of postpartum depression was found to be associated with various endocrine related factors.

The endocrine theory of postnatal depression was popularized by such theorists as Pitt (1973; 1982) and Dalton (1971). Pitt speculated that the Maternity Blues is largely a function of endocrine factors because two thirds of the Blues cases develop within four days of labor, with a peak incidence on the third day. From this he concluded that the relevant change might be the precipitate fall in postpartum progesterone and estrogen levels. Dalton also identified hormonal factors as being linked to the Blues by concluding that "depression during the puerperium occur[s] following the sudden loss of the placental steroid output" (Dalton, 1971, p. 691). Neither conclusions were based on empirical evidence, or logical consistency.

The hormonal theory of postnatal depression does not account for the differences in either the onset or duration of the disorder. Hormonal changes concomitant with childbirth should not vary greatly over women. Additively, as Gelder (1978) reasons, the logic of the explanation would require all women who bear children to exhibit depressive disorders. As he points out, the hormonal hypothesis fails to explain why only a minority

of women experience depression of clinical severity, when ostensibly all women experience hormonal fluctuations after childbirth. Identification of inconsistencies in the hormonal theory have been supported empirically, as well as theoretically.

Nott, Franklin, Armitage and Gelder (1976) investigated the supposition that postpartum emotional disturbances are related to hormonal changes by examining 27 normal pregnant women three times before delivery and sixteen times in the six weeks following delivery. During the first two interviews baseline data on personality, and other personal variables, were obtained. On each occassion blood was taken and plasma lutinizing hormone, follicle stimulating hormone, and prolactin levels were determined by double antibody radioimmunassays. The study did not produce any strong evidence that hormones are related to mood. However, the group which was depressed after delivery contained more women with a history of premenstrual tension.

Although hormonal changes after delivery are not seen to contribute to the phenomenon of puerperal depression, it still remains that an association has been identified between the Blues and premenstrual tension (Nott et al., 1976; Yalom et al., 1968). One explanation for this association is that women who experience the Blues might be more sensitive to hormonal fluctuations - such as those occurring after delivery, and prior to menstruation (Pitt, 1982). Such a suggestion can only be regarded as speculation because possible mechanisms underlying hormonal sensitivity are not understood. Consequently it remains undetermined whether the amount of premenstrual tension experienced is a function of low tolerance to physical discomfort, or sensitivity to endocrine factors. Considering the former it could be hypothesized that women sensitive to the discomfort of menstruation are similarly depressed by the discomfort of childbirth. In this regard

the correlation between the two factors would be a function of an individual's ability to tolerate discomfort, and not her sensitivity to hormonal fluctuations.

Birth Stress

Sensitivity to discomfort is also an issue in the analysis of birth stress, and the role it plays in postpartum depression. Studies that have utilized mixed primiparous and multiparous samples have associated difficult deliveries with lower levels of postpartum depression (O'Hara, Relm, Campbell, 1983; Paykel et al., 1980). By way of explanation it has been proposed that women with more stressful deliveries receive more social support from the hospital staff and from their partners, which could function to reduce depressive symptomatology.

Alternate results were found by Pye and McGhie (1981) in a study that examined 56 normal primiparous women. Contrary to previous studies birth related stresses were the second strongest predictive factor of posthatal depression, following pregnancy depression. Furthermore, while pregnancy depression and birth related stresses contributed independently to postpartum depression:

> The multiple contingency analysis indicates that there is also an interaction between these two factors. Women who became depressed following the birth of the baby all experienced birth related stresses whereas none of the women who were depressed in pregnancy and recovered by one month postpartum experienced a birth related stress (Pye and McGhie, 1981, p. 104).

The authors suggest that the results represent a "vulnerability-stress interaction" (Pye and McGhie, 1981, p. 104). However, the authors caution that:

> It is likely that depressive phenomena are complex-

> ly determined. The number of potential causal factors is large and most lines of evidence attempt to account for only one or at most a few factors... it is impossible to elucidate the interrelationships among these factors(Pye and McGhie, 1981, p. 49-50).

Life Stresses

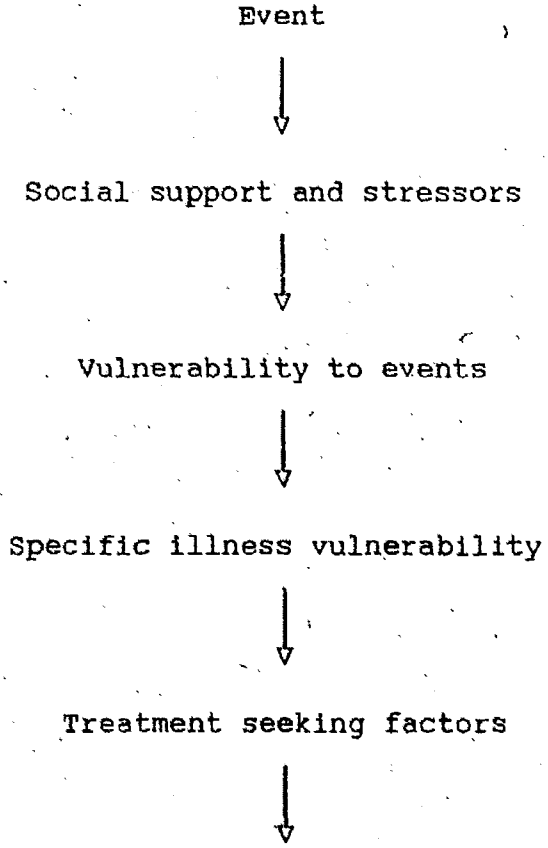
Studies of depression, in general, indicate the importance of life stress as a contributing factor (Paykel, Myers, Dienelt, Klerman, Lindenthal, and Pepper, 1969; Brown and Harris, 1978). Some authors have extended this conclusion to postpartum depression. Gordon and Gordon (1960) found that the number of stressful life events was highly correlated with the severity of disorders experienced by maternity patients. Recent studies have similarly found that stressful life events are strongly associated with both mild and moderate depression in women (Paykel et al., 1980; O'Hara, Rehm, and Campbell, 1983). Dean and Kendell (1981) found that comparative conclusions could be made about women suffering from a severe depressive disorder following childbirth. They reported that 80.0% of their subjects, who developed a psychiatric illness within 90 days of delivery, had experienced stressful life events.

Social Support

Results from studies that have focused on the impact that life stress has upon postpartum depression lend support to a model proposed by Paykel (1969) - were stressful events are seen as both necessary and of primary importance in determining depressive symptomatology. In the model social support and vulnerability factors act as modifiers of stressors (see Figure 1). Lack of social support is identified as the second most important

Figure 1

PAYKEL'S MODEL OF DEPRESSION
(1969)



contributor to the onset of depression. However, social support is not seen as a major contributor to postpartum depression in those studies that have assessed its impact.

In a study by Pye and McGhie (1981) confirmation of the social support and vulnerability components of Paykel's model was not strongly supported. In the study 56 normal primiparous women performed self-ratings of depression and anxiety at 16, 26, and 36 weeks of pregnancy and one, three and five months postpartum. At each measurement phase during pregnancy and in the first week following delivery, the women also completed measures of a number of variables expected to show a relationship to depression. These measures included stressful life events, patterns of activity and reinforcement, social support, self-esteem, planning status of pregnancy and initial reactions. The measures that showed a significant relationship to postpartum depression were: depression at 26 weeks of pregnancy, stressful events related to the birth of the baby, planned pregnancy and lack of "motherly" feeling on first contact with the baby.

Social support ranked fourth in significant contribution to pregnancy depression, but did not emerge as a significant factor in the multiple regression of postpartum depression. The authors comment that:

> It is possible that social support would emerge as a significant factor in a multivariate study involving a larger sample. The results for the present group, however, suggest an altered ranking of Paykel's factors so that social support is placed lower in the chain rather than second to events as Paykel has ranked it (Pye and McGhie, 1981, p. 117).

The results by Pye and McGhie are supported in a study by Nuckolls, Cassel, and Kaplan (1972). Using a prospective design, the authors looked at the relationship between social support, cumulative life change scores, and the prognosis of pregnancy. Taken alone, neither life

change nor social support were significantly related to psychological difficulties after delivery. However, when these variables were considered conjointly it was found that if the life change score was high both before and during pregnancy, women with high social support had only one third the complication rate of women with low social support scores. The authors do not propose that low social support, when combined with many life stressors "is a cause for any specific clinical entity, but rather propose that it may enhance susceptibility to a variety of environmental insults" (Nuckolls et al., 1972, p. 438). Hence limited social support is not seen as being responsible for depression, but possibly as increasing susceptibility to it.

Depression In Pregnancy

Pregnancy has traditionally been regarded by psychological theorists as a time of calm and fulfillment for a woman. Deutsch (1947) described pregnancy as the fulfillment of a woman's deepest yearnings, and as a period during which a woman could give up all other demands and pressures and devote herself to the forthcoming child. She writes:

> Every woman has desires or aspirations that have nothing in common with the reproductive function. She has her own personal ego which strives for expression, enlargement, gratification, and experience...Woman is offered the opportunities for developing her ego outside of the reproductive function while the idiology of active motherliness is exalted (Deutsch, 1947, p. 63).

The theory that many women feel a sense of fulfillment during pregnancy is in sharp opposition to the outcomes of more recent empirical studies. Such studies instead indicate that pregnancy is a time of emotional upheaval.

In one prospective study Saks, Frank, Lowe, Berman, Naftolin, and Cohen (1985) reviewed the frequency of depression in 20 normal pregnant women. The subjects rated their level of emotions and various depressive symptoms at 26 and 36 weeks of pregnancy, and filled out a brief questionnaire about the emotional circumstances of their pregnancy. The measures were repeated at 2 days and 6 weeks postpartum, along with a clinical interview. One major finding of the study was that women who develop negative postpartum moods, also demonstrate antepartum distress.

Other recent prospective studies have similarly found a relationship between postpartum depression and depression during pregnancy (O'Hara, Rehm, and Campbell, 1982; Pye and McGhie, 1981; Olioff and Aboud, 1984). In each of these studies group mean depression scores were significantly higher prepartum than postpartum. About these results Olioff and Aboud (1984) comment that because the early postpartum period is one of particularly high risk it is "a phenomenon worthy of study in its own right" (Olioff and Aboud, 1984, p. 19).

Zajicek and Wolkind (1981) who completed a longtitudinal study of 247 primiparous women living in the Inner London Borough of Tower Hamlets, speculate that conflicts of pregnancy differ according to the stage to which one is referring:

> The conflict about being pregnant which occurs at the beginning of pregnancy results in lack of preparation for the birth and feelings that having a child will cause problems. However, many such women seem to resolve their conflicts by seven months of pregnancy, and tend to react positively at that time. Conflicts about being pregnant which occur later during pregnancy are not related to whether or not the pregnancy was planned and whether the woman originally felt pleased to be pregnant. They are conflicts which seem to arise directly from the psychophysical experience of pregnancy, which are perhaps linked to more

> general reactions to womanhood (Zajicek and Wolkind, 1981, p. 49).

These theories have in common the theme that depression during pregnancy is related to the general ambivalence that women experience about their femininity when they are undergoing the process of bearing children. Underlying this theme is the assumption that antepartum depression is specifically related to issues of pregnancy and childbirth and femininity. If on the other hand, depression during pregnancy is undifferentiated from other types of depression (Watson, Elliott, Rugg and Brough, 1984; Pitt, 1982), then pregnancy is seen as a non-specific stressor; rather than as a primary contributing variable. Consequently, theories that apply to depressive disorders in general, could also be applied to those occurring during pregnancy and the puerperium. Essentially the question cannot be resolved until prospective studies include pre-pregnancy as well as pregnancy assessments; in addition to non-pregnant control groups.

Depression In The Early Puerperium

Although a relationship between pregnancy and puerperal depression has been identified, there is very little research that compares the different stages of the puerperium. However, much of what is lost in quantity is compensated by quality. The studies that do look at the predictive ability of depression in the early puerperium are well designed and executed.

Kendell (1981) employed six visual analogue scales in a prospective design to determine that women who became clinically depressed in the later puerperium had higher depression and lability ratings, and a more pronounced five day postpartum peak, than their non-depressed counterparts. The study by Kendell demonstrates how

psychological variables in the early puerperium have predictive value for later postnatal depression.

The early postpartum period was also studied prospectively by Saks et al., (1985). The antepartum mood scale identified women with postpartum depression and differentiated this condition from the Maternity Blues. The outcome prompted the authors to question whether the Postpartum Blues is a "sufficien[t] comprehensive diagnostic entity" (Saks et al., 1985, p. 730).

To accurately assess the diagnostic integrity of the Blues it is perhaps necessary to regard it within a time frame that extends beyond the second day postpartum. As the early postpartum period is marked by great emotional and physical upheaval (adjustment to a new baby, and the physical recovery from labor), it remains quite possible that day 2 postpartum might present a different psychological profile than day 7. This arguement is given credibility by the description presented by Saks et al., (1985) of the "postpartum pinks," which they characterize as a sense of "relative well-being, joy, and surprise" (Saks et al., 1985, p. 730) soon after delivery. This phenomenon has not been identified by other authors who administered psychological measures at 7, as opposed to 2, days postpartum (Pye and McGhie, 1981; Olioff and Aboud, 1984).

Olioff and Aboud (1984) assessed 40 primiparous women at 9 months of pregnancy and at 1 and 6 weeks postpartum. Levels of depression, which were assessed by the Beck Depression Inventory, were higher at one week than at six weeks postpartum. However, the depression scores were significantly higher prepartum than at each postpartum phase. Other studies similarly report that depression was as severe or worse prepartum as postpartum in a variety of samples (Handly et al., 1980; O'Hara et al., 1984; Rees and Lutkins, 1971). The obvious conclusion from these results is that pregnancy in and of itself warrants

investigation - and that it is possibly the most appropriate time to identify women at risk for later depression.

Ideally women should be identified during pregnancy so that intervention strategies could be implemented to ameliorate the situation before the arrival of the baby. However, pre-natal visits as a rule do not include psychological assessments, so that the opportunity for early detection of depressed women is greatly reduced. A more likely time for identification is after delivery, when a woman is hospitalized and interacting regularly with hospital staff. Hence the importance of fully understanding the implications of the Maternity Blues.

It still remains to be established if the Blues is predictive of later postpartum depression - and if the factors associated with each postpartum phase are similar or different. If one phase is associated with different factors than is the other, then it can be assumed they have varying aetiologies.

Cognitive Factors

In a study by Olioff and Aboud (1984) the cognitive component of Mother Efficacy was examined. The authors developed the Mother Efficacy Scale (MES) to provide a situation-specific measure of pregnant womens' expectations regarding their ability and confidence in performing 10 activities that are related to the care of a baby. The Mother Efficacy Scale, in addition to other questionnaires relating to depression, and to demographic and pregnancy-related variables, were administered according to a prospective design. Forty primiparous normal women were assessed individually at 9 months of pregnancy and at 1 and 6 weeks postpartum. The major findings of the study were that prepartum self-esteem and

expected Mother Efficacy were the best predictors of Moderate Postpartum Depression scores.

The study suggests that it is a woman's perception of particular events, as well as the events themselves, that determine the onset of depression. How the two factors interact needs to be clarified with further study.

Rationale And Objective Of The Present Research

The primary focus of the study was on a sample of normal primiparous and multiparous women. It is important to understand the psychological changes that normal women undergo when having children, as very little medical support is available after they have been discharged from the hospital. As the emphasis was on normal women the incidence of depression at clinical levels was expected to be low. Consequently, the discussion focusses on depression scores, rather than on observations of clinical depression. Depression was quantified in terms of Beck Depression Inventory (BDI) scores. BDI scores were assessed during the third trimester of pregnancy, during the first week postpartum, and at six weeks postpartum , so that the changes in depression scores could be observed over time. There is a paucity of information regarding the relationship between different postpartum phases in normal women.

It needs to be understood first, if early postpartum depression scores are predictive of later postpartum depression scores; and second if the two postpartum phases share a common aetiology. In this study the first hypothesis predicts that the depression scores of each postpartum phase will be related to a similar cluster of factors, such that a common aetiology can be assumed.

This study focused on depression scores taken during

the first week postpartum and their relationship to depression scores taken in the third trimester of pregnancy, and in the sixth week postpartum. To avoid the "postpartum pinks" phenomenon mentioned by Saks et al., (1985) the early postnatal measure took place on days 5,6, or 7 postpartum.

The second hypothesis related to the predictive ability of depression scores, and was comprised of two components. In the first component it was hypothesized that women who exhibit high BDI scores in the third trimester of pregnancy, would also display high BDI scores in the first and sixth week postpartum. Secondly, it was hypothesized that women who exhibit high depression scores at one week postpartum, would also display high BDI scores at six weeks postpartum.

Besides depression, other factors of interest included: indices of premenstrual tension; stress related factors; degree of social support; and cognitive variables. Although all of these factors have been identified as being pre-cursors to postnatal depression, few have been analized simultaneously over a period of time that spans pregnancy and the puerperium.

The importance of looking at a number of factors in concert is exemplified by the rationale behind the inclusion of a hormonal measure. Although hormonal indices are not seen to have individual predictive potency, this may not be the case when they are combined with other variables. Gelder(1978) argues that hormonal causes should not be considered independently from psychological and social factors, because it is recognized that psychological stimuli affect the neuroendocrine system. Hence, this study examined the relationship between hormonal factors and depression scores in conjuncture with other variables.

Hypothesis three predicted that women who experience difficulty with one hormonally related event

(specifically; premenstrual tension) will be likely to experience difficulty with another (specifically; psychological adjustment in the puerperium). Hence, women who experience higher levels of pre-menstrual tension will have higher BDI scores the first week postpartum than their counterparts who experience low levels of pre-menstrual tension.

A second factor examined is that of stress. In this study the broad category of stress was broken down to include life stress in general (including pregnancy stressors), and birth stress in particular. A Life Experiences Questionnaire was included to identify negative stressors, such as loss of a spouse or loss of a job, that might contribute to the onset of depression.

A birth stress questionnaire was also included for two reasons. First, to see if the postnatal BDI scores were highly correlated with stressors pertaining specifically to the process of having a child; and second, to see if the contradictory results of past studies can be partially resolved. While one group of studies suggest that high birth stress is related to low depression ratings (O'Hara et al., 1982; Paykel et al., 1980; Blumberg, 1980); another study by Pye and McGhie (1981) found that high birth stress scores were positively related to high postpartum depression scores.

Hypothesis four predicted that women who experienced a stressful delivery would have higher BDI scores at each postpartum phase. It was also hypothesized that women who undergo an increased number of life stressors (including pregnancy related stressors), one year prior to birth, would have higher postpartum BDI scores.

The effects of stress can theoretically be mediated by an effective social support system (Paykel, 1979). A social support questionnaire was administered to determine if an absence of social support increased a woman's

susceptibility to the impact of stress. The area of social support was defined according to the extent of a woman's social network. In hypothesis five it was predicted that women who had a low social support system would have higher BDI scores at each postpartum phase, than their counterparts who have an extensive social support system.

Finally, the specific cognitive factor of Mother Efficacy was examined. As very little research has analyzed postpartum depression scores within the context of cognitive factors, it was thought to be an important inclusion in the study. Self Efficacy was generally defined as the ability to see oneself functioning effectively in a mothering role. Hypothesis six predicted that those women who do not forsee themselves as effective mothers would have higher BDI scores at each postpartum phase.

The questionnaires identified as measuring cognitive, hormonal, stress, and social support factors were examined with respect to their relationship to the postpartum BDI scores. Hence, the postpartum BDI scores were defined as the dependent variable. The Beck Depression Inventory was used as a measure of depression, because of its high reliability and validity scores, and because it has been used in numerous other postnatal studies (Manly et al., 1982; Saks et al.,1985; Atkinson and Rickel, 1984; Pye and McGhie, 1981; Olioff and Aboud, 1984), such that a base for comparison existed.

Theories defining how various factors interact to cause depression are still in their infancy, as exemplified by Paykel's model of depression (1969). It is yet to be discerned if factors combine in an additive or interactive manner to produce depression. Furthermore, "the relative potency of factors is unknown. It is possible that a factor, while showing a statistically significant relationship to depression in a

large sample, accounts for only a trivial proportion to its variance" (Pye and McGhie, 1981, p. 50).

Although the study does not deal with the potency of the various factors, it is nevertheless expected that some of the factors will be more powerful predictors than will be others. For example, it is thought that variables relating to depression, stress, and certain cognitions will be the best predictors of the postpartum BDI scores. The study explores the hypothesis that some predictors would be more powerful than others to verify, in part, if future research of this issue would be of value. It is reasonable to assume that if some variables are seen to be more powerful than others future research might attempt to define the relative potency of each factor - and if they combine in an additive or interactive manner.

Despite a variable predictive potency between the factors it is still expected that a combined set of measures predicts the postpartum BDI scores better than any single measure. Hypothesis seven predicts that those women with relatively high postpartum BDI scores will have a preceding higher number of stressors, lower levels of social support, a low sense of self efficacy, and higher levels of premenstrual tension, and pregnancy depression.

METHOD

Recruitment Of Subjects

Subjects were recruited from pre-natal classes given by the Grace Maternity Hospital, the YMCA of Halifax,N.S., and the Metro Birthing Organization. All elligible subjects were approached and given an information sheet about the study (see Appendix IV). Subjects who were willing to be contacted by the researcher signed the sheet, and provided their name, telephone number, and expected date of delivery. The subjects were later contacted by telephone, at which time it was decided when and where the subjects could meet the researcher to complete the first phase of the study. It was emphasized that the subject would be under no obligation to complete the study if she should decide not to continue. The medical doctors attending the subjects were notified that their patients were involved in a study on postpartum depression.

Subjects

A total sample of 37 subjects was recruited from the sources cited above. 19 of the subjects were multiparous, and 18 were primiparous. The study was restricted to those women who were co-habiting with the father of their child, and to those women who were between seven to nine months pregnant. The average age of the subject group was 28.8, with a range of 19 to 36. The sample was largely middle class, with a mean Blishen scale score (Blishen and McRoberts, 1976) of 58.03, representing the third highest

of six class intervals Blishen sets for his scale. Only five women had scores of 39.99 and lower, which placed them in the lowest two class intervals on the scale (see Appendix I). In the entire sample one baby was born prematurely, at 36 weeks. The 37 subjects who completed the study were part of an original group of 42. 3 subjects chose not to complete the study through choice, and 2 through failure to return questionnaires.

Evaluation Instruments

Depression

Beck Depression Inventory. A shortened version of the BDI (Beck, Ward, Mock, Mendelson and Erbaugh, 1961) was used as the primary dependant measure of depression. The categories relating to weight loss and sleep loss were excluded in the statistical analysis because they were confounded with delivery and the infant's early postpartum sleep patterns (Olioff and Aboud, 1983). The test has demonstrated good internal consistency and test-retest reliability (Miller and Seligman, 1973). The scale is commonly used with pregnant and postpartum samples (eg., Manly et al., 1982; O'Hara et al., 1982; Rees and Lutkins, 1971). An example of the questionnaire is presented in Appendix II.

Automatic Thoughts Questionnaire. The ATQ (Hollon and Kendall, 1980) is a 30-item scale that was used as a convergent measure of depression. The test involves a five point scale - ranging from "not at all" to "all the time" - to indicate how often various negative thoughts pop into people's minds. Hollon and Kendall (1980) report

that the ATQ possesses good convergent validity. The test has also demonstrated good internal reliability (Dobson and Breiter, 1983). An example of this test is provided in Appendix II.

Partner's Overall Depression Rating. The PODR (Olioff and Aboud, 1983) was used as a second convergent measure of depression. The PODR was adapted from an overall depression rating constructed by Devins, Binik, Hollomby, Barre, and Guttman (1980), which required husbands to evaluate the intensity and frequency of their wives' depressed affect during the preceding week. The PODR similarly required that the woman's partner give an estimate of the amount of time during the past week that she has been depressed, and to rank on a 9 point scale the intensity of that depression. The partner, in addition, is asked to rank on a 9 point scale how confident his partner is about becoming a mother and about matters in general.

The PODR is an experimental measure, for which reliability and validity data are not yet available. An example of the questionnaire and the address where copies of the questionnaire can be obtained is presented in Appendix II.

Cognitive Variables

Parenting Sense Of Competence Scale. The PSCS (Gibaud-Wallston and Wandersman, 1978) was used as a measure of self-esteem. On 17 items the subject was asked to indicate, by means of a 6 point scale, the extent to which she agreed or disagreed with each of the statements about parenting.

The PSCS has demonstrated high internal consistency, high test-retest reliability, and good

convergent validity (Gibaud-Wallston and Wandersman, 1978). A sample of the questionnaire is provided in Appendix II.

Mother Efficacy Scale. The MES (Olioff and Aboud, 1984) was used to measure a woman's confidence about becoming and being a mother. The test required a woman to list 10 activities she thought good mothers engage in with their babies during the first 6 postpartum months. On a seperate sheet, the woman was asked to check each activity she thought she could carry out well with her own baby during the corresponding period, and to rate her level of confidence on a scale from 10 (quite uncertain) to 100 (certain).

In the sample of 40 primiparous women studied by Olioff and Aboud (1984) Mother Efficacy scores had adequate stability from prepartum to six weeks postpartum ($r=.64$), and were correlated significantly with Hopelessness scale scores both prepartum ($r=[39]= -.50$,$p<.01$) and six weeks postpartum ($r=[39]= -.48$, $p<.01$). (Olioff and Aboud, 1984, p. 9). An example of the test, and an address where the questionnaire can be obtained, are provided in Appendix II.

Hormonal Variables

Moos Menstrual Distress Questionnaire. A shortened version of the Moos Menstrual Distress Questionnaire (MMDQ; Moos, 1968, 1985) was used to measure premenstrual tension. The 47 symptoms listed on the test were shortened to include 19 symptoms that related to pain, negative affect, and behavior change (Olioff and Aboud, 1984). Subjects rated their general experience

of each symptom during the week prior to menstruation from 1 (no experience) to 6 (acute or partially disabling experience).

The MMDQ has demonstrated good internal consistency, high test retest reliability, and good convergent validity (Moos, 1985). A sample of the test is not provided because it is protected by copyrights. An address where the test can be obtained is provided in Appendix II.

Stress

Life Experiences Survey. The LES (Sarason, Johnson and Siegel, 1978) is a 43-item scale that was used to measure the degree of life stress experienced by a woman one year prior to delivery. By means of a 7-point scale, ranging from "extremely negative" to "extremely positive," the impact of each event is indicated. Moderate test-retest reliability is reported at five to six week intervals for the negative change scores, and for the positive change scores (Sarason, Johnson, and Siegel, 1978). A sample of the test is provided in Appendix II.

Pye's Pregnancy Stress Questionnaire. PPSQ (Pye and McGhie, 1981) was used to assess pregnancy stress. The PPSQ lists 16 events which can happen to a woman during pregnancy. With each question a woman is asked to indicate if the event happened to her, and by means of a 4 point scale, how distressing it was.

Pye's Birth Stress Questionnaire. PBSQ (Pye and McGhie, 1981) was used to assess birth stress. The PBSQ lists 10 events which can happen to a woman during delivery. With each question the woman is asked to indicate if the event happened to her, and by means of a 4

point scale, how distressing it was.

The PPSQ and the PBSQ are experimental measures, for which reliability and validity data are not yet available. Examples of the questionnaires are presented in Appendix II, in addition to an address as to where copies of the questionnaires can be obtained.

Social Support

Berkman's Social Support Questionnaire. Berkman's Social Support Questionnaire (BSSQ; Berkman and Syme; 1978) was used to assess the extensiveness of a woman's social network. The BSSQ is composed of 4 questions: the first question deals with how many close friends a women has; the second with how many close relatives; the third with the number of social contacts during a month; and the fourth with group memberships (see Appendix 11 for questionnaire sample).

Berkman and Syme (1979) report that there is an association between the BSSQ and morbidity. Their findings showed that people who lacked social and community ties were more likely to die in the follow-up period than those with more extensive contacts.

In a more recent paper Weiss and Ebert,(1983) reported that the scale was correlated with bulimia in a mixed university-general population. Bulimics reported significantly fewer close relatives that the controls (2.1 $\pm$ 1.9 versus 4.7 $\pm$ 4.0, $t=(28)=2.28$, $p<0.03$).

Olioff,Bryson, and Wadden (1985) found that the BSSQ was predictive of depressive symptoms in undergraduates over a one month interval after initial BDI scores were controlled for in a multiple regression analysis.

Procedure

The study involved 3 phases. Phase I included 7 questionnaires that were completed when the subject was in her last trimester of pregnancy. Phase II included 3 questionnaires that were completed on day 5,6 or 7 postpartum. Phase III included 2 questionnaires that were completed at six weeks postpartum. See Tables 2, 3 and 4 for schedule proceedings.

Phase I

During the initial interview each woman was told that the focus of the study was on the psychological changes that occur with the birth of a child. The subjects were not told that the focus of the study was specifically on postpartum depression, as it was felt that this might bias their responses. In addition, each subject was informed about the number of questionnaires she was required to complete, and the time factor involved. Phase I took between 41 and 76 minutes to complete. On agreeing to participate, each woman was required to complete:

- Beck Depression Inventory;
- Sarason's Life Experiences Survey;
- Pye's Pregnancy Stress Questionnaire;
- The Mother Efficacy Questionnaire;
- An Automatic Thoughts Questionnaire;
- Moos Menstrual Distress Questionnaire;
- Berkman's Social Relationship Questionnaire.

In addition, demographic information including age, occupation, and personal psychiatric history was collected on each subject (samples of the initial interview form, are presented in Appendix V). Also at this time, each woman's partner was given the option of completing a Partner's Overall Depression Rating (PODR), which took

Table 2

Schedule Of Study Proceedings

(3 phases)

Phase I

7 - 9 months pregnant	Estimated completion time
1. Measure of depression	
a. Beck Depression Inventory	10 - 15 minutes
b. Partner's Overall Depression Rating (optional)	3 - 6 minutes
2. Life Stressors one year prior to birth	
a. Sarason's Life Experiences Survey	5 - 10 minutes
3. Pregnancy Stressors	
a. Pye's Pregnancy Stress Questionnaire	8 - 10 minutes
4. Mother Efficacy (2 parts)	
a. Mother Efficacy - Listing Activities	10 - 15 minutes
b. Mother Efficacy - Confidence Ratings	5 - 10 minutes
5. Self Worth	
a. Automatic Thoughts Questionnaire	3 - 5 minutes
6. Hormonal Indices	
a. Moos Menstrual Distress Questionnaire	3 - 5 minutes
7. Social Support System	
a. Berkman's Social Support Questionnaire	3 - 6 minutes
8. Demographic Questionnaire	

Total Time (excluding PODR) - 39 to 76 minutes.

Table 3

Schedule Of Study Proceedings

Phase II

days 5,6,7 postpartum	Estimated completion time
1. Measure Of Depression	
a. Beck Depression Inventory	10 - 15 minutes
b. Partner's Overall Depression Rating (optional)	3 - 5 minutes
2. Birth Stressors	
a. Pye's Birth Stress Questionnaire	10 - 15 minutes
3. Mother Efficacy	
a. Mother Efficacy - part II	5 - 10 minutes

Total time (excluding PODR) - 28 - 45 minutes

Table 4

Schedule Of Study Proceedings

Phase III

6 weeks postpartum	Estimated completion time
1. Measure of Depression	
a. Beck Depression Inventory	10 - 15 minutes
b. Partner's Overall Depression Rating (optional)	3 - 6 minutes
2. Measure of Parenting Competence	
a. Parent's Sense Of Competence Scale	7 - 9 minutes

Total Time (excluding PODR) - 20 to 30 minutes.

between 3 - 6 minutes to complete. 13 men completed the PODR in each phase of the study.

During the first phase it was necessary to personally guide each subject through completion of the questionnaires to ensure that a sufficient amount of time passed between the completion of the first and second part of the Mother Efficacy Questionnaire. At the conclusion of the initial interview, each subject was given two packages containing the questionnaires for Phases II and III, in stamped return envelopes. They were told that they would be contacted when each set of questionnaires should be completed. During the interim, between phases I and II the subjects were contacted by phone to maintain their interest in the study, and to follow up on correct mailing addresses.

Phase II

The second phase involved establishing contact with the subjects, between days five to seven postpartum. It had been decided beforehand that those women whose babies suffered severe birth difficulties would be given the option of discontinuing the study, because it seemed unfair to burden a mother with questionnaires if she was overly concerned about her child's health. A woman would have been asked if she wished to continue in the study, if her child was determined to meet any of the following criteria:

-Birth weight less than 1,600 g.
-Gestational age less than 33 weeks.
-Continuing or developing signs of respiratory distress syndrome.
-Asphyxiation (apgar score of less than 6 at 5 minutes).

-Cyanosis or suspected cardiovascular disease.
-Major congenital malformations requiring surgery or catheterization.
-Convulsions, sepsis, hemorrhage disthesis, or shock.
-Meconium aspiration syndrome. (Blumberg, 1980).

None of the women in the study had babies that met Blumberg's criteria.

Each subject was contacted by phone during the designated time period and guided through the completion of the second BDI; Pye's Birth Stress Questionnaire; and the second Mother Efficacy Questionnaire. Completion of the tests took between 22 to 35 minutes. The subject's partner was again given the option to complete the PODR. The completed questionnaires were returned to the researcher by mail. During the interim, between Phases II and III, contact was made with the subjects by phone. Phoning was deemed necessary to maintain the subjects' interest in the study, and also to follow-up on correct mailing addresses.

Phase III

At six weeks postpartum each subject was again contacted by phone. The subjects were guided through the completion of the third BDI, and the Parenting Sense of Competence Scale - which together took between 20 to 30 minutes to complete. Again, the subject's partner was given the option of completing a PODR.

The completed questionnaires were returned to the experimenter by mail. Phase III marked the end of the subjects' involvement in the study. Following data analysis each subject will be provided with a written statement of the general conclusions of the study.

According to the criterion of the study subjects that had BDI scores between 10 to 12 were described as mildly depressed; subjects that had BDI scores between 13 to 16 were defined as moderately depressed; while those subjects with BDI scores of 17 and greater were defined as clinically depressed, and were referred to mental health professionals for psychological treatment. In addition, the medical doctors of subjects were informed when one of their patients scored 17 or more on the BDI.

Statistical Analysis Of Data

Forward Regression

Hypotheses two through six list a variety of factors that are thought to be related to the onset of postpartum depression. Forward regression was used as a means of exploring if, indeed each, of these variables did predict postpartum depression, and if so, to what degree. Two forward regressions, using the Statistical Package for the Social Sciences (SPSS), were used to analyse the relationship between the dependent variables and the questionnaire scores. In the first multiple forward regression ten independent variables were regressed on the first dependent variable, which was the Beck Depression scores completed in Phase II. The ten independent variables included the first BDI; the Life Experiences Survey; Pye's Pregnancy Questionnaire; Moos Menstrual Distress Questionnaire; the Automatic Thoughts Questionnaire; the first and second Mother Efficacy Questionnaires; Berkman's Social Support Measure; Pye's Birth Stress Questionnaire; and the measure of a Parent's Sense Of Competence. In the second multiple regression the same ten independent variables including the second BDI, were regressed on the BDI scores completed in Phase

III. The data did not violate any of the underlying assumptions of multiple regression.

Stepwise Regression

Stepwise regression was used as a means of exploring hypothesis one, which states that each postpartum phase would share a common set of factors; and hypothesis seven, which states that a combined set of measures predicts postpartum depression better than any single measure. Stepwise regression was a means of exploring what subset of available predictor variables would yield an optimal prediction equation. In stepwise regression the order of inclusion is determined by the respective contribution of each variable to explained variance. Each of the independent variables are entered one by one into the equation, on the basis of a pre-established statistical criteria. The criteria are established in the parameter specification.

Comparison of Primiparous and Multiparous Groups

T-tests were used to see if any significant differences existed between the primiparous and the multiparous groups and the main sample. Although there were relatively equal numbers of multiparous and primiparous (N=18, N=19) women in the study, it was not possible to compare the two groups using multiple regression techniques. The small number of subjects and the relatively large number of variables would lead to unstable regression equations.

RESULTS

Summary

The hypotheses regarding the relationship between the postpartum scores and the various predictors were partially supported by the results. The BDI scores taken the first week postpartum (BDI II) were significantly related to the BDI scores taken during pregnancy; to birth stresses; to a mother's sense of efficacy; and to pre-menstrual tension. The BDI scores taken at six weeks postpartum were significantly related to the BDI II scores, and to general life stress scores.

As was hypothesized a combined set of measures predicted the postnatal BDI scores better than any single measure. However, the results from two forward multiple regressions indicated that some variables were better predictors than others. Mother Efficacy was the best predictor of the BDI II scores, followed by pregnancy depression scores, and birth stressors. The BDI II scores were the best predictor of the BDI III scores, followed by life stressors.

Means And Standard Deviations Of Measures

The means and standard deviations of the measures are shown in Table 5. Depression scores, as measured by the Beck Depression Inventory (BDI), were highest during pregnancy ($\bar{X}$ = 4.5). In the early postpartum period the mean score dropped ($\bar{X}$ = 3.6), to remain constant at six weeks postpartum ($\bar{X}$ = 3.59).

Table 5

MEANS AND STANDARD DEVIATIONS OF MEASURES ACROSS TIME

Measure		7-9 months pregnant	5-7 days postpartum	6 weeks postpartum
Beck Depression Inventory *	$\bar{x}$	4.50	3.6	3.59
	s.d.	3.55	5.19	5,23
	N	37	37	37
Life Experiences Survey	$\bar{x}$	5.48		
	s.d.	5.18		
	N	37		
Pregnancy Stress Questionnaire	$\bar{x}$	5.83		
	s.d.	4.69		
	N	37		
Moos Menstrual Distress Questionnaire	$\bar{x}$	33.21		
	s.d.	11.06		
	N	37		
Automatic Thoughts Questionnaire	$\bar{x}$	38.72		
	s.d.	9.53		
	N	37		
*Mother Efficacy	$\bar{x}$	90.83	91.48	
	s.d.	9.93	10.13	
	N	37		
Berkman's Social Support Questionnaire	$\bar{x}$	2.70		
	s.d.	0.66		
	N	37		

Table 5 con't

MEANS AND STANDARD DEVIATIONS OF MEASURES ACROSS TIME.

Measure		7-9 months pregnant	5-7 days postpartum	6 weeks postpartum
Pye's Birth Questionnaire	$\bar{x}$		5.43	
	s.d.		5.19	
	N		37	
Parent's Sense of Competence	$\bar{x}$			77.21
	s.d.			11.37
	N			37

* Two items were eliminated from the BDI measures because they were not considered appropriate for measuring depression in a postpartum sample, i.e. sleep loss and weight loss.

Convergence of Measures for Depression and Self-Esteem

The intercorrelations among variables are presented in Tables 6 and 7. The scores from the Partner's Overall Depression Rating (PODR) were used as a convergent measure of depression. The BDI and PODR scores taken during pregnancy were not significantly correlated. However, the test scores were significantly correlated in the early postpartum, $r = .83$, and the later postpartum, $r = .73$ (Table 6).

The Automatic Thoughts Questionnaire, which was also used as a convergent measure of depression, was significantly correlated to the first set of BDI scores, $r = .68$; to the second set of BDI scores, $r = .64$; and to the third set of BDI scores, $r = .50$ (Table 7).

The Parenting Sense Of Competence Scale (PSCS) was used as a convergent measure of a Mother's Self-Esteem, along with the Mother Efficacy Questionniare (MEQ). The PSCS scores were significantly correlated to the MEQ scores taken in the early postpartum, $r = .52$, and to the MEQ scores taken at six weeks postpartum, $r = .56$ (Table 7).

Incidence Of Depression

Cases of depression were defined by applying criterion cut-off scores to the BDI: mild depression included scores of 10 to 12; moderate depression included scores of 13 to 16; and clinical depression included scores of 17 and up (Pye and McGhie, 1981). Table 8 summarizes the incidence of data for each phase of the study.

The largest number of cases of depression, at all severity levels, occurred in the last trimester of pregnancy (10.8%). The highest rate of Moderate Postpartum Depression also was seen to occur in the third

Table 6

CORRELATIONS BETWEEN
PARTNER'S RATING OF DEPRESSION (PROD)
AND THE BDI SCORES

Variable	N	r	level
BDI scores and PROD scores taken during pregnancy	13	.36	.20
BDI scores and PROD scores taken 5-7 days postpartum	13	.83	.001
BDI scores and PROD scores taken 6 weeks postpartum	13	.73	.01

Table 7

CORRELATION MATRIX OF THE INDEPENDENT VARIABLES

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	BDI #1											
2.	BDI #2	.567										
3.	BDI #3	.545	.721									
4.	Life Experiences	.540	.410	.427								
5.	Pregnancy Stress	.601	.457	.448	.516							
6.	Moos Menstrual Distress	.169	.521	.342	.180	.182						
7.	Automatic Thoughts	.684	.649	.505	.547	.540	.241					
8.	Mother Efficacy 1	-.335	-.709	-.429	-.053	-.161	-.500	-.505				
9.	Mother Efficacy 2	-.423	-.759	-.581	-.316	-.197	-.503	-.532	.668			
10.	Berkman's Social Support	-.469	-.247	-.204	-.362	-.150	.093	-.419	.068	.192		
11.	Birth Stress	.161	.361	.549	.248	.392	.290	.151	-.173	-.250	-.018	
12.	Parent Competence	-.274	-.652	-.608	-.183	-.301	-.496	-.487	.525	.566	-.021	-.265

Table 8

CUMULATIVE INCIDENCE OF DEPRESSION AT 3 LEVELS OF SEVERITY

		Pregnancy 7-9 months pregnant BDI #1	Postpartum Days 5,6,7 BDI #2	Postpartum 6 weeks BDI #3
Clinical BDI 17+	N	0	1	2
	cum.%	0	2.70	5.41
Mod + Clinical BDI 13+	N	3	2	2
	cum.%	8.10	5.40	5.41
All Dep BDI 10+	N	4	2	2
	cum.%	10.8	5.41	5.41
	N	37	37	37

Clinical - clinical severity depression

Mod - moderate severity depression

Dep - depressions

trimester of pregnancy (8.10%). Severe depressions however, occurred most frequently at six weeks postpartum (5.4%), and then at one week postpartum (2.7%). No depressions of clinical severity were noted during the third trimester of pregnancy.

Hypothesized Predictors Of Postpartum Depression

Hypothesis 1 through 7 specify the predictors believed to be related to the onset of the postpartum BDI scores. Results of the analysis conducted to test hypotheses 1 through 6 are summarized in Tables 9 and 10. The data did not violate any of the underlying assumptions of multiple regression.

Hypothesis 1: Aetiology

Hypothesis 1, which predicted that each set of postpartum BDI scores would be related to a similar cluster of factors, was supported. Each set of postpartum BDI scores were generally associated with high depression scores and high stress scores. More specifically, the forward regression equation indicated that the BDI II scores were best predicted by the first set of Mother Efficacy Scores (ΔR^2=.369), the BDI scores taken during pregnancy (ΔR^2=.165), and the Birth Stress scores (ΔR^2=.099). These three factors explained 63.3% of the variance in the BDI II scores (refer to Table 11). The BDI III scores were best predicted by the BDI III scores (ΔR^2=.709), and life stress scores (ΔR^2=.056), accounting for 76.6% of the variance (refer to Table 12).

Hypothesis 2: Depression Scores

Hypothesis 2 was comprised of two parts. First, it was seen if the pregnancy BDI scores were predictive of

Table 9

MULTIPLE FORWARD ON BDI #2

Variable	Beta Weights	T-ratio	Probability
Parent Competence	-.120	-.877	N.S.
BDI # 1	.295	1.755	*
Birth Stress	.271	1.915	*
Mother Efficacy 2	.205	1.568	N.S.
Moos	.262	2.097	**
Life Experiences	-.112	-.800	N.S.
Social Support	-.126	-.988	N.S.
Mother Efficacy 1	-.431	-3.050	****
Pregnancy Stress	.032	.207	N.S.
Automatic Thoughts	.196	1.163	N.S.

N = 35

Multiple R = .867

R square = .751

Adjusted R square = .633

Standard error = 1.651

* $p < 0.050$
** $p < 0.025$
*** $p < 0.010$
**** $p < 0.005$

Table 10

MULTIPLE FORWARD ON BDI #3

Variable	Beta Weights	T-ratio	Probability
BDI # 1	.174	1.221	N.S.
Birth Stress	.126	1.256	N.S.
Mother Efficacy 2	-.093	-.646	N.S.
Moos	-.133	-1.217	N.S.
Life Experiences	.162	1.342	***
Social Support	-.006	-.056	N.S.
Mother Efficacy 1	.138	.946	N.S.
Pregnancy Stress	-.020	-.148	N.S.
Automatic Thoughts	-.011	.072	N.S.
BDI #2	.579	3.113	****

N = 36

Multiple R = .912

R square = .831

Adjusted R square = .753

Standard error = 2.118

* p < 0.050
** p < 0.025
*** p < 0.010
**** p < 0.005

the BDI II and the BDI III scores; secondly, if the BDI II scores were predictive of the BDI III scores.

The first part of the hypothesis was partially supported. Depression scores taken during pregnancy were significantly related to the BDI II scores ($p<0.05$), but not to the BDI III scores. Refer to Tables 9 and 10.

The second part of the hypothesis was supported. The BDI II scores were significantly related to the BDI III scores ($p<0.005$). Refer to Table 10.

Hypothesis 3: Pre-menstrual tension scores

Hypothesis 3, which predicted that those women who exhibited high scores on the Moos Menstrual Distress Questionnaire (MMDQ) would have higher BDI II scores, was supported. Scores from the MMDQ were significantly related to the BDI scores taken in the early puerperium ($p<0.025$). (See Table 9).

Hypothesis 4: Stress Scores

Hypothesis 4 dealt with the broad category of stress, and was broken down to include life stress in general (including pregnancy stressors), and birth stress in particular. Hypothesis 4 was partially supported.

General life stress scores were not significantly related to the BDI scores in the early puerperium, but they were significantly related to the BDI scores taken at six weeks postpartum ($p<0.01$). Refer to Table 10. Pregnancy Stress was not significantly related to either set of BDI scores.

Birth Stress scores were significantly related to the BDI scores in the early puerperium ($p<0.05$), but not to the BDI scores at six weeks postpartum, (see Tables9 and 10).

Hypothesis 5: Social Support Scores

Hypothesis 5 predicted that women who did not have a lot of social support would have higher BDI scores at each postpartum phase. Hypothesis 5 was not supported. Scores from Berkman's Social Support Questionnaire were not significantly related to either set of BDI scores (Refer to Tables 9 and 10).

Hypothesis 6: Mother Efficacy Scores

Hypothesis 6 predicted that women who do not forsee themselves as effective mothers would have higher BDI scores at each postpartum phase. Hypothesis 6 was partially supported.

The Mother Efficacy Scores taken during pregnancy were significantly related to the BDI-II scores ($p<0.005$), (Refer to Table 9). However, neither set of Mother Efficacy scores were significantly related to the depression scores taken at six weeks postpartum.

Hypothesis 7: Cumulative Factors Having Greater Predictability

In addition to the two multiple regressions mentioned previously, the scores were also analyzed by stepwise regression, to determine the respective contribution of each variable to the explained variance.

The Mother Efficacy scores taken during pregnancy were the best predictor of the BDI II scores, accounting for 36.91% of the explained variance. The BDI scores taken during pregnancy were the second best predictor, accounting for 16.5% of the variance in the early postpartum depression scores. Birth Stress was the third best predictor of the BDI II scores accounting

for 9.9% of the variance. Inclusion of the remaining variables accounted for an additional 11.84% of the variance; increasing the R-squared from .63299 to .75143 (See Table 11).

The BDI II scores were the best predictor of the BDI III scores, accounting for 70.7% of the variance. Life stressors, as measured by Sarason's Life Experiences Survey, were the second best predictor, accounting for 5.7% of the variance. Together these two variables accounted for 76.4% of the variance. Inclusion of the remaining measures accounted for an additional 6.6% of the variance; increasing the R-squared from .76405 to .83091 (See Table 12).

The data from the stepwise regressions lend support to hypothesis 6. A combined set of measures accounts for more variability in the second and third set of BDI scores than does a single measure.

Predictive Contributions Of Incidental Variables

The relationship between incidental variables and postpartum depression scores was also examined. The incidental variables which included - social economic status of the mother; age of the mother; parity of the mother; psychiatric history of the mother; and sex of the baby - were not expected to show a relationship to either set of BDI scores.

The 't' test was used for variables with continuous distribution: in particular the social economic status of the subject, or of her partner, and the age of the subject. Of the continuous incidental variables that were examined only social economic status showed a significant relationship with the BDI scores taken during pregnancy ($p<.05$) (See Table 13).

The chi-squared statistic was used to test

Table 11

THREE MOST PREDICTIVE FACTORS
FOR EARLY POSTPARTUM DEPRESSION
(BDI #2)

Variable	Beta Weights	T-ratio	Probability
Mother Efficacy 1	-.540	-4.912	**
BDI #1	.394	-3.580	**
Birth Stress	.316	2.896	*

N = 35

Multiple R = .796

R square = .633

Adjusted R square = .597

Standard error = 1.728

* $p < 0.005$
** $p < 0.0005$

Table 12

TWO MOST PREDICTIVE FACTORS FOR EARLY POSTPARTUM DEPRESSION (BDI #3)

Variable	Beta Weights	T-ratio	Probability
BDI #2	.734	-7.806	**
Life Experiences	.260	2.767	*

N = 36

Multiple R = .875

R square = .766

Adjusted R square = .751

Standard error = 2.151

* $p < 0.005$
** $p < 0.0005$

Table 13

RELATIONSHIP BETWEEN INCIDENTAL CONTINOUS VARIABLES AND POSTPARTUM SCORES ACROSS TIME

Variable	BDI taken	t-value **	Degrees of freedom	Probability
SES of mother	during pregnancy	-2.37	35	.05
SES of mother	5-7 days postpartum	-1.94	35	N.S.
SES of mother	6 weeks postpartum	-1.22	35	N.S.
Age of mother	during pregnancy	-1.23	35	N.S.
Age of mother	5-7 days postpartum	-1.03	35	N.S.
Age of mother	6 weeks postpartum	.25	35	N.S.

** Note : T values based on pooled variance estimates.

categorical variables by comparing depressed and non-depressed postpartum subjects. None of the categorical variables - specifically, parity and psychiatric history of the mother, and the sex of the baby - showed a significant relationship to the BDI scores (Refer to Table 14).

Comparison Of Multiparous and Primiparous Groups

The main sample was divided relatively equally into multiparous (N=19) and primiparous (N=18) groups. T-tests were used to determine if any significant differences existed between the primiparous and multiparous groups.

Significant differences did exist between the multiparous and primiparous groups on three measures: the first set of Mother Efficacy scores ($t=-2.542$); the second set of Mother Efficacy scores ($t=-2.213$); and the Birth Stress scores ($t=3.002$)(Refer to Table 15).

Subjects that Did Not Complete The Study

Altogether, there were five subjects that did not complete the study: two subjects returned the questionnaires which were subsequently lost in the mail system; and three subjects chose not to return the questionnaires. The 't' test, based on pooled variance estimates, was used to determine if the subjects that did not complete through choice differed significantly from the subjects that did complete. The results are provided in Table 16. On the Pregnancy Stress Questionnaire; the Moos Menstrual Distress Questionnaire; the Automatic Thoughts Questionnaire; the Mother Efficacy Questionnaire; and the Berkman's Social Support Questionnaire, no significant differences were found between the two groups. A significant difference did exist between the

Table 14

DIFFERENCE OF CATEGORICAL INCIDENTAL VARIABLES BETWEEN DEPRESSED AND NON-DEPRESSED POSTPARTUM SUBJECTS
(at 6 weeks postpartum)

Variable	Chi-square	Degrees of freedom	Probability
Parity of mother	0.000	1	N.S.
Sex of baby	1.270	1	N.S.
Psychiatric history	.263	1	N.S.

Table 15

COMPARISON OF PRIMIPAROUS AND MULTIPAROUS GROUPS

(Group A - primiparous n=18.....Group B - multiparous n=19

Test	Group Mean	Group Std.Dev.	t-value based on pooled variance estimates	Probability
BDI #1				
Group A	4.72	4.62	.211	N.S.
Group B	4.47	2.20		
BDI #2				
Group A	5.11	6.99	1.782	N.S.
Group B	2.15	1.77		
BDI #3				
Group A	4.72	6.99	1.440	N.S.
Group B	2.31	2.00		
Life Experiences Survey				
Group A	5.00	5.58	-.704	N.S.
Group B	6.26	5.33		
Pregnancy Questionnaire				
Group A	6.16	4.49	.410	N.S.
Group B	5.52	4.51		
Moos Menstrual Questionnaire				
Group A	36.61	11.20	1.880	N.S.
Group B	30.00	10.20		
Automatic Thoughts Questionnaire				
Group A	39.94	11.10	.750	N.S.
Group B	37.57	7.93		
Mother Efficacy I Questionnaire				
Group A	86.66	12.30	-2.542	.01
Group B	94.36	4.60		
Mother Efficacy II Questionnaire				
Group A	87.88	12.90	-2.213	.03
Group B	94.89	4.91		

Table 15 (cont'd)

COMPARISON OF PRIMIPAROUS AND MULTIPAROUS GROUPS

(Group A - primiparous n=18.....Group B - multiparous n=19

Test	Group Mean	Group Std.Dev.	t-value based on pooled variance estimates	Probability
Berkman's Social Support				
Group A	2.77	.647	.180	N.S.
Group B	2.73	.733		
Birth Stress Questionnaire				
Group A	7.50	4.71	3.002	.004
Group B	3.15	4.09		
Parent Competence				
Group A	73.88	12.90	-1.784	N.S.
Group B	80.36	8.98		

two groups on the first Beck Depression Inventory ($p < .01$) (Table 16).

The scores of those subjects that did not complete the questionnaires because of mail failure are provided in Table 17.

Table 16

SCORES OF SUBJECTS THAT DID NOT COMPLETE THROUGH CHOICE COMPARED TO MAIN GROUP SCORES

(Group A - main group n=37....., Group B - incomplete group n=3)

Test	Group Mean	Group Std.Dev.	t-value **	Degrees of Freedom	Probability
BDI #1					
Group A	4.59	3.54	3.08	38	.01
Group B	11.33	5.13			
Life Experiences Survey					
Group A	5.49	5.18	-1.80	38	N.S.
Group B	11.33	8.62			
Pregnancy Questionnaire					
Group A	5.84	4.69	-0.53	38	N.S.
Group B	7.33	4.16			
Moos Menstrual Questionnaire					
Group A	33.2	11.1	0.18	38	N.S.
Group B	32.0	14.5			
Automatic Thoughts Questionnaire					
Group A	38.7	9.53	-0.97	38	N.S.
Group B	44.3	11.1			
Mother Efficacy Questionnaire					
Group A	90.8	9.96	-0.14	38	N.S.
Group B	91.7	7.23			
Berkman's Social Support					
Group A	2.7	.661	0.94	38	N.S.
Group B	2.3	.577			

** Note: t-values based on pooled variance estimates

Table 17

SCORES OF SUBJECTS THAT DID NOT COMPLETE BECAUSE OF MAIL FAILURE

Measure	Subject 1	Subject 2
BDI #1	2	5
BDI #2	-	3
BDI #3	3	-
LES	3	3
PQ	3	2
MMDQ	30	42
AT	22	35
ME #1	87	98
ME #2	-	88
Berkman's SSQ	3	3
P BSQ	-	12
PSC	84	-

DISCUSSION

As was hypothesized the BDI scores taken during the first week postpartum (BDI II) were significantly related to a broad range of factors including Mother Efficacy; Pregnancy BDI scores; Birth Stress; and Pre-menstrual Tension. It was expected that the BDI scores taken at six weeks postpartum (BDI III) would be similarly associated with several variables, but instead the BDI II scores and Life Stressors were the only two significantly predictive factors. Another finding, contrary to expectations, was that neither Pregnancy Stress nor Social Support were significant predictors of either set of postpartum BDI scores.

Support was given to the hypothesis that a combined set of measures predicted postpartum BDI scores better than any single measure.

One reason why only partial support may have been found for the hypotheses, is that this study analyzed data from both primiparous and multiparous women - whereas other comparative studies focused just on primiparous samples (Pye and McGhie, 1981; Olioff and Aboud, 1984).

For this reason the main sample was subdivided into a multiparous group (N=19) and a primiparous group (N=19), which were then compared to the main group scores (see Table 15).

Depression Scores

The average scores for depression shown in Table 5 reflect normal changes in mood occurring in pregnancy and the puerperium, at least for samples that are similar to the one being studied.

Group mean depression scores were highest during pregnancy. Other studies have similarly found high depression scores occurring during pregnancy (Pye and McGhie, 1981; Olioff and Aboud, 1984; O'Hara et al., 1982). The results from this study, and others, challenge the notion promoted by more traditional theorists (eg., Deutsch, 1947) that pregnancy is a time of fulfillment and calm for women. Instead, it is seen as a time when women are at risk for emotional difficulties, and possibly worthy of study in its own right.

Increased Risk For Severe Depression In The Postpartum

Although women were seen to be at greater risk for depression of any severity during the third trimester of pregnancy, the greatest risk for depression of clinical severity was seen to occur at six weeks postpartum (Table 8) which demonstrates the cumulative incidence of depression. Other studies that have measured severity of depression have similarly found that more depressions of clinical severity occur in the postpartum (Pitt, 1968; Rees and Lutkins, 1971; Pye and McGhie, 1981).

In this study the highest risk for depression of any severity was shown by subjects in the last trimester of pregnancy (10.8%); and the highest risk for depressions of clinical severity was shown by subjects at six weeks postpartum. From a sample size of 37 subjects 5.4% were seen to experience depression of clinical proportions at six weeks postpartum.

An unfortunate implication of the finding that severe depressions are more likely to occur later in the postpartum is that this is a time when most women have little contact with the medical community. Medical check-ups that occur frequently during pregnancy are usually discontinued after delivery. One possible

solution to this dilemma is to identify women at risk for depression during their pregnancy, so that medical support can be sustained if necessary.

Factors Related To Postpartum Depression

Pregnancy BDI Scores

In this study pregnancy BDI scores were significantly related to the BDI II scores. The results from this study are comparable to those completed by Pye and McGhie (1981) and Olioff and Aboud (1984). One possible interpretation of this finding is that the trend identified in the pregnancy BDI scores continues into the postpartum - and is reflected in the BDI scores taken in the early puerperium. Verification of this hypothesis would entail looking at the psychological profiles of a sample of women before pregnancy and after delivery. Various stages of the postpartum should be examined to see if similarities are observed.

Some studies have identified a strong relationship between pregnancy depression scores and depression scores taken later in the puerperium (Pye and McGhie, 1981; Manly et al., 1982; Olioff and Aboud, 1984). However, contrary to much of the literature, this study did not find a significant relationship between pregnancy BDI scores and BDI scores taken later in the puerperium. One possible explanation for this discrepancy is the difference in samples: while this study includes data from both primiparous and multiparous women, the other studies included only primiparous women.

It is plausible that the depression experienced during pregnancy by primiparous and multiparous women is based on different factors with different resolutions. Depression in multiparous women might be related to the

circumstance of already having a child (or children) to take care of while being pregnant. In comparison, depression in primiparous women might be related to the anxiety about the novelty of becoming a mother. The depression experienced by first time mothers might take more time to resolve because they do not have the benefit of experience to assuage the anxiety of new events; whereas second (or third) time mothers can use their experience to cope with the eventualities of childcare.

The comparison in this study of primiparous and multiparous scores did not support the idea that there are differences in the depression experienced by each group - (Table 15).

BDI Scores Taken the First Week Postpartum

This study is consistent with other studies that have similarly found a significant relationship to exist between the depression scores taken in the early puerperium, and depression scores taken in the later puerperium (Kendall, 1981; Olioff and Aboud, 1984). Also consistent with these studies is the finding that depression levels during the early postpartum are not as high as those seen to occur during pregnancy. The decline in depression levels might be an effect of the "postpartum pinks" - as mentioned by Saks et al., (1985). The depression experienced soon after delivery might possibly be abated somewhat by the intensity and wonder of the event. In either regard, it still remains that early postpartum depression is a significant predictor of later postpartum depression, and because of this should not be disregarded as a benign and fleeting condition.

Pre-Menstrual Tension

Early postpartum depression has been regarded as a benign and fleeting condition largely because of the theorists that have speculated about its hormonal basis (Yalom et.al., 1968; Pitt, 1973, 1982; and Dalton, 1971). According to the endocrine theorists early postpartum depression declines simultaneously with the drop in certain hormonal levels. Although such theories have been logically and empirically discounted (Gedden, 1978; Steiner, 1978; Nott et al., 1976) there is still some evidence to suggest that a link exists between pre-menstrual tension and early postpartum depression.

This study is consistent with other studies in its finding that pre-menstrual tension is associated with depression scores taken early in the puerperium (Nott et al., 1978; Yalom et al., 1968). The hypotheses that women who experience depression early in the postpartum might be more sensitive to hormonal fluctuations must remain as speculation until the mechanisms underlying hormonal sensitivity are understood.

The importance of pre-menstrual tension as a predictive variable should be regarded with some reserve. When a stepwise regression was used to compare the relative contribution of the variables, pre-menstrual tension was not seen as a significant predictor. Mother efficacy scores, pregnancy depression scores, and birth stress scores were significantly better predictors of the BDI II scores than was pre-menstrual tension.

Self-Efficacy

For the purposes of intervention it is an optimistic finding that hormonal variables are not as significantly related to the BDI scores as are certain cognitive factors. The results from this study regarding the importance of mother efficacy are supported, in part, by

those of Olioff and Aboud's (1984). Olioff and Aboud found that "specific prepartum negative expectations about the future (Mother Efficacy) significantly predicted one week postpartum BDI scores" (Olioff and Aboud, 1984, p. 20). This study similarly found that Mother Efficacy scores were the best predictor of BDI scores on days 5,6 or 7 postpartum. Intuitively it seems more likely that a woman has greater opportunity to effect positive change over her sense of self efficacy, than she does over her hormonal levels. For this reason the identification of cognitive variables in a predisposing role offers the opportunity to encourage positive control and change. It would be interesting to determine if cognitive interventions that focused on increasing self efficacy functioned to decrease early postnatal depression scores.

There is some evidence that cognitive intervention strategies might also be a relevant means of decreasing later postnatal depression. Olioff and Aboud (1984) also found Mother Efficacy scores to be the best predictor of BDI scores taken at six weeks postpartum. The fact that this study did not find the two variables to be significantly related might again be explained by the difference in sample types. The results from this study might be confounded by the examination of data from both primiparous and multiparous women - as opposed to just a primiparous group, as was done by Olioff and Aboud.

It seems reasonable to hypothesize that the underlying causes of a woman's uncertainty about becoming a mother would be different in first and second time mothers. The low mother efficacy scores of primiparous women may reflect the difficulty they have in perceiving themselves as mothers. Multiparous women may instead question their ability to manage a newborn in addition to another child (or children). One could hypothesize

further that the childcare experience of multiparous womenhelps them to resolve their difficulties, perhaps more quickly than primiparous women, who are faced with developmental changes without the benefit of experience.

The comparison in this study of primiparous and multiparous groups did support the idea that there are differences in the self efficacy scores of each group (see Table 15). The primiparous and multiparous groups were significantly different on both the first and second measures of Mother Efficacy. To understand more fully how the dynamics of self efficacy function in a primiparous and a multiparous group a prospective design is needed that compares each group on other cognitive variables.

Stress

General Life Stress

The issue of sample types influencing the results is also relevant in the discussion of general life stress and its relationship to the postpartum depression scores. This study's identification of a relationship between stressful life events and the BDI scores taken later in the puerperium is similar to the outcome of other studies that also define life stress in terms of the number and/or the magnitude of life events (O'Hara et al., 1982; Paykel et al., 1980). However, these results are at odds with those of Olioff and Aboud (1984), who found that life stress was not predictive of BDI scores taken at six weeks postpartum. The focus of Olioff and Aboud's study was on a primiparous sample - whereas the other previously mentioned studies, had samples that included both primiparous and multiparous women.

Olioff and Aboud (1984) argue that analyzing the data

from both primiparous and multiparous women masks a critical difference between the two groups. Their supposition of a critical difference is substantiated by Grossman et al., (1980) who found that life stress was predictive of postpartum depression in multiparous women, but not in primiparous women. Grossman et al., suggest that primiparous women may be less affected emotionally by life events because they are so engrossed in the novel experience of becoming mothers.

In this study no significant differences were found between the primiparous and multiparous groups when they were compared on the Life Stress scores (refer to Table 15).

Birth Stress

The idea that primiparous and multiparous women may be distinct in their perception of pregnancy and delivery is again, a possible explanation for the outcome in regard to Birth Stress. The results indicated that Birth Stress was the third best predictor of the BDI II scores, but was not predictive of the BDI III scores. In a comparative study Pye and McGhie (1981) found that Birth Stress was significantly related to depression at one month postpartum. The finding by Pye and McGhie may again be a function of their analysis of a primparous sample. The delivery process may be more stressful for first time mothers because they are confronted with an unknown event, and because first time deliveries tend to be longer and more intense than subsequent ones. The intensity of birth may have implications for recovery time. Possibly first time mothers take longer to recover psychologically than do second time mothers. Hence - the results from this study may again be confounded by the examination of a mixed multiparous and primiparous group.

When the main group of this study was divided into primiparous and multiparous groups a difference was seen to exist on the Birth Stress scores (see Table 15). To define more accurately how each group responded to birth stress a comparison study needs to be completed.

In either regard - such theoretical considerations should not detract from the finding that Birth Stress is an important predictive factor. Important because Birth Stress can be readily discerned at an optimal time. The confinement of most women to a hospital following delivery provides the opportunity to assess Birth Stress.

Pregnancy Stress

Pregnancy Stress was not significantly related to either set of postpartum BDI scores. However, Pye and McGhie (1981), who studied a primiparous sample, found that life stress during pregnancy contributed significantly to depression scores at one month postpartum. Again, the discrepancy in results may be due to differences between primiparous and multiparous women. Perhaps second (or third) time mothers find pregnancy less stressful because experience lets them put certain events into perspective. As an example, experience enables multiparous women to judge what physiological changes are a normal part of pregnancy.

No significant differences were seen to exist in this study between the primiparous and the multiparous group on the measure of pregnancy stress.

Social Support

Social support was not seen to contribute significantly to either set of postpartum BDI scores. This finding is consistent with other studies that

similarly did not identify social support as being significantly related to psychological difficulties after delivery (Pye and McGhie, 1981; Nuckolls et al., 1972). Although this study is further confirmation that social support is not a predictive factor of postpartum depression, there still remains the possibility that it could play an indirect role. Nuckolls et al., (1972) see limited social support as possibly increasing a woman's vulnerability to postpartum depression, as opposed to being directly responsible for its onset.

As the concept of vulnerability was not discussed in this study questions regarding its relationship to post-partum depression cannot be answered. Future studies on postpartum depression might want to explore possible interrelationships between stress and vulnerability, and how their possible interraction might predispose a woman to postnatal depression.

Cumulative Effects

As was hypothesized, the results indicate that the postpartum BDI scores are best predicted by a combination of factors rather than a single measure. Meaning that a woman who experiences several of the predictive factors is at greater risk for experiencing higher postnatal BDI scores than is her counterpart who experiences only one or two of the factors. The practical implication of this finding is that a more accurate assessment of a woman's vulnerability for having high BDI scores in the postpartum would be best understood by examining a broad base of factors.

If time limitations dictate that only a few factors can be assessed, this study suggests that BDI scores taken early in the puerperium may best be predicted first by low Mother Efficacy scores; second, by high pregnancy depression scores; and third, by high birth stress scores.

This study indicates that assessment should take place in the early puerperium, as well as during pregnancy, as BDI scores taken in the early puerperium were the best predictors of BDI scores taken at six weeks postpartum. The second best predictor of BDI III scores was high life stress.

Such as assessment procedure is limited by its inability to specify to what degree a woman is at risk for postpartum depression. To accurately assess risk, a woman's vulnerability, as well as her exposure, to stress needs quantification. Secondly, the interaction between these two variables needs to be understood. Pye and McGhie (1981) have proposed a stress-vulnerability model that if verified, could provide more precision in the process of prediction. The authors suggest that:

> women with low vulnerability and low stress would be expected to experience no significant depression through the course of the study. Women with low vulnerability and high stress would be expected to show late onset depression, in the postpartum only. Highly vulnerable subjects should show depression onset during pregnancy. Where no new stresses occur to a highly vulnerable subject, the depression is expected to remit in the early postpartum. Highly vulnerable subjects who experience extra stress during pregnancy, or in relation to the birth are expected to remain depressed during the postpartum or may show an exacerbation of the depression (Pye and McGhie, 1981, p. 120).

Aetiology

Looking at the predictive factors in generalized terms it becomes apparent that depression and stress are common denominators in both sets of postnatal BDI scores. A common aetiology is further implied by the result that the pregnancy BDI scores were significantly related to the BDI II scores, and in turn, the BDI II scores were

significantly related to the BDI III scores. Perhaps it would be more accurate to see postapartum depression as an ongoing process, that begins before rather than after delivery.

Incidental Variables

Of all the incidental variables analysed, social economic status was the only one that showed a significant relationship to pregnancy depression (refer to Table 13). These results are inconsistent with other comparative studies (Pye and McGhie, 1981; Olioff and Aboud, 1984).

One possible reason for the varying results would be if the social economic status recorded was that of the woman's, rather than that of her partner's. The Blishen Scale Score was used to measure socioeconomic status (SES) in this study, and requires that the highest SES of a couple be recorded. If it is the woman who has the highest SES, then pregnancy might be regarded as a greater disruption and stress to the progress of her career. The only means to verify this hypothesis would be to identify if the SES recorded was a reflection of the woman's career status, or that of her partner's.

Limitations of the Study

The results of the study must be considered within the context of the sample that was studied - that is, a mixed primiparous/multiparous group, of middle class normal women, who were co-habiting with the father of their child. To alter any of these factors may change the extent to which the results can be generalized. As an example, it was hypothesized in the study that if the sample had been comprised of only primiparous women, the results might have varied.

Future Research

The discrepancies in results between this, and more recent, research may be due to the difference in sample. As mentioned previously, the results of this study were based on a combined primiparous and multiparous group - whereas other studies tended to focus just on the primiparous group (Olioff and Aboud, 1984; Pye and McGhie, 1981). The hypothsis generated to explain why these two groups might differ in depressive symptomology can only be verified by experimental examination of this issue. At present there is a dirth of studies comparing primiparous and multiparous groups within a prospective design on a wide variety of factors. It needs to be determined if the postpartum depression scores associated with each group differs in precursors and prognosis.

Theoretical Implications

The fact that the postpartum depression scores appear to be associated with a wide variety of factors lends partial support to Paykel's model of depression (1979). The basic premise of an interaction effect between vulnerability factors and stress factors seems reasonable. In this study both vulnerability factors (such as self-efficacy), and stress factors (such as pregnancy, birth, and life stressors) all played a role in the onset of depression. However, Paykel's model cannot account for how these factors interact to cause depression. A more sophisticated model needs to be developed that can predict a woman's vulnerability to psychological difficulties after delivery. Such a model needs to define how several broad based factors (such as stress, psychological vulnerability, and genetic predisposition) interact to produce a spectrum of psychological disturbance.

Conclusion

Perhaps the most important overall finding in this study is the verification that postpartum depression is indeed associated with a variety of factors. Although it still remains to be understood how these factors combine to create depression, just the recognition that there are contributing variables functions to demystify postpartum depression. It need no longer be viewed as a random occurrence, but instead as a disorder where both intervention and control are plausible and possible.

REFERENCES

Beck, A.T. Depression: Clinical, Experimental, and Theoretical Aspects. New York: Hoeber, 1967.

Beck, A.T., Ward, C.H., Mendelson, M., Mock, J., and Erbaugh, J. An inventory for measuring depression. Archives of General Psychiatry, 1972, 26, 123 - 129.

Beck, A.T. Cognitive Therapy and the Emotional Disorders. New York: International Universities Press, 1976.

Berkman, L.F. Social networks, host resistance, and mortality: A follow-up study of Alameda County residents. Doctoral dissertation. University of California, Berkeley, 1977.

Berkman, L.F., and Syme, S.L. Social network, host resistance, and mortality: A nine-year follow-up study of Alameda County residents. American Journal of Epidemiology, 1979, 109, 186-204.

Blishen, B.R., and McRoberts, H.A. A revised socio-economic index for occupations in Canada. Canadian Review of Sociology and Antropology, 1976, 13, 71 - 79.

Blumberg, N.J. Effects of neonatal risk, maternal attitude, and cognitive style on early postpartum adjustment. Journal of Abnormal Psychology, 1980, 89, 139-150.

Brockington, I.F., Schofield, E.M., Donnelly, P., and Hyde, C.A. Clinical study of postpartum psychosis. In. Sandler, M., (Ed.), Mental Illness In Pregnancy and the Puerperium. Oxford: Oxford University Press, 1978.

Brockington, I.F., and Kumar, R.,(Eds.), Motherhood and Mental Illness. London: Academic Press Inc.Ltd., 1982.

Brown, G.W., and Harris, T. Social Origins of Depression. London: Tavistock Publications, 1978.

Dalton, K. Prospective study in puerperal depression. British Journal of Psychiatry, 1971, 118, 689-92.

Dean, C., and Kendell, R.E. The symptomatoloty of puerperal illness, British Journal of Psychiatry, 1981, 139, 128-133.

Deutch, H. The psychology of women. New York: Grune and Stratton, 1947.

Devins, G.M., Binik, Y.M., Hollomby, D.J., Barre, T.E., and Guttman, R.D. Helplessness and depression in end-style renal disease. Journal of Abnormal Psychology, 1981, 90, 531 - 545.

Dobson, K.S., and Breiter, H.J. Cognitive assessment of depression: reliability and validity of three measures. Journal of Abnormal Psychology, 1983, 92, (1), 107-109.

Draper, N.R., and Smith, H. Applied Regression Analysis (2nd ed.). New York: John Wiley and Sons, 1981.

Elliot, S.A., Rugg, A.J., and Watson, J.P. Mood changes during pregnancy and after the birth of a child. British Journal of Clinical Psychology, 1983, 22, 295-308.

Gelder, M. Harmones and postpartum depression. In: M. Sandler (Eds.), Mental Illness in Pregnancy and the Puerperium, Oxford, England: Oxford Unversity Press, 1978.

Gibaud-Wallston, J., and Wandersman, L.P. Development and utility of the parenting sense of competence scale. Paper presented at the meeting of the American Psychological Association, Toronto, Canada, August 1978.

Gordon, R.E. and Gordon K.K. Social factors in prevention of postpartum emotional problems. Obstetrics and Gynecology, 1960, 15, 433 - 437.

Grossman, F.K., Eichler, L.S. Ninechoff, S.A. Pregnancy, Birth and Parenthood, San Fransisco: Jasey. Bass Publishers, 1980.

Hamilton, J.A. The Identity of Postpartum Psychosis. In: I.F. Brockington and R. Kumar (Eds.), Motherhood and Mental Illness, London:Academic Press, Inc. Ltd.,1982.

Handley, S.L., Dunn, T.L., Waldron, G., and Baker, J.M. Tryptophan, cortisol and puerperal mood. British Journal of Psychiatry, 1980, 498 - 508.

Hollon, S.D., and Kendall, P.C. Cognitive self-statements in depression : development of an automatic thoughts quesionnaire. Cognitive Therapy and Research, 1980, 4, 383 - 395.

Kendell, R.E., and McGUire, R.J., Connor, Y. and Cox, J.L. Mood changes in the first three weeks after childbirth. Journal of Affective Disorders, 1981, 3, (4), 317 - 326.

Manly, P.C., McMahon, R.J., Bradley, C.F., and Davidson, P.O. Depressive attributional style and depression following childbirth. Journal of Abnormal Psychologists, 1982, 91, (4), 245 - 254.

Meltzer, E.S., and Kumar, R. Puerperal mental illness, clinical features and classification: A study of 142 Mother-and-Baby admissions. British Journal of Psychiatry, 1985, 147, 647-654.

Miller, W.R., Seligman, Martic, E. Depression and the perseption of reinforcement. Journal of Abnormal Psychology, 1973, 82, (1), 62 - 73.

Nott, P.N., Franklin, M., Armitage, C., and Gelder, M.G. Hormonal changes and mood in the puerperium. British Journal of Psychiatry, 1976, 128, 379 - 383.

Nuckolls, K.B., Cassel, J., and Kaplan, B.H. Psychological assets, life crisis and the prognosis of pregnancy. American Journal of Epidemiology, 1972, 95, (5), 431 - 441.

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

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

Olioff, M., and Aboud. Cognitive predictors of postpartum depressive symptons. Annual Meeting of the Canadian Psychological Association in Ottawa, 1984, unpublished doctoral thesis.

Olioff, M., Bryson, S.E., and Wadden, N. Predicting depressive symptons : Role of automatic thoughts and student efficacy. Paper presented at the annual meeting of the Canadian Psychological Association, Halifax, 1985.

Oppenheim, G. Pyschological aspects of pregnancy and childbirth. British Journal of Psychiatry, 1973, 122, 431 - 434.

Paykel, E.S., Myers, J.K., Dienelt, M.N., Klerman, G.L., Lindenthal, J.J., Pepper, M.P., Life events and depression. Archives of General Psychiatry, 1969, 21, 753 - 760.

Paykel, E.S., Emms, E.M., Fletcher, J., and Rassaby, E.S. Life events and social support in puerperal depression. British Journal of Psychiatry, 1980, 136, 339 - 346.

Pitt, B. Atypical depression following childbirth. British Journal of Psychiatry, 1968, 114, 1325 - 1327.

Pitt, B. Maternity Blues. British Journal of Psychiatry, 1973, 122, 431 - 433.

Pitt, B. Depression and childbirth. (In E.S. Paykel (Ed.) The Handbook of Affective Disorders. New York: The Guildford Press, 1982).

Protheroe, C. Puerperal Psychosis: a long term study. 1927-1961. British Journal of Psychiatry, 1969, 115, 9 - 30.

Pye, C.J. and McGhie, A. Postpartum depression in a normal population : A prospective multivariate. Unpublished manuscript, 1981.

Rees, W.D. and Lutkins, S.G. Parental depresiion before and after childbirth. Journal of the Royal College of General Practioners, 1971, 21, 26 - 31.

Robin, A.M. Psychological changes of normal parturation. Psychiatric Quarterly, 1962, 36, 129 - 150.

Saks, B.R., Frank, J.B., Lowe, T.L., Berman, W., Naftolin, F., Cohen, D.J. Depressed mood during pregnancy and the puerperium : clinical recognition and implication for clinical practice. The American Journal of Psychiatry, 1985, 142, (6), 728 - 731.

Sarason, I.G., Johnson, J.H., and Siegal, J.M. Assessing the impact of life changes : Development of the Life Experiences Survey. Journal of Consulting and Clinical Psychology, 1978 (Oct), 46, (5), 932 - 946.

Selby, J., Calhoun, L.G., Vogel, A.V., and King, H.E. Psychology and Human Reproduction. New York : The Free Press, 1980.

Stein, G., and Kruckman, L. Multidisciplinary perspectives on postpartum depression : An antropolgical critique. Social Science Medicine, 1981, 17, (15), 1027 - 1041.

Stein, G. The Maternity Blues : In Brockington, I.F., Kumar, R. (Eds), Motherhood and Mental Illness. LOndon : Academic Press, 1982.

Watson, J.P. Elliott, S.A., Rugg, A.J., Brough, D.I. Psychiatric disorder in pregnancy and the first postnatal year. British Journal of Psychiatry. 1984, 144, 433 - 462.

Weiss, S. and Ebert, M. Psychological and behavioral characteristics of normal weight bulimics and normal weight controls. Psychosomatic Medicine, 1983, 45, 293 - 303.

Yalom, I.K., Lunde, D.T., Rudolf, H.M. and Hamburg, D.A. " Postpartum Blues "syndrome. Archives of General Psychiatry, 1968, 18, 16 - 27.

Zaicek, E., and Wolkind, S. Emotional difficulties in married women during and after the first pregnancy. British Journal of Medical Psychology, 1978 (Dec), 51, (4), 379 - 385.

Appendix A-1

Biographical Data For Subjects

SUBJECT NO.	AGE	SES	MONTH AND YEAR OF DELIVERY
1	32	34.31	Sept 17, 1984
2	29	71.77	Oct 5, 1984
3	25	40.96	March 3, 1985
4	33	74.22	Feb 23, 1985
5	36	73.22	Sept 8, 1984
6	28	68.67	Sept 13, 1984
7	29	69.25	Nov 29, 1984
8	21	32.28	Oct 7, 1984
9	19	19.24	Oct 1, 1984
10	25	44.89	Nov [illegible] 1984
11	32	71.95	Sept 2[illegible] 984
12	26	52.44	Jan 3. [illegible]985
13	30	55.03	Oct 31, 1984
14	32	44.40	Feb 24, 1985
15	24	74,43	Oct 25, 1984
16	30	60.99	Oct 20, 1984
17	29	46.88	Oct 7, 1984
18	27	40.74	Oct 14, 1984
19	33	66.88	Feb 8, 1985
20	26	48.28	Feb 7, 1985
21	33	52.23	Dec 30, 1984
22	26	39.02	Dec 14, 1984
23	30	74.22	Nov 2, 1984
24	32	69.25	Jan 17, 1985
25	26	74.22	Feb 17, 1985
26	36	75.28	Jan 20, 1985
27	28	67.18	Jan 28, 1985
28	38	60.99	April 30, 1985
29	34	69.25	Jan 3, 1985
30	26	70.74	Feb 15, 1985
31	26	43.31	Feb 2, 1985
32	25	61.19	Feb 22, 1985
33	27	68.67	March 3, 1985
34	32	48.51	Nov 27, 1984
35	20	38.35	Feb 22, 1985
36	32	72.29	March 5, 1985
37	29	71.77	April 16, 1985

DEPRESSION INVENTORY
(Beck, 1961)

Name: _____ Date: _____

This is a questionnaire. On the questionnaire are groups of statements. Read all statements in each group carefully. Then place an X besides the one statement in each group that best describes the way you feel right now.

A. (SADNESS)

I do not feel sad
I feel blue or sad
I am blue or sad all the time and I can't snap out of it
I am so sad or unhappy that it is quite painful
I am so sad or unhappy that I can't stand it

B. (PESSIMISM)

I am not particularly pessimistic or discouraged about the future
I feel discouraged about the future
I feel I have nothing to look forward to
I feel that I won't ever get over my troubles
I feel that the future is hopeless and that things cannot improve

C. (SENSE OF FAILURE)

I do not feel like a failure
I feel I have failed more than the average person
I feel I have accomplished very little that is worthwhile or that means anything
As I look back on my life all I can see is a lot of failures
I feel I am a complete failure as a person (parent, husband, wife)

D. (DISSATISFACTION)

I am not particularly dissatisfied
I feel bored most of the time
I don't enjoy things the way I used to
I don't get satisfaction out of anything any more
I am dissatisfied with everything

E. (GUILT)
I don't feel particularly guilty
I feel bad or unworthy a good part of the time
I feel quite guilty
I feel bad or unworthy practically all the time now
I feel as though I am very bad or worthless

F. (EXPECTATION OF PUNISHMENT)
I don't feel I am being punished
I have a feeling that something bad may happen to me
I feel I am being punished or will be punished
I feel I deserve to be punished
I want to be punished

G. (SELF-DISLIKE)
I don't feel disappointed in myself
I am disappointed in myself
I don't like myself
I am disgusted with myself
I hate myself

H. (SELF-ACCUSATIONS)
I don't feel I am any worse than anybody else
I am critical of myself for my weaknesses or mistakes
I blame myself for my faults
I blame myself for everything bad that happens

I. (SUICIDAL IDEAS)
I don't have any thoughts of harming myself
I have thoughts of harming myself but I would not carry them out
I feel I would be better off dead
I feel my family would be better off if I were dead
I have definite plans about committing suicide
I would kill myself if I could

J. (CRYING)
I don't cry any more than usual
I cry more now than I used to
I cry all the time now. I can't stop it
I used to be able to cry but now I can't cry at all even though I want to

K. (IRRITABILITY)
I am no more irritated now than I ever am
I get annoyed or irritated more easily than I used to
I feel irritated all the time
I don't get irritated at all at the things that used to irritate me

L. (SOCIAL WITHDRAWAL)
I have not lost interest in other people
I am less interested in other people now than I used to be
I have lost most of my interest in other people and have little feeling for them
I have lost all my interest in other people and don't care about them at all

M. (INDECISIVENESS)
I make decisions about as well as ever
I try to put off making decisions
I have great difficulty in making decisions
I can't make any decisions at all any more

N. (BODY IMAGE CHANGE)
I don't feel I look any worse than I used to
I am worried that I am looking old or unattractive
I feel that there are permanent changes in my appearance and they make me look unattractive
I feel that I am ugly or repulsive looking

O. (WORK RETARDATION)
I can work about as well as before
It takes extra effort to get started at doing something
I don't work as well as I used to
I have to push myself very hard to do anything
I can't do any work at all

P. (INSOMNIA)
I can sleep as well as usual
I wake up more tired in the morning than I used to
I wake up 1 - 2 hours earlier than usual and find it hard to get back to sleep
I wake up early every day and can't get more than 5 hours sleep

Q. (FATIGABILITY)
I don't get any more tired than usual
I get tired more easily than I used to
I get tired from doing anything
I get too tired to do anything

R. (ANOREXIA)
My appetite is no worse than usual
My appetite is not as good as it used to be
My appetite is much worse now
I have no appetite at all any more

S. (WEIGHT LOSS)
I haven't lost much weight, if any, lately
I have lost more than 5 pounds
I have lost more than 10 pounds
I have lost more than 15 pounds

Partner's Overall Depression Rating
The P.O.D.R. - Olioff and Aboud, 1984.

How often (what percentage of the time did your partner or girlfriend seem to be sad or depressed this week?

_____%

How strong or intense were those feelings of sadness or depression?

not intense 1 2 3 4 5 6 7 8 9 very intense

How confident would you say your partner feels about becoming a mother?

Not confident 1 2 3 4 5 6 7 8 9 very confident

How confident would you say your partner is in general?

Not confident 1 2 3 4 5 6 7 8 9 very confident

For copy's of the Partner's overall Depression Rating write to:

Dr. Mark Olioff
The Mississauga Hospital
100 Queensway West
Mississauga, Ontario
L5B 1B8

Pregnancy Questionnaire - Dr. Carol Pye, 1981
Atlantic Child Guidance Centre, Hfx.

Listed below are a number of events which can occur to women during pregnancy. Please check any events which happened to you during the times shown below.

Also for each event show the amount of distress the event caused you by using the number 0 to 4 as follows:

0 No Distress | 1 Mild Distress | 2 Moderate Distress | 3 High Level Distress | 4 Very Extreme Distress

Events	1st 3 Months of Pregnancy		4-6 months		7-9 months	
	Did this happen?	How Distressing was it?	Did this Happen?	How Distressing was it?	Did this happen	How Distressing was it?
1. You got pregnant accidentally.						
2. You did not want the pregnancy.						
3. The baby's father did not want the pregnancy.						
4. Other family members were upset about your prenancy.						
5. You got pregnant when you were not living with the baby's father or Not getting along well together.						

0 No Distress | 1 Mild Distress | 2 Moderate Distress | 3 High Level Distress | 4 Very Extreme Distress

Events	1st 3 Months of Pregnancy		3-6 Months of Pregnancy		6-9 Months of Pregnancy	
	Did this happen?	How Distressing was it?	Did this happen?	How Distressing was it?	Did this happen?	How Distressing was it?
You were afraid something might be wrong with your baby. e.g.: - mental retardation - something runs in the family - you are over 35						
Your pregnancy created problems with your job or school: could not do work missed time had to quit						
The pregnancy is causing money worries now later						
Did you have problems with a past pregnancy? - caesarian - stillbirth or death of baby - a long labor - difficult delivery						

0	1	2	3	4
No Distress	Mild Distress	Moderate Distress	High Level Distress	Very Extreme Distress

Events	1st 3 Months of Pregnancy		3-6 Months of Pregnancy		6-9 Months of Pregnancy	
	Did this happen?	How Distressing was it?	Did this happen?	How Distressing was it?	Did this happen?	How Distressing was it?
Some problem was descovered with the pregnancy or baby: - high blood pressure - diabetes - Rh. Negative blood - expecting twins - breech position of baby - other						
Other, please explain						

A sample of Moos Menstrual Distress Questionnaire is not provided because the test is protected by copyright laws. Copy's of the test, in addition to further psychometric information can be obtained by writing to:

Rudolf H. Moos
Social Ecology Laboratory
Dept. of Psychiatry and Behavioral Science
Stanford University School Of Medicine
and Veterans Administration Medical Centers
Palo Alto, California 94304

Birth Questionnaire 1

Listed below are a number of events which can occur to women at the time of a baby's birth. Please check any events which happened to you during the times shown below. Also for each event show the amount of distress the event caused you by using the number 0 to 4 as follows:

1	2	3	4
Mild Distress	Moderate Distress	High Level Distress	Very Extreme Distress

Events	Did this happen?	How Distressing Was It?
1. Baby born before due date - 2-4 weeks early - 5-6 weeks early - 7 or more weeks early		
2. Caesarian section planned unplanned		
3. Labor was started by medication.		
4. Labor was long difficult or painful 12-24 hours 24-48 hours more than 48 hours		
5. Multiple birth twins triplets		
6. Defect in the baby Not requiring surgery Requiring surgery		
7. Baby was underweight at birth Less than 3 lbs. Less than 3-4 lbs. Less than 4-5 lbs.		

0 No Distress	1 Mild Distress	2 Moderate Distress	3 High Level Distress	4 Very Extreme Distress

Event	Did this happen?	How Distressing was it
8. Baby had a defect and/or medical problem.		
9. Feeding problem baby not feeding well mother has sore nipples pain, breast discomfort other problem(explain)		
10. While in the hospital you experienced conflict with: baby's father family member hospital staff.		
11. Other stress please explain		

Automatic Thoughts Questionnaire
Hollon and Kendall. 1980

Listed below are a variety of thoughts that pop into people's heads. Please read each thought and indicate how frequently, if at all the thought occurred to you over the last week. Please read each item carefully and circle the appropriate number in the following fashion: (1 = 'not at all', 2 = 'sometimes,' 3 = 'moderately often,' 4 = 'often,' and 5 = 'all the time').

		Not at all				All the time
1.	I feel like I'm up against the world.	1	2	3	4	5
2.	I'm no good.	1	2	3	4	5
3.	Why can't I ever succeed?	1	2	3	4	5
4.	No one understands me.	1	2	3	4	5
5.	I've let people down.	1	2	3	4	5
6.	I don't think can go on.	1	2	3	4	5
7.	I wish I were a better person.	1	2	3	4	5
8.	I'm so weak.	1	2	3	4	5
9.	My life's not going the way I want it to.	1	2	3	4	5
10.	I'm so disappointed in myself.	1	2	3	4	5
11.	Nothing feels good anymore.	1	2	3	4	5
12.	I can't stand this anymore.	1	2	3	4	5
13.	I can't get started.	1	2	3	4	5
14.	What's wrong with me?	1	2	3	4	5
15.	I wish I were somewhere else.	1	2	3	4	5
16.	I can't get things together	1	2	3	4	5
17.	I hate myself.	1	2	3	4	5
18.	I'm worthless.	1	2	3	4	5
19.	Wish I could just disappear.	1	2	3	4	5
20.	What's the matter with me?	1	2	3	4	5
21.	I'm a loser.	1	2	3	4	5
22.	My life is a mess.	1	2	3	4	5
23.	I'm a failure.	1	2	3	4	5

The Mother Efficacy Questionnaire - Oliff and Aboud, 1984

The Mississauga Hospital
100 Queensway West
Mississauga, Ontario
15B 1B8

Listing Activites

Directions - List ten activities that you think good mothers do with their infants (for example, bathing the baby regularly). Be speacific.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

i. _____

j. _____

Now go back over your list and rank order your activities according to how important you think each is. Put a number 1 beside the activity you think is most important, a number 2 beside the second most important, etc., so that the number 10 is beside the activity you think is least important.

Your list of Mothers' activities is written below.

Decide what you think is a satisfactory level of performance for each activity. Then under the column EXPECTATION, check those activities that you expect you will be able to do satisfactorily whenever you have to do them during the six months after you give birth.

Finally, for the activities that you check under EXPECTATION, indicate in the column CONFIDENCE how confident you are that you will be able to dom the activities satisfactorily when required during the specified period. Rate your degree of confidence by recording a number from 10 to 100, using the given below.

10	20	30	40	50	60	70	80	90	100
quite uncertain				moderately certain					certain

		Expectation	Confidence
a.	_____	____	____
b.	_____	____	____
c.	_____	____	____
d.	_____	____	____
e.	_____	____	____
f.	_____	____	____
g.	_____	____	____
h.	_____	____	____
i.	_____	____	____
j.	_____	____	____

The M.E.

For which of the following reasons might you have trouble with the activities:

a. You have a difficult baby.

b. You lack the ability to carry out the activities successfully.

c. You lack experience or practice with babies.

d. You lack sufficient help from others.

e. Please describe any other reason in the space below.

The Life Experiences Survey - Sarason, Johnson and Siegel, 1978

Listed below are a number of events which sometimes bring about change in the lives of those who experience them and which necessitate social readjustment. Please check those events which you have experienced in the past year. Be sure that all check marks are directly across from the items they correspond to.

Also, for each item checked below, please indicate the extent to which you viewed the event as having either a positive or negative impact on your life at the time the event occurred. That is, indicate the type and extent of impact that the event had. A rating of -3 would indicate an extremely negative impact. A rating of 0 suggests no impact either positive or negative. A rating of +3 would indicate an extremely positive impact.

Section 1

	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
1. Marriage	-3	-2	-1	0	+1	+2	+3
2. Death of spouse	-3	-2	-1	0	+1	+2	+3
3. Major change in sleeping habits (much more or much less sleep)	-3	-2	-1	0	+1	+2	+3
4. Death of close family member:							
a. mother	-3	-2	-1	0	+1	+2	+3
b. father	-3	-2	-1	0	+1	+2	+3
c. brother	-3	-2	-1	0	+1	+2	+3
d. sister	-3	-2	-1	0	+1	+2	+3
e. grandmother	-3	-2	-1	0	+1	+2	+3
f. grandfather	-3	-2	-1	0	+1	+2	+3
g. other (specify)	-3	-2	-1	0	+1	+2	+3
5. Major change in eating habits (much more or much less food intake)	-3	-2	-1	0	+1	+2	+3

	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
6. Foreclosure on mortgage or loan	-3	-2	-1	0	+1	+2	+3
7. Death of close friend	-3	-2	-1	0	+1	+2	+3
8. Outstanding personal achievement	-3	-2	-1	0	+1	+2	+3
9. Minor law violations (traffic tickets, disturning the peace etc.)	-3	-2	-1	0	+1	+2	+3
10. Pregnancy	-3	-2	-1	0	+1	+2	+3
11. Changed work situation (different work responsibility, major change in working conditions, working hours etc.)	-3	-2	-1	0	+1	+2	+3
12. New job	-3	-2	-1	0	+1	+2	+3
13. Serious illness or injury of close family member:							
a. father	-3	-2	-1	0	+1	+2	+3
b. mother	-3	-2	-1	0	+1	+2	+3
c. sister	-3	-2	-1	0	+1	+2	+3
d. brother	-3	-2	-1	0	+1	+2	+3
e. grandfather	-3	-2	-1	0	+1	+2	+3
f. grandmother	-3	-2	-1	0	+1	+2	+3
g. partner	-3	-2	-1	0	+1	+2	+3
h. other (specify)	-3	-2	-1	0	+1	+2	+3
14. Sexual difficulties	-3	-2	-1	0	+1	+2	+3
15. Tro uble with employer (in danger of losing job, being suspended, demoted etc.)	-3	-2	-1	0	+1	+2	+3
16. Trouble with in-laws	-3	-2	-1	0	+1	+2	+3

	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
17. Major change in financial status (a lot better off or a lot worse off)	-3	-2	-1	0	+1	+2	+3
18. Gaining a new family member (through birth, adoption, family member moving in, etc.)	-3	-2	-1	0	+1	+2	+3
19. Change of residence	-3	-2	-1	0	+1	+2	+3
20. Separation from partner	-3	-2	-1	0	+1	+2	+3
21. Major change in church activities (increased or decreased attendance)	-3	-2	-1	0	+1	+2	+3
22. Reconciliation with mate	-3	-2	-1	0	+1	+2	+3
23. Major change in number of arguments with partner (a lot more or a lot less arguments)	-3	-2	-1	0	+1	+2	+3
24. Change in partner's work (loss of job, beginning new job, retirement, etc.)	-3	-2	-1	0	+1	+2	+3
25. Major change in usual type and/or amount of recreation	-3	-2	-1	0	+1	+2	+3
26. Borrowing more than $10000 (buying home, business etc)	-3	-2	-1	0	+1	+2	+3
27. Borrowing less than $10000 (buying car, TV, getting school loan, etc.)	-3	-2	-1	0	+1	+2	+3
28. Having abortion	-3	-2	-1	0	+1	+2	+3
29. Major personal illness or injury	-3	-2	-1	0	+1	+2	+3

	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
30. Major change in social activities, e.g. parties movies, visiting (increased or decreased participation)	-3	-2	-1	0	+1	+2	+3
31. Major change in living conditions of family (building new home, remodelling, deterioration of home, neighborhood, etc.)	-3	-2	-1	0	+1	+2	+3
32. Divorce	-3	-2	-1	0	+1	+2	+3
33. Serious injury or illness of close friend	-3	-2	-1	0	+1	+2	+3
34. Retirement from work	-3	-2	-1	0	+1	+2	+3
35. Son or daughter leaving home (due to marriage, college, etc.)	-3	-2	-1	0	+1	+2	+3
36. Ending of formal schooling	-3	-2	-1	0	+1	+2	+3
37. Separation from partner (due to work, travel, etc.)	-3	-2	-1	0	+1	+2	+3
38. Breaking up with partner	-3	-2	-1	0	+1	+2	+3
39. Leaving home for first time	-3	-2	-1	0	+1	+2	+3
40. Reconciliation with partner	-3	-2	-1	0	+1	+2	+3
Other recent experiences which have had an impact on your life. List and rate.							
41. _____	-3	-2	-1	0	+1	+2	+3
42. _____	-3	-2	-1	0	+1	+2	+3
43. _____	-3	-2	-1	0	+1	+2	+3

Section 2: Student only

	extremely negative	moderately negative	somewhat negative	no impact	slightly positive	moderately positive	extremely positive
1. Beginning a new school experience at a higher academic level (college, graduate school, professional school, etc.)	-3	-2	-1	0	+1	+2	+3
2. Changing to a new school at same academic level (undergraduate, graduate etc.)	-3	-2	-1	0	+1	+2	+3
3. Academic probation	-3	-2	-1	0	+1	+2	+3
4. Being dismissed from dormitory other residence	-3	-2	-1	0	+1	+2	+3
5. Failing an important exam	-3	-2	-1	0	+1	+2	+3
6. Changing a major	-3	-2	-1	0	+1	+2	+3
7. Failing a course	-3	-2	-1	0	+1	+2	+3
8. Dropping a course	-3	-2	-1	0	+1	+2	+3
9. Joining a fraternity/sorority	-3	-2	-1	0	+1	+2	+3
10. Financial problems concerning school (indanger of not having sufficient money to continue)	-3	-2	-1	0	+1	+2	+3

PARENTING SENSE OF COMPETENCE SCALE - Gibaud-Wallston and Wandersman, 1978

Listed below are a number of statements. Please respond to each item, indicating your agreement or disagreement with each statement in the following manner:

If you strongly agree, circle SA
If you agree, circle A
If you mildly agree, circle MA
If you mildly disagree, circle MD
If you disagree, circle D
If you strongly disagree, circle SD

The problems of taking care of a baby are easy to solve once you know how your actions affect your baby, an understanding I have acquired.	SD D MD MA A SA
Even though being a parent could be rewarding, I am frustrated now, while my child is only an infant.	SD D MD MA A SA
I go to bed the same way I wake up in the morning, feeling I have not accomplished a whole lot.	SD D MD MA A SA
I do not know why it is, but sometimes when I'm supposed to be in control, I feel more like the one being manipulated.	SD D MD MA A SA
My mother was better prepared to be a good mother than I am.	SD D MD MA A SA
I would make a fine model for a new mother to follow in order to learn what she would need to know to be a good parent.	SD D MD MA A SA
Being a parent is manageable and any problems are easily solved.	SD D MD MA A SA
A difficult problem in being a parent is not knowing whether you're doing a good job or a bad one.	SD D MD MA A SA
Sometimes I feel like I'm not getting anything done.	SD D MD MA A SA

PARENTING SENSE OF COMPETENCE SCALE

I meet my own personal expectations for expertise in caring for my baby.	SD D MD MA A SA
If anyone can find the answer to what is troubling my baby, I am the one.	SD D MD MA A SA
My talents and interests are in other areas, not in being a parent.	SD D MD MA A SA
Considering how long I've been a mother, I feel thoroughly familiar with this role.	SD D MD MA A SA
If being a mother of an infant were only more interesting, I would be motivated to do a better job as a parent.	SD D MD MA A SA
I honestly believe I have all the skills necessary to be a good mother.	SD D MD MA A SA
Being a parent makes me tense and anxious.	SD D MD MA A SA
Being a good mother is a reward in itself.	SD D MD MA A SA

Raw Data Scores (Multi Group)

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. BDI #1	0	7	4	3	5	5	1	8	4	2	4	3	6	6	6	6	7	2	6
2. BDI #2	0	2	0	1	1	3	3	3	0	0	3	1	6	5	2	4	2	1	4
3. BDI #3	0	1	1	0	6	1	2	7	4	0	3	1	2	2	3	3	2	1	5
4. Life Experiences	3	3	7	4	12	0	0	7	6	6	4	3	7	21	9	2	7	2	16
5. Pregnancy Stress	2	11	4	9	6	0	1	3	5	2	7	0	4	6	8	14	8	0	15
6. Moos Menstrual Distress	29	42	34	19	20	35	18	40	37	19	19	18	47	47	23	40	31	22	30
7. Automatic Thoughts	31	30	34	43	41	33	30	37	36	34	33	37	35	56	32	59	38	34	41
8. Mother Efficacy 1	98	94	87	91	93	92	100	90	100	94	98	100	91	87	100	91	100	97	90
9. Mother Efficacy 2	100	92	84	97	91	88	100	88	100	93	98	100	94	93	100	95	98	92	100
10. Berkman's Social Support	3	3	3	3	3	2	3	3	3	2	4	2	3	2	2	3	3	1	2
11. Birth Stress	5	4	1	4	3	0	0	4	3	1	4	0	4	1	18	0	2	0	6
12. Parent Competence	94	74	78	92	84	77	85	73	79	99	76	72	79	76	88	64	87	82	68

Raw Data Scores (Primi Group)

Subject	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. BDI #1	1	2	1	2	14	3	13	2	8	10	1	6	0	6	4	3	13	1
2. BDI #2	0	6	1	1	13	1	30	3	1	1	5	6	6	2	1	6	6	3
3. BDI #3	0	3	0	1	6	0	23	1	0	3	8	22	2	3	1	2	9	1
4. Life Experiences	3	6	2	0	1	0	19	0	3	13	3	4	0	10	0	9	13	4
5. Pregnancy Stress	2	3	1	0	10	4	15	6	6	12	7	7	0	6	0	16	11	5
6. Moos Menstrual Distress	24	60	22	34	30	46	58	41	32	18	39	40	44	33	37	42	31	28
7. Automatic Thoughts	37	32	30	30	57	33	66	33	33	43	42	36	45	42	32	33	62	33
8. Mother Efficacy 1	91	89	100	88	63	94	60	66	98	100	89	86	75	94	90	96	92	89
9. Mother Efficacy 2	92	93	99	95	88	79	44	92	89	90	94	86	73	90	98	98	85	97
10.Berkman's Social Support	4	3	3	3	2	3	2	3	3	2	3	3	3	3	3	3	1	3
11.Birth Stress	10	12	4	2	4	6	12	5	3	6	15	12	8	3	0	14	14	5
12.Parent Competence	75	82	74	78	75	90	40	71	74	97	64	65	62	61	86	75	75	86

Appendix D-1

Information and Consent Form

I am a graduate student in clinical psychology at St. Mary's University. For my thesis I am studying the psychological changes that occur during pregnancy, and the early post-partum period. To complete my research I require 40 women to answer questionnaires when they are between 7-9 months pregnant (Phase I); on day 5,6, or 7 post-partum (Phase II); and, six weeks post-partum (Phase III).

I will be present during the completion of Phase I (which will take approximately 41 to 76 minuutes to finish), so that I will be able to answer any questions you may have. Phases II and III (which take between 15 - 35 minutes to finish), can be completed at home at your own convenience. If you should have any questions I will be available to answer them over the telephone.

The questionnaires are confidential, so that the information you provide will only be known to myself. The information required mainly concerns questions about you and your baby.

If you decide to participate overall results of the study will be provided at its completion. If your initial decision to participate should change in the course of the study, you are under no obligation to continue.

If you should decide not to participate your decision will in no way effect the care you receive at the Grace Maternity Hospital.

Thank-you for your co-operation. Susan Chandler

I, NAME agree to participate in the study on the psychological changes in pregnancy.

Appendix D-2

Pregnancy Study

Subject Questionnaire

CONFIDENTIAL

Name: _____

Age: _____

Address: _____

Home Telephone: _____

Occupation : _____
(If temporarily unemployed, give usual occupation).

Name of Husband or Partner: _____

Occupation of husband or partner: _____
(If temporarily unemployed, give usual occupation).

Have you ever received help for an emotional or psychological problem from:

- A psychiatrist YES NO
- A psychologist YES NO
- A counsellor YES NO
- A social worker YES NO
- A medical doctor YES NO

Other Counselling or Hental Health Service not covered above (Specify in space below).

_____

_____

If you answered YES to any of the above, what was the type of problem, your age at the time, and the type of help received? This information would be helpful for this research, but you are free not to answer if you prefer).

_____

_____

_____

Thank you for your cooperation. Susan Chandler.