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THE BUFFERING EFFECTS OF SOCIAL SUPPORT ON PSYCHOLOGICAL

STATES AND OBSTETRICAL OUTCOMES IN PREGNANCY

by

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The Buffering Effects of Social Support on Psychological States and

Obstetrical Outcomes in Pregnancy

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Abstract

The present study examined (1) the relationship between perceived stress, perceived social support, maternal mood states during pregnancy, and pregnancy complications, and (2) the buffering effects of support from spouse, family, and friends on maternal state anxiety and depression during pregnancy, and on pregnancy outcomes. One hundred and three women completed a battery of psychosocial questionnaires assessing perceived stress, perceived social support from spouse, family, and friends, state anxiety, and depression prior to 20 weeks gestation, and then again after 32 weeks gestation. Obstetricians recorded antepartum, intrapartum, and neonatal medical measures. Expected relationships were found between the psychosocial variables. Specifically, higher levels of perceived stress during pregnancy were strongly associated with higher levels of maternal state anxiety and more depressive symptoms. Likewise, higher levels of perceived social support from spouse, family, and friends were consistently associated with lower levels of perceived stress and state anxiety, and fewer behavioural manifestations of depressive symptoms. The relationships between the psychosocial variables and the obstetrical measures were consistently weak. Under high levels of stress, it was found that women with high levels of perceived family support manifested fewer depressive

symptoms than women with low levels of family support. Further, women with high levels of support from spouse and friends gave birth to heavier babies than did women with lower levels of support from these sources. That is, social support from these respective sources buffered the effects of stress on depression and birth weight. When stress conditions were low, however, women with high levels of family support experienced more depressive symptoms than women with low levels of family support, and women with high levels of support from spouse and friends bore lighter babies than their counterparts with lower levels of support from these sources. The results are discussed in terms of (1) the differential effects that various support sources may have on affective states and obstetrical outcomes when stress conditions are perceived to be high, and (2) the possible negative effects of high levels of support when stress conditions are low.

ACKNOWLEDGEMENTS

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Chapter 1

INTRODUCTION

In obstetrics, much attention has focussed on the effects of maternal anxiety, depression, and stress on pregnancy outcome. Typically in these studies, maternal stress, anxiety, or depression, or combinations of these, are assessed once, during the final trimester and then related to the number and type of complications. The pregnancies are categorized as abnormal (i.e., marked by one or more complications) or normal. In general, obstetrical complications are broadly classified into one of three categories: (1) maternal antepartum complications, (2) maternal intrapartum complications, and (3) neonatal complications at birth. Maternal antepartum complications refer to pregnancy-related medical problems experienced by the mother over the course of pregnancy, such as pre-eclampsia or premature labour and delivery. Maternal intrapartum complications pertain to pregnancy-related problems experienced by the mother during labour and delivery, such as prolonged labour. Neonatal complications at birth concern medical difficulties and problems of the newborn infant, such as low birth weight, or abnormalities, among others.

This general research strategy, however, has largely produced discrepant findings. For example, Barnett and

Parker (1986), Crandon (1979a, b), Rizzardo, Magni, and Andreloi et al. (1985) and Rizzardo, Magni, and Cremonese et al. (1988) found that high levels of maternal anxiety during the third trimester were associated with antepartum, intrapartum, and neonatal complications. Conversely, the results gleaned from other studies (e.g., Chalmers, 1983; Molfese, Bricker, & Manion et al., 1987a; Newton & Hunt, 1984; Adler & Hayes, 1990) revealed that state and trait anxiety, and depression, were weakly associated with pregnancy complications, as well as with more quantitative measures of pregnancy outcomes, such as gestational age, 5 minute Apgar scores, and length of stage 1 and stage 2 labour.

In these studies, however, anxiety and depression were assessed once only, usually late in the pregnancy. Other researchers (e.g., Cox & Reading, 1989; Gorsuch & Key, 1974; Lubin, Gardener, & Roth, 1975; O'Hara, 1985; Rizzardo, Magni, & Cremonese et al., 1988; Rofe, Blittner, & Lewin, 1993) have demonstrated that anxiety and depression levels vary as a function of trimester. O'Hara (1985) reported that levels of depressive symptomatology, as assessed by the Beck Depression Inventory, decreased over pregnancy. Gorsuch and Key (1974), Gardner et al. (1975), and Rizzardo et al. (1988) found that state anxiety, but not trait anxiety, peaked in the first and third trimesters, and was significantly lower during the second trimester. Further,

the level of state anxiety in the first trimester only was strongly related to the occurrence of pregnancy complications (Gorsuch & Key, 1974; Rizzardo et al., 1988). In contrast, Cox and Reading (1989) found that state anxiety in the third trimester was significantly higher than in the first and second trimesters. Additionally, state anxiety was a poor predictor of obstetrical outcome measures, such as gestational age, length of labor, or Apgar scores.

Several conclusions can be drawn from the results of these studies. It is important to examine anxiety and depression over the course of pregnancy owing to their fluctuations. The actual relationship between anxiety or depression and pregnancy outcomes, though, is unclear. Evidence garnered so far reveals anxiety and depression to be unrelated to quantitative indices of maternal and neonatal outcomes. When global classifications of pregnancy outcomes, such as number of antepartum, intrapartum, and neonatal complications, are employed, the relationships between anxiety, depression, and pregnancy complications are not as clear: some researchers report evidence suggesting that anxiety, and in particular, state anxiety, is related to the occurrence of pregnancy complications, while others provide evidence to the contrary. The use of different measures of anxiety may account for these differences. Based on the findings of the former studies, however, it is impossible to determine whether high levels of anxiety or

depression caused pregnancy complications, or whether anxiety and depression levels increased because of the existence of pregnancy complications (Norbeck & Tilden, 1983).

Stressful Life Events and Pregnancy Complications

According to life event theory, a large number of stressors, particularly negative and unwanted events, experienced in a short period may predispose an individual to the development of medical or psychological conditions (Dohrenwend & Dohrenwend, 1978). Stressful life events in most cases are assessed by the Recent Life Events Schedule (Holmes & Rahe, 1967), or variations of it. To complete this measure, respondents indicate which stressful events they have experienced over the past 6 to 12 months. Each event is weighted for stressfulness and the final score reflects the amount of change required to adapt to the occurrence of the events. Indeed, research has shown that the occurrence of many stressful events within a relatively short period is associated with heart disease and myocardial infarction (Blumenthal et al., 1987; Rahe & Paasukivi, 1971; Theorell & Rahe, 1971), tuberculosis (Holmes, Hawkins, Bowerman, Clark, & Joffe, 1957), glaucoma (Cohen & Hajioff, 1972), and depression (Brown, 1974; Brown & Harris, 1978; Markush & Favero, 1974), among others.

Research examining the relationship between stressful life events and subsequent pregnancy outcome, however, has produced equivocal results. Georgas, Giakoumaki, Georgoulias, Koumandakis, and Kaskarekis (1984), Gorsuch and Key (1974), Newton, Webster, Binu, Maskrey, and Phillips (1979), Newton and Hunt, (1984), Rizzardo et al., (1982), Schwartz (1977), and Williams, Williams, Griswold, and Holmes (1975), for example, reported that women experiencing a high number of stressful life events, particularly during the second and third trimesters, had a higher incidence of maternal and neonatal complications than women experiencing fewer stressful life events during pregnancy. The complications that occurred, however, showed no consistent pattern from study to study. Conversely, others, such as Berkowitz and Kasl (1983), Chalmers (1983), and Nuckolls, Cassel, and Kaplan (1972) found stressful life events to be a weak predictor of adverse pregnancy outcomes. With respect to quantitative indices of pregnancy outcome, Molfese et al. (1987a, b) found that stressful life events were significantly associated with stage 2 labour; as levels of life stress increased, length of stage 2 labour decreased. Further, higher levels of life stress were significantly associated with shorter gestational periods (Molfese et al., 1987a).

It seems reasonable to assume that high levels of stress would be associated with pregnancy complications, yet

the results of the aforementioned studies do not consistently endorse this belief. One possibility may be that different criteria were used regarding maternal and neonatal complications. Additionally, perhaps greater consideration needs to be directed towards the problems and limitations inherent in the measures of stressful life events, for these problems and limitations may account for some of the discrepant findings.

Rabkin and Struening (1976) correctly pointed out that stressful life events, regardless of whether they were significantly related to outcome, typically accounted for a very small proportion of the total variance. This may be due to the actual life events measures employed in these studies. The measures most commonly used in these studies were the Recent Life Events Schedule (Holmes & Rahe, 1967), or variations of this measure, which require the respondent to recall the occurrence of events over a 6 month and 12 month time span. Retrospective recall of stressful life events has been shown to be relatively unreliable, due largely to respondents failure to recall events (Funch & Marshall, 1984; Jenkins, Hurst, & Rose, 1979; Klein & Rubovits, 1987; Monroe, 1982; Yager, Grant, Sweetwood, & Gerst, 1981). This being the case, it follows that life events scales as measures of stress must be inaccurate, and, therefore, misleading.

Second, life event measures contain few stressful events that are directly relevant to, or frequently experienced by, pregnant women (Lobell, 1994). The events listed in the schedules are largely events that older, rather than younger, adults typically experience. Many of the events included, though admittedly stressful, rarely occur. Lack of endorsement of events does not mean the individual has not experienced stressful situations; it merely reflects the limited scope of the measure.

Third, "objective" measures of life events imply that the events themselves were the precipitating cause of poor psychosocial adjustment, illness behaviour, or pregnancy complications for example (Cohen, Kamarck, & Mermelstein, 1983). This position ignores the fact that it is not the events themselves that determine stressfulness but rather one's "perception" or appraisal of the events as personally threatening that may have negative psychological effects (Thoits, 1986). Although recent researchers employed life events measures that included self-ratings of event stressfulness, the increase in predictability provided by these ratings was small (Cohen et al., 1983), and still did not eliminate problems associated with fall-off in event recall.

Finally, Gochman (1979), Keating (1979), and Worchel (1978) among others, have found that people, when under chronic stress, tend to misattribute their feelings of

stress to a particular source, or sources, when the stress
is actually due to another source. That is, individuals
under stress often experience the "stress," but in their
search for the cause of their discomfort, they may
misidentify the actual source of their stress in an effort
to make sense of their discomfort.

Despite the discrepancies among the aforementioned
studies, as well as the problems associated with the use of
life events measures, there is a growing body of research
devoted to the identification and evaluation of intervening
psychosocial factors that may allay the effects of maternal
stress, anxiety, and depression on pregnancy outcome. This
is important, because individuals facing the same stressors
do not manifest the same degree of distress; under stressful
life conditions, some individuals manifest high levels of
distress, while others, facing the same difficulties, are
not as adversely affected. Recently, the potentially
protective or buffering effects of social support on stress
have received considerable attention. Social support, the
buffering hypothesis, and the buffering effects of social
support on stress will be reviewed in the sections that
follow.

Chapter 2

SOCIAL SUPPORT

Over the past 20 years, there has been a burgeoning
body of research examining the bases of social support. One
sentiment commonly echoed through much of the social support
research was that a lack of consensus exists regarding the
conceptualization and measurement of social support. These
criticisms are certainly true for much of the early research
on social support. The current picture that emerges,
though, is that of an area almost overrun, not so much with
conflicting conceptualizations, but with a plethora of
conceptualizations and taxonomies, many of which proffer
different perspectives and nuances of social support.
Depner, Wethington and Ingersoll-Dayton (1984) correctly
point out that the term "social support" has come to
represent a general rubric comprising a number of more
specific definitions and conceptualizations. In the
sections that follow, the more common conceptualizations of
social support will be examined.

Defining Social Support

When we speak of "social support," we are usually
referring to the functional content of social relationships,
that is, the help we receive from others. In this respect,

"support" commonly connotes help, aid, assistance, nurturance, and comfort, for example, that can be directly or indirectly conveyed through actions, words, and deeds. Implied in the concept of support is that the actions, words, or deeds have an intended purpose or positive effect, typically to allay adversity or psychological discomfort. This, of course, will not always be the case, for there will be instances where actions meant to be supportive will, in actuality, be counterproductive, and in other cases, actions occurring simply in the course of everyday interaction will have an unintended support quality. "Social" support implies that this help, assistance, or comfort is a product of, or is derived from, interpersonal relationships.

The aforementioned ideas reflect a converging representation of social support in the literature; that is, social support is an interpersonal transaction involving the expression of comfort and positive affect, as well as the provision of help or aid, such as information and materials for example (Antonucci, 1985; Antonucci & Israel, 1986; House, 1981; Kahn & Antonucci, 1980). Support is intended by the donor, or perceived by the recipient, to be beneficial to the recipient (Shinn, Lehmann, and Wong, 1984).

Implicit in this conceptualization is the view that social support can be viewed from two perspectives: (1) enacted support and (2) perceived social support. Enacted

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support refers to actual helping behaviours, such as actions, words, and deeds, that others perform when they provide assistance to the recipient (Barrera, 1986). Enacted support is also referred to as "received" support. Perceived social support refers to the "generalized appraisal that individuals develop ... that they are cared for and valued, that significant others are available to them in times of need, and that they are satisfied with the relationships they have" (Heller, Swindle, & Duesenbury, 1986, p. 300). This conceptualization of perceived social support emphasizes several components: first, the degree to which the recipient feels that support is available or accessible; second, the degree to which the recipient feels supported; and third, the degree to which the recipient feels satisfied with the support rendered (Sarason & Sarason, 1985; Schaefer, Coyne, & Lazarus, 1981).

Perceptions of social support are based not only on current instances of enacted support, but also on past occurrences of enacted support as well. Past instances of enacted support are required before one can develop some sense or belief that he or she can reliably count on others for support when needed. Unlike enacted support, though, perceived social support is concerned with the focal person's perceptions or beliefs of support available or rendered, rather than with actual instances of helping behaviours provided to the focal person.

Enacted support and perceived social support embrace
two commonly examined dimensions: (1) types of support, and
(2) sources of support. Both of these dimensions will be
discussed in subsequent sections.

Types of Support

Researchers have identified and examined three types of
social support: emotional support, informational support,
and instrumental support. Emotional support refers to
demonstrations or assertions of love, caring, esteem, value,
empathy, sympathy, and group-belonging (Thoits, 1985,
p. 53). Emotional support, also referred to as esteem
support and expressive support, is what most people mean
when they speak of social support (Turner, 1983).
Informational support includes the communication of opinion,
facts, guidance, suggestions, and advice relevant to a
person's current difficulties that might make an
individual's life circumstances easier to manage (Thoits,
1985, p. 53). This type of support has also been called
cognitive support or advice. Instrumental support refers to
actions or the provision of materials that enable the
fulfillment of ordinary responsibilities, such as household,
childrearing, financial, and job-related obligations
(Thoits, 1985, p. 53). Instrumental support has also been

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called practical support, tangible support, or material support.

The operationalization of supportive functions, as can be expected, has taken different forms. From the perspective of enacted support, supportive functions can be operationalized objectively in terms of the quantity of support to which people have access, the existence and number of specific relationships that provide support functions, the likelihood that a family member or friend would perform a specific supportive function, (e.g., Vaux, Riedel, & Stewart, 1987), or the frequency with which different forms of support are received over a specified period (e.g., Barrera, Sandler, & Ramsay, 1981; Collins, Dunckel-Schetter, Lobel, and Scrimshaw, 1993). Objective measures of supportive functions are meant to reflect actual support transactions. This approach views supportive functions as resources or commodities to be exchanged, and typically focuses on the objective availability or utilization of such aids. Measures of enacted social support require the respondent to recall actual supportive behaviours received in the recent past. As such, it is reasonable to assume that they are subject to the same fall-off in recall as has been found to affect life events measures (Wilcox & Vernberg, 1985).

From the perspective of perceived social support, supportive functions are often characterized in terms of

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beliefs individuals have regarding the availability and adequacy of, and satisfaction with, emotional support, practical support, and informational support. The evaluation of usefulness of, or satisfaction with, support is made by the recipient.

The distinction between different types of support is important to consider because they may have independent effects on physical and mental health (Schaefer et al., 1981). To be useful, the type of support offered must meet the needs of the recipient. For example, the recently bereaved would probably benefit most from emotional support. In contrast, the poor graduate student would probably find tangible support in the form of money to be more useful than emotional support. In other words, different types of support are not necessarily interchangeable with one another.

The clear and consistent differentiation among the various supportive functions, however, has been problematic for most researchers. For example, House (1980), Sarason, Shearin, Pierce, and Sarason (1987), and Schonfeld (1991), using the Interpersonal Support Evaluation List (ISEL), designed to measure different types of perceived social support, found that the scales were moderately to highly correlated with one another suggesting that they measured the same construct. Other researchers, using different measures to assess emotional, practical, and informational

support, have run into similar problems differentiating among the different types of support (e.g., Brown, 1986; Norbeck & Tilden, 1981; Schaefer et al., 1981). This is not necessarily surprising, though, because mobilization of one type of support may explicitly, or implicitly, mobilize other types of support as well, making it difficult to distinguish between the different types of support (Sarason, Shearin, Pierce, & Sarason, 1987; Schonfeld, 1991). In general, it may be that one type of supportive function may serve different functions (Schonfeld, 1991). More specifically, emotional support is often implicit in tangible support and informational support. For example, the receipt of tangible or informational aid is likely to convey the idea that one is cared for, a component of emotional support. As such, emotional support may be inextricably tied to other forms of support so much so that they cannot be reliably distinguished from one another. So while distinguishing between different types of support makes sense theoretically and intuitively, in practice, this has been difficult to accomplish (Herzberger & Potts, 1982).

Rather than differentiating among the various types of support, some researchers have employed "compound" measures of functional support (Cohen & Wills, 1985). Compound measures, such as the Perceived Social Support (PSS) scale (Procidano & Heller, 1983) and the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, &

Farley, 1988), combine various items tapping emotional, practical, and informational support, producing a single outcome score. In most instances, however, these compound measures appear to tap primarily emotional support.

Sources of Support

Perhaps one of the most basic elements affecting the availability of any type of support involves the existence of people in our "social network." Social networks refer to "individuals or groups with whom a particular individual is in contact" (Bott, 1971, p. 320). Individuals must have some form of contact with others before support can be exchanged. Indeed, research has shown that individuals who are relatively isolated, or have few social relationships, experience more symptoms of poor mental health, such as anxiety and depression (e.g., Henderson, Byrne, & Duncan-Jones, 1981; Williams, Ware, & Donald, 1981), and an increased risk of mortality from all causes than do individuals with moderate to high levels of social relationships (e.g., Berkman & Syme, 1979; Blazer, 1982; House, Robins, & Metzner, 1982). Individuals with spouses, family, and friends who are largely supportive generally experience better physical and emotional states (e.g., Broadhead et al., 1983; Leavy, 1983; Mitchell, Billings, & Moos, 1982).

More relationships, however, do not necessarily mean more, or better, support (Schaefer et al., 1981). McFarlane, Norman, Streiner, and Roy (1986) found that individuals with the largest network of helpers most often felt least helped. The mere existence of relationships, therefore, does not mean that support is forthcoming, or that it is useful. It is more likely that the nature and quality of the social relationships, in terms of intimacy, affection, and willingness to help, for example, rather than their mere existence, account for the beneficial effects of social relationships (House & Kahn, 1985). Further, not all relationships are supportive, and those that are largely supportive, are not necessarily supportive all the time (Lin, Woelfel, & Light, 1985).

In most instances, people rely on the members of their immediate family as their major source of support (Dean & Lin, 1977). More specifically, the spouse represents the largest proportion of helpers in one's social network (Griffith, 1985), and functions as the individual's key confidant (Brown, 1978). Research has also shown that "all sources of support are not equally effective for a given problem" (Wilcox & Vernberg, 1985), and that the source of support, not the amount of support, is critical to adaptation to stressful life events (Lieberman, 1982). In other words, relationships are neither substitutable, nor interchangeable (Weiss, 1976). Brown and Harris (1978)

found that the marital relationship is a woman's most important source of support; a confiding relationship with others, such as a parent, sister, or friend, does not compensate for the lack of a confiding relationship with her spouse in terms of vulnerability to depression. Other researchers have reiterated this finding as well; individuals who have a confidant enjoy better mental health than those without a confidant (e.g., Brown, 1978; Lieberman, 1982; Lowenthal & Haven, 1968; Miller & Ingham, 1976; Paykel, Emms, Fletcher, & Rassaby, 1980; Surtess, 1980).

What makes some sources of support more effective than others? There are several factors to consider. According to Lin et al. (1985), individuals within our immediate social network who are connected by common interests and concerns are the most effective sources of support. Thus, a certain degree of affiliation and positive emotional attachment or involvement is a necessary component of effective social support. The marital relationship is one such relationship where strong ties and similar interests are assumed to exist. Thoits (1986) also states that individuals who are socially similar to the recipient are more likely to provide effective support. Socially similar individuals refer to others who have faced and successfully dealt with the same challenges as the recipient, or who are currently facing and are successfully coping with the same

challenges (Thoits, 1986). Further, the individual is likely to look to others for support who share similar characteristics and values, increasing the likelihood of perceived empathic understanding (Thoits, 1986). In terms of pregnancy, this may mean that the pregnant woman's mother, or her girlfriends who have experienced pregnancy, or who are currently pregnant, for example, would be effective sources of support regarding pregnancy concerns.

A comparison between different types and sources of support from the perspectives of enacted support and perceived social support is difficult because there are no studies that have systematically examined the various dimensions and perspectives. Evidence gleaned from a number of studies relying on compound measures of enacted social support and perceived social support indicates that perceived social support is a better predictor of physical and psychological well-being than enacted support (Barrera, 1981; Blazer, 1982; Cohen, McGowan, Fooskas, & Rose, 1984; Cohen & Syme, 1985; Hirsch, 1980; Wethington & Kessler, 1986). For example, Barrera (1981) found adequacy of support, rather than the number of supporters one has, or the quantity of supportive behaviours to which one has access, to be better predictors of well-being. Moreover, Sarason, Levine, Basham, and Sarason (1983) found that the number of individuals available to provide support to be weakly related to satisfaction with support.

This brief overview of social support raises some important issues about the functional aspects of social support and the sources of social support. In particular, "what type of support and how much of it, from whom, is most useful, when and under what circumstances?" This is an important question because not all support received from others is useful or helpful. The degree to which support can be judged to be efficacious depends on the "fit" between the support needed and the support offered or received (Thoits, 1985, Wilcox & Vernberg, 1985). The amount and type of support offered must match the coping requirements elicited by the stressor or stressors (Cohen, Mermelstein, Kamarck & Hoberman, 1985, p. 74). Further, people may rely on different sources of support for different types of support to cope with different types of stressors (Shinn, Lehmann & Wong, 1984). The type of support provided also may vary according to the source (Stewart, 1989, p. 268). These issues speak not only to the multidimensional nature of support, but also to the interactive processes involved between the environment and the person. The relationship between support and stress needs to be considered when examining the bases of social support.

Because stress is a process that changes over time, the type and amount of support must change to meet the changing nature of stress (Depner et al., 1984; Shinn et al., 1984). In some instances, too much support may engender feelings of

dependency, undermine self-confidence, and interfere with active attempts to resolve or adjust to stressful life events (Shinn et al., 1984). In contrast, too little support may leave the individual feeling overwhelmed by one's difficulties, as well as estranged from others (Shinn et al., 1984). The amount of support required will depend on the individual and the difficulties encountered.

The type of support needed will change as the effects of the stressor change over time. For example, at the onset of a crisis, emotional support is the type of support an individual finds most useful, for it provides reassurance that others are willing to help during times of distress (Jacobson, 1986). But as the initial shock of the crisis wears off, and the reality of the situation sets in, then informational support is required to help the individual grasp, and come to terms with, the meaning of the change precipitated by the crisis; and subsequently, practical support becomes relevant as well, by helping the individual cope with the new demands that may ensue from the crisis (Jacobson, 1986). While this provides a useful guideline to consider regarding the timing of support, the actual situation must be considered because in some instances, a combination of supportive functions may be required. For example, in the case of bereavement, emotional and practical support may be required at the same time (Jacobson, 1986). Similarly, the type, or types, of social support required

during pregnancy may change at different points during the pregnancy.

Some situations, because of their very nature, affect or influence the availability of support, or the individual's perception that support is available. For example, the individual with AIDS may often feel isolated and shunned by family and friends due to the social stigma associated with the disease. The accompanying fear the disease engenders may reduce the willingness of others to provide support (Shinn et al., 1984). In contrast, the occurrence of other life events, either positive or negative in quality, that are not encumbered with social stigmas may lead to the spontaneous provision of support such as sympathy, encouragement, financial aid, advice, or assistance around the house. Pregnancy is most often considered to be a positive life event, where spontaneous provision of support is the norm.

The duration of distress also may influence the provision of support (Shinn et al., 1984; Vaux, 1988). Support is often provided, or mobilized, relatively quickly at the onset of distress. If distress continues over a prolonged period, then the donors may begin to feel distressed themselves, and support proffered may diminish or cease to be offered. Pregnancy, of course, is a time limited event, averaging approximately 40 weeks in duration.

Summary

     Support, then, is usually provided by individuals in
our immediate social network, most visibly during times of
stress or difficulties. For support to be useful, the
individual must perceive that support is first available,
and that it is accessible when the need arises (Cohen &
Wills, 1985; Schonfeld, 1991; Thoits, 1985; Turner, 1983).
The support must fit the needs of the recipient, and the
recipient must be satisfied with the amount and the quality
of the support provided. Finally, sources of support are
not necessarily interchangeable; in some instances, only the
support from a specific individual, or from a few, will
assuage one's distress.

Social Support and Pregnancy

     Presently, it is unclear whether women find certain
types of support more useful than others during their
pregnancy, or whether certain types of support are more
useful at different times during their pregnancy.
Researchers, such as Holmes and Rahe (1967), Wandersman,
Wandersman, and Kahn (1980), and Norbeck and Tilden (1983),
among others, have noted that the birth of a child can be a
stressful experience, constituting a transition period,
particularly for first time parents. Being a transition
period, the parents must come to terms with the meaning of

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becoming a "parent." This would suggest that informational support would be the appropriate type of support for the new parents, and educational programs, such as prenatal childbirth classes would be appropriate vehicles for informational support. Jacobson (1986) cites research disputing this claim; for though information was provided about labour, delivery, and breathing techniques, most women indicated that the group discussions were most helpful because they could express their concerns and worries, and this helped to strengthen their self-esteem and resolve. During pregnancy, Jacobson (1986) also suggests that parents-to-be find emotional support during the third trimester to more helpful than informational support about postpartum childcare, because postpartum childcare is a less pressing concern than the imminent task of childbirth. During the third trimester, the woman, owing to the physical limitations that pregnancy places on the completion of daily activities, may find that practical support takes on greater importance as well.

There is relatively little research examining the importance of different support sources during pregnancy. Moss, Bolland, Foxman, and Owen (1986) found that more than 90% of the women in their study identified their spouses as their closest confidant. This finding is not unexpected. Other investigators (e.g., Lieberman, 1982; Tietjen & Bradley, 1985) go further, stating that support from other

relationships, such as family members and friends, though important, does not compensate in the absence of support from her husband during pregnancy. Tietjen and Bradley (1985) found that amount of, and satisfaction with, support from the husband was negatively, and significantly, correlated with perceived stress and depression, but not with anxiety, during the third trimester. Conversely, supportiveness of, and satisfaction with support from, network members showed similar but weaker relationships with perceived stress, depression, and anxiety.

These findings, however, are more provocative than definitive, given the unestablished validity of their measures of social support, and the cross-sectional nature of their study. Their research cannot rule out whether other sources of support can provide support that the husband, by virtue of being male, cannot provide for his pregnant wife. The husband, in one sense, can experience pregnancy vicariously only. Other women who have experienced pregnancy, such as the pregnant woman's mother or female friends, may be in a better position to understand the support needed during pregnancy. Though spousal support is an important source of support for most women during pregnancy, the support provided by others, such as family and friends, may be equally important, but for different reasons.

To date, there is a circumscribed body of research examining the relationship between social support and pregnancy complications and outcomes. On an intuitive level, one would expect that higher levels of social support would be associated with lower complication rates, and better intrapartum and neonatal outcomes. Research, however, does not consistently bear out this contention. Studies employing measures of enacted social support have found that higher levels of social support were either associated with a higher percentage of maternal and fetal complications (e.g., Rizzardo et al., 1985), or unrelated to pregnancy complications (e.g., Boyce, Schaefer, & Utti, 1985; Rizzardo et al., 1988). Adler and Hayes (1990) and Smilkstein, Helsper-Lucas, and Ashworth et al. (1984) found that perceived availability and adequacy of network support and perceived satisfaction with family support, respectively, to be weakly associated with maternal and neonatal complications. Norbeck and Tilden (1983), on the other hand, found higher levels of perceived tangible support were associated with fewer labour and neonatal complications. Perceived emotional support was weakly correlated with pregnancy complications.

Other researchers such as Molfese et al. (1987a), Pagel, Smilkstein, Regan, and Montano (1990), and Turner, Grindstaff, and Phillips (1990) have examined the relationship between perceived social support from spouse,

family, and friends and quantitative indices of pregnancy
outcomes. Molfese et al. (1987a) found that perceived
social support from spouse, family, and friends was weakly,
as well as negatively, related to neonatal outcome measures
such a birth weight, gestational age, and 5-minute Apgar
score, and positively related to the duration of the first
stage of labour. Pagel et al. (1990) found that perceived
family support was positively correlated with Apgar scores
at 5 minutes, but weakly associated with gestational age.
Turner et al. (1990) found higher levels of perceived
support from family members, but not from one's spouse, was
associated with higher birth weights.

While support measures, as single variables, appear to
be weak determinants of pregnancy outcome, researchers have
begun to examine the relationship between stress, social
support, and obstetrical outcomes. The basis of this line
of research was to use these psychosocial variables to
identify women who were at risk for adverse pregnancy
outcomes. Although this research has largely produced
disparate findings, there is one general result that is
consistent among them all: measures of social support in
combination with measures of stressful life events were weak
predictors of pregnancy complications (e.g., Chamlers, 1983;
Smilkstein et al., 1984), gestational age (e.g., Molfese et
al., 1987a; Pagel et al., 1990), duration of stage 1 and
stage 2 labour (e.g., Molfese et al., 1987a), and birth

weight (e.g., Molfese et al., 1987a; Pagel et al., 1990).

In most instances, pregnancy outcomes were best predicted by obstetrical variables, such as risk level (e.g., Molfese et al., 1987a; Smilkstein et al., 1990). However, even obstetrical variables frequently accounted for very little variance in the pregnancy outcomes.

Summary

These studies indicate that enacted social support is largely unrelated to pregnancy complications. Type and source of social support, alone or in combination with stressful life events, were largely unrelated to the occurrence of pregnancy complications, or at worst, were implicated in poorer intrapartum and neonatal outcomes.

The relationship between perceived social support and pregnancy outcomes is more difficult to sort out, given the different measures of perceived social support employed by the few studies that exist. Further research is required before more definitive statements can be made regarding the relationship between perceived social support and obstetrical outcomes can be made. When stress measures were included into the prediction equation, the stress and perceived support variables, in any combination, accounted for very little variance in the obstetrical outcome measures. In other words, together they were poor

predictors of adverse pregnancy outcome, regardless of whether outcomes were classified in terms of complications, such as maternal or neonatal complications, or quantitative indices, such as birth weight or gestational age, for example.

It is clear from this research that the putative relationship between social support and pregnancy outcomes has been based more on reasoned expectations than empirical evidence. More recently, researchers have explored the conditions under which social support may have beneficial effects. This body of research has provided evidence suggesting that the beneficial effects of support may be most prominent under conditions of high stress. The differential effects of support under varying levels of stress has been referred to as the "buffering" effects of social support.

The Buffering Effects of Social Support

As discussed earlier, the pathognomic effects of stress on health, both physical and psychological, have been well documented in the literature. There is a growing body of research suggesting that social support may "buffer" or allay the harmful effects of stressful life events on psychological and physical health (Cassel, 1976; Cobb, 1976; Henderson, Byrne, Duncan-Jones, et al, 1978; Kaplan, Cassel,

& Gore, 1977). According to the buffering hypothesis, social support modifies or attenuates physical and mental health problems, but only in the presence of high stress conditions or adversity (Cobb, 1976; Cohen & Wills, 1985; Lin et al., 1985). The physical and mental health effects of stress will be most pronounced for those individuals with little or no support. When support levels are low, the relationship between life stress and sickness should be strongly positive during periods of high life stress. Conversely, when support levels are high, the relationship between life stress and illness should decrease under similar circumstances (Wilcox, 1981). At relatively low levels of stress, social support is irrelevant to the situation because there is little or nothing to buffer (Gore, 1985; Lin et al., 1985).

Statistically, the buffering model specifies that an interaction exists between the stress variable and the moderator variable, in this case, social support (Aneshensel & Stone, 1982; Kaufmann & Beehr, 1989). A significant relationship between the interaction term and symptomatology indicates that the effect of stress on symptomatology differs at varying levels of social support (Aneshensel & Stone, 1982; Barron & Kinney, 1986; Kaufmann & Beehr, 1989; Lin et al., 1985). This type of interactive effect is portrayed, graphically, in Figure 1. In this figure, it can be seen that at low levels of stress, social support has

little impact on symptomatology. At high levels of stress, however, individuals with low levels of social support experience higher levels of symptomatology. That is, the relationship between stress and symptomatology is strongly positive. In contrast, at high levels of stress, individuals with high levels of social support, experience little or no change in level of symptomatology; there is a weak relationship between stress and symptomatology. Overall, then, the positive relationship between stress and symptomatology is weaker in the presence of strong social support than in the presence of weak social support (Kaufmann & Beehr, 1989).

To test the buffering effects of social support, two requirements must be met. First, there must be a significant relationship between the stress variable and the outcome variable; this requirement ensures there is adequate measurement and range of scores for the variables (Cohen & Wills, 1985). Second, the measures of stress and social support must be nonoverlapping to avoid overestimation of any buffering effects (Cohen & Wills, 1985; Quittner et al., 1990; Thoits, 1982). Statistically, this means that measures of stress and social support are not highly correlated with one another. If measures of stress and support were highly correlated, then this would indicate that they were measuring the same thing, possibly changes in social relationships. Cohen and Wills (1985) cogently

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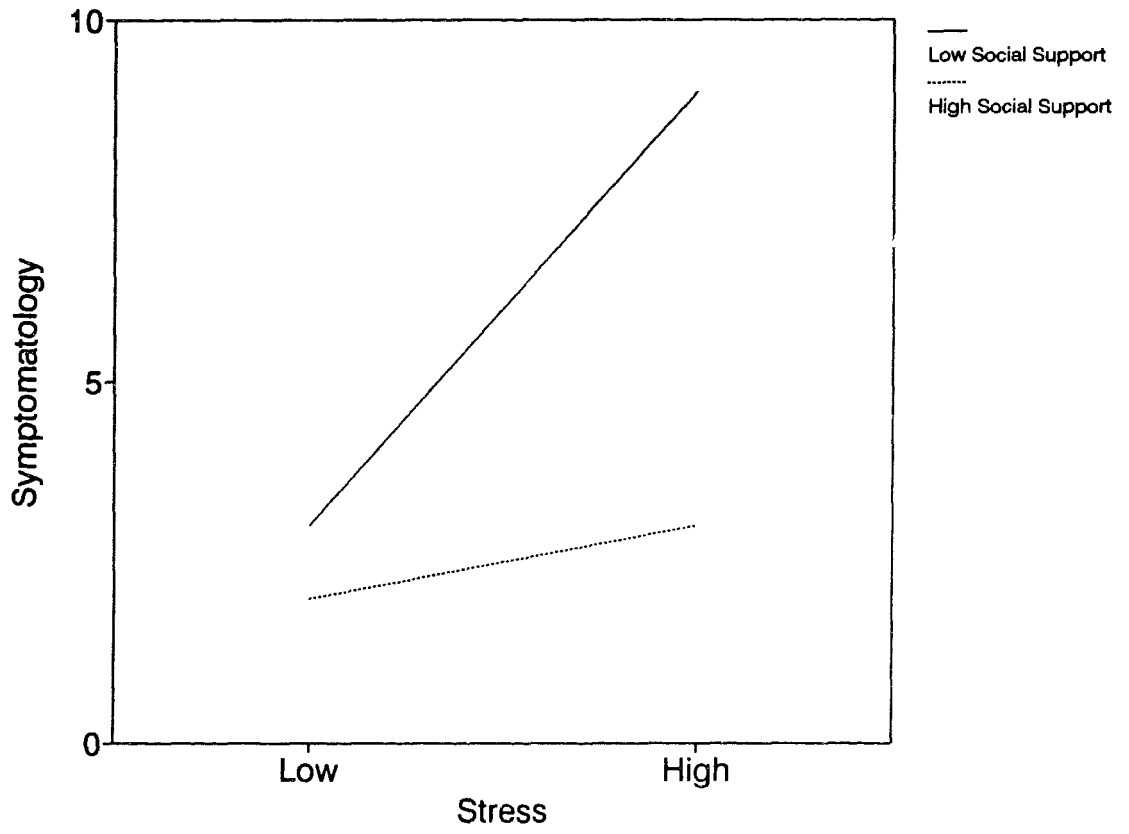
Figure 1: Buffering effects of social support on stress and symptomatology

illustrate the problems associated with correlated measures of stress and support. In their example, individuals may experience increased symptomatology due to disruptions in social support, such as those ensuing from death of a spouse, separation, or divorce, for example. As such, these individuals would report high levels of stressful life events and low levels of support. The marked elevation in symptomatology that these individuals report may not occur because of an interaction effect, but because of an elevated stress level due to losses in social support.

The buffering effects of social support are assumed to be cognitively mediated (Quittner et al., 1990; Cohen & Wills, 1985; Cohen et al., 1985, Thoits, 1986). When an event or incident is perceived to be stressful, individuals usually engage in some form of coping activity; seeking or obtaining social support can be seen as a form of coping assistance (Gore, 1978; Thoits, 1986; Wilcox & Vernberg, 1985). Coping, according to Lazarus and Folkman (1984), refers to the "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p.141). Social support as coping assistance, therefore, can be seen as a resource that facilitates coping with, or managing, perceived stress (Thoits, 1986; Stewart, 1989). The perception that social support is available, or provided and received, may operate by influencing or

altering one's appraisal or interpretation of experienced stress, by inhibiting maladaptive coping responses, by facilitating more adaptive responses, and by bolstering self-esteem (Cohen et al., 1984; Heller et al., 1986; Stewart, 1989; Thoits, 1986). Cohen and Wills (1985) suggest that the buffering effect is likely to occur when the specific support function provided matches the needs elicited by the stress experienced by the individual. For example, the perception that emotional support is available, or that its provision has been useful, can help assuage an individual's negative, affective response to appraised stress, and bolster self-esteem and self-confidence (Pearlin, Lieberman, Menaghan, & Mullan, 1981). As a result, the distressed individual may redouble his or her coping efforts in dealing with life adversities. Indeed, research has shown self-esteem to increase with the receipt of support (Lakey & Cassady, 1990). Informational support may mollify the impact of the stress appraisal by providing the individual with alternative strategies to cope with the stress, by redirecting inappropriate coping activities, or by reinterpreting the perceived importance of the stress experience, thereby reducing the perceived threat (Cohen & Wills, 1985; House, 1981; Wilcox & Vernberg, 1985). Practical support can alleviate the feelings of stress by providing tangible resources that help the distressed individual change, or cope with, stressful situations.

For any type of support to be useful, it is reasonable to assume that the individual must perceive that support is first available, and that it is accessible when the need arises (Cohen & Wills, 1985; Schonfeld, 1991; Thoits, 1985; Turner, 1983). If the individual does not see that support is available, then it obviously cannot be utilized. Sarason et al. (1987) further point out that though support is often communicated through our words and actions, the offer or receipt of these does not constitute social support (p. 830). The manner in which the supportive activity is perceived or interpreted by the recipient accounts for its beneficial effects (Heller et al., 1986). A well-intentioned comment or action may be unsupportive or counter-productive if it is perceived to imply negative inferences about one's abilities to deal with life's challenges. Unwanted advice or emotional support that is perceived as an invasion of privacy may cause distress rather than alleviate it (Shinn et al., 1984). If the individual does not believe that the support offered is useful, then it likely will be rejected. So what one person finds supportive, another may find unsupportive or unhelpful. Support, therefore, is judged by its potential benefits and costs; it must lead to outcomes that are beneficial, or perceived to be beneficial, by the recipient, and it must not invite further hardship.

There are a number of studies that have examined the buffering effects of supportive functions, and of different sources of support, on stress and physical and psychological symptomatology. In some of these studies, measures of enacted support (i.e., supportive functions received) were used, in others, measures of perceived social support (i.e., perceived availability of supportive functions) were employed. In almost all of them, life event measures were used to assess levels of stress. A few of the studies have looked at perceived support from different sources as well.

Researchers examining the effects of enacted support on stressful life events and symptomatology have not found a buffering effect (e.g., Barrera, 1981; Cohen & Hoberman, 1983). In these studies, enacted support referred to the amount of emotional and tangible aid actually received by an individual over the past month. In an additional study, Cohen et al. (1984) examined the stress buffering effects of perceived and enacted support. Cohen et al. (1984) found that perceived social support buffered the effects of negative life events on physical and depressive symptomatology: enacted social support did not. These researchers also found positive correlations between negative life events, symptomatology, and enacted supportive functions; that is, higher levels of enacted support were associated with higher levels of life stress, and with higher levels of symptomatology. It should not be

surprising, therefore, that these studies did not find a buffering effect. According to Cohen and Wills (1985), these findings may suggest that support received in the past may "reflect psychological distress, which leads to increased use of support."

In an additional series of studies conducted by Cohen and his colleagues (Cohen and Hoberman, 1983; Cohen et al., 1985), they found that perceived availability of emotional support, but not tangible support, buffered the effects of stressful life events on depressive and physical symptomatology. At high levels of stress, those with high levels of perceived emotional support experienced fewer depressive and physical symptoms than those with low levels of emotional support. At low levels of stress, emotional support had no impact on depressive symptomatology. With respect to physical symptoms, however, those with high levels of support experienced a greater number of physical symptoms under low levels of stress, a finding that runs counter to the buffering model of social support. Common throughout these studies was the finding that tangible support did not buffer the effects of stressful life events on physical or depressive symptomatology. In contrast, Schaefer et al. (1981) found tangible support, rather than emotional support, to be a better predictor of depression. In their study, emotional support was weakly associated with depression. The individual support scales used by Schaefer

et al. (1981), however, were highly correlated with one another, suggesting that their measure did not adequately differentiate among the different types of support.

In a cross-sectional study, Wilcox (1981) found that perceived availability of social support, as assessed by a compound measure of supportive functions, served as a buffer between stressful life events and psychological distress. Turner (1983) used a series of vignettes to assess perceived social support. Each vignette described the social support three individuals received in various situations, ranging from low to high levels of support. For each vignette, subjects indicated which individual they were most like. Using this approach, Turner found that perceived social support did not buffer the effects of negative life events on symptoms of anxiety or depression.

While the previously cited studies examined the effects of supportive functions on stress and symptomatology, there are a few studies that have investigated the buffering effects of different sources of support. Brown, Bhrolchain, and Harris (1975), Paykel, Emms, Fletcher, Rassaby (1980), and Surtees (1980), among others, have found that support from one's confidant, but not from other family members or friends, buffered the effect of severe negative life events, and this finding was consistent regardless of the type of measurement procedure used to index confidant relationships (Cohen & Wills, 1985). In these studies, it was assumed

that the existence of a confidant implied availability, and adequacy of, different supportive functions, and in particular, emotional support. In a more comprehensive study, Henderson and his colleagues (Henderson, 1980; Henderson, Byrne, Duncan-Jones, Scott, & Adcock, 1980) examined not only availability of relationships that provided emotional support, but also the adequacy of support. They found that support from a confidant, particularly in terms of adequacy of support, mollified the effects of extreme, negative life events on depressive symptomatology.

The aforementioned research relied on life events measures to assess levels of stress. Cohen et al. (1985), Cohen, Sherrod, and Clark (1986), House and Wells (1978), LaRocco, House, and French (1980), and LaRocco and Jones (1978), in contrast, employed measures of perceived stress. Measures of perceived stress, unlike measures of life events, are not tied to the occurrence of specific events, and are concerned more with one's current life situation rather than events occurring over the past 6 to 12 months. As such, they avoid many of the problems associated with measures of life events, as discussed earlier.

In a smoking cessation program, Cohen et al. (1985) found that perceived availability of emotional support buffered the effects of perceived stress on physical symptomatology. Similarly, Cohen et al. (1986) reported

that perceived availability of emotional support, but not tangible support buffered the effects of perceived stress on depressive symptoms in college freshmen.

In the studies conducted by House and Wells (1978), LaRocco and Jones (1978), and LaRocco et al. (1980), their measures of perceived stress focussed on the assessment of perceived stress in an occupational setting, and included variables such as role conflict, work overload, poor communication between workers and supervisors, and job future uncertainty, among others (Cohen & Wills, 1985). House and Wells (1978) assessed perceived support from supervisor, co-workers, spouse, and friends and relatives. LaRocco and Jones (1978) measured quality of work relations with group leaders and co-workers. LaRocco et al. (1980) assessed perceived availability of emotional and informational support from supervisor, co-workers, and spouse/family/friends. House and Wells (1978) found that perceived support from one's spouse buffered the effects of perceived occupational stress on depressive symptomatology, and perceived support from spouse and supervisor buffered the effects of perceived stress on physical health. Similarly, LaRocco et al. (1980) reported that perceived availability of emotional and informational support from one's co-workers and spouse buffered the effects of perceived occupational stress on anxiety and depression, whereas perceived support from one's spouse also buffered

the effects of perceived stress on somatic complaints. In contrast, the earlier study by LaRocco and Jones (1978) did not find buffering effects of support on self-esteem and physical illness.

Summary

There is growing agreement among researchers that emotional support, particularly from significant others, allays psychological distress more effectively than other types of support (Thoits, 1985), and that support from nonconfidants cannot make up for the lack of emotional support from significant others (Brown et al., 1974; Henderson, 1981; Henderson et al., 1980; Lieberman, 1982). In addition, measures that assess perceived social support, particularly in terms of perceived availability and adequacy of support, provide more consistent evidence of a buffering effect than measures that assess objective components of support. Finally, studies using measures of perceived stress provide more consistent evidence supporting the buffering model (Cohen & Wills, 1985), and circumvent many of the problems associated with the life events measures employed by most researchers in this area.

Buffering Effect of Social Support on Stress and Pregnancy
Outcomes

To date, there is a circumscribed body of research
examining the effects of social support on stress and
pregnancy outcome. Much of the current interest in this
area was generated by a study conducted by Nuckolls et al.
(1972). In their study, primigravidas completed a composite
measure that included items assessing "support" prior to the
24th week of pregnancy, and then completed a life-events
schedule to assess life stress at the 32nd week of
pregnancy. Total obstetrical complications (i.e., maternal
complications and neonatal complications) were recorded for
each woman. Under high levels of stress, they found that
women with high "psychosocial assets" experienced only one-
third the complication rate of women with low psychosocial
assets. In contrast, there was no difference in
complication rate between women with high and low
psychosocial assets when life stress was low. This
evidence, however, was prematurely interpreted by many as an
indication of the buffering effects of social support on
stress and pregnancy outcomes.

The Nuckolls' study can be criticized on several
accounts. The measure of social support used by Nuckolls et
al. was embedded in a composite variable that tapped a
variety of "psychosocial assets." As such, their measure of
psychosocial assets assessed social support indirectly, at

best, and it is impossible to delineate the actual impact social support had on maternal stress and pregnancy outcome. Further, the psychometric qualities of this measure are unknown. Moreover, they did not control for pre-existing medical risk factors that could account for significant relationships between psychosocial variables and obstetrical outcomes. The existence of a medical condition that puts the pregnancy at risk is likely to create a spurious relationship between psychosocial measures and obstetrical outcomes; specifically, the medical condition could cause elevated scores on the psychosocial measures as well as obstetrical complications (Norbeck & Tilden, 1983). Finally, their study was hampered by a 50 per cent attrition rate; given the large attrition rate as well as the aforementioned problems, the validity of their findings remain suspect.

Despite the problems inherent in the study by Nuckolls et al. (1972), it did serve as a springboard for further research in this area. Subsequent studies all shared some basic similarities; life-events schedules were used to assess maternal stress, the number of obstetrical complications were recorded, and in some, quantitative indices, such as gestational age, birth weight, and Apgar scores, were also recorded. Some studies employed measures of enacted social support, and others, measures of perceived social support.

Norbeck and Tilden (1983) largely replicated the earlier study by Nuckolls et al. (1972) and eliminated many of the problems inherent in their study. Early in their pregnancy, women completed a life-events schedule for events occurring over the past year, measures assessing state and trait anxiety and depression, as well as perceived availability of emotional and tangible support. Approximately 6 weeks before delivery, they completed another life-events schedule for events occurring over the past 4 to 5 months. They found that women with high life stress during pregnancy, who had low levels of tangible support, experienced a higher rate of antepartum and neonatal complications; as such, they concluded that tangible support had a buffering effect on life stress and obstetrical complications. Emotional support, on the other hand, did not have a buffering effect. Finally, though they found high life stress and low social support to be significantly related to high emotional disequilibrium, neither emotional nor tangible support were found to buffer the effects of life stress on maternal distress.

The claim that social support buffers the impact of life stress on pregnancy complications is by no means unanimously supported. In a retrospective study, Berkowitz and Kasl (1983) examined the role of emotional support from one's spouse on preterm delivery. They found that women with preterm delivery reported a higher number of life

events occurring during pregnancy than women whose pregnancy went to term. Additionally, women of preterm babies reported lower levels of emotional support from their spouse than mothers of term infants. The amount of emotional support the woman received from her spouse, though, did not moderate the effects of stressful life events on gestational age at delivery.

Smilkstein et al. (1984) assessed support via the number of resources available to help and satisfaction with support resources. They found satisfaction with support resources available to be positively, though weakly, associated with the number of delivery complications. Neither number of support resources, nor satisfaction with support resources, however, were found to buffer the effects of life stress on obstetrical complications.

Pagel et al. (1990) investigated the buffering effects of satisfaction with family support on stress and quantitative measures of neonatal outcome. They found that satisfaction with family support did not buffer the effects of stress on gestational age. Additionally, after controlling for gestational age, satisfaction with family support did not buffer the effects of stress on birth weight or Apgar scores at 1 and 5 minutes.

Other researchers have studied the buffering hypothesis of social support using different populations, such as low-

income women (e.g., Collins et al., 1993; Norbeck & Anderson, 1989) and adolescents (Barrera, 1981; Boyce et al., 1985; Turner et al, 1990). In the study conducted by Norbeck and Anderson (1989), black, Hispanic, and white women from low socioeconomic backgrounds completed a compound measure of social support that included perceived satisfaction with, and perceived availability of, emotional and practical support, as well as an objective measure indexing the sources of support. Life stress, social support, and state anxiety were assessed at mid and late pregnancy. Again, number of gestational, intrapartum, and neonatal complications were recorded, as were gestational age, birth weight, and Apgar scores at 5 minutes. For black women, it was found that higher levels of support from one's spouse were associated with longer gestational periods, and fewer gestational complications; the opposite was found for white women. Social support did not buffer the effects of life stress on pregnancy outcome measures for the black women. For white women, however, they found that the interaction between life stress and social support from one's mother was a significant predictor of long labour, but in the opposite direction of what was expected. Under high levels of stress, women who received high levels of support from their mothers had longer labour periods. Finally, they found no evidence that social support buffered the effects of stress on maternal outcomes for the Hispanic women.

Norbeck and Anderson concluded that the buffering model may not be valid for lower socioeconomic pregnant women.

In a similar study, Collins et al. (1993) utilized a compound measure of enacted social support, rather than a measure of perceived support. They found that lower socioeconomic women who experienced high levels of stress during pregnancy, but who had high levels of enacted support, delivered babies of higher birth weight than women with low levels of enacted support.

Unlike previous studies, Barrera (1981) investigated the buffering effects of enacted support with pregnant adolescents. Their measure of enacted support asked respondents to rate how often they received various supportive transactions over the past month. In their cross-sectional study, they found that enacted support was positively associated with anxiety and depression; higher levels of received support were associated with higher levels of anxiety and depression during pregnancy. Further, enacted support did not buffer the effects of stress on psychological or obstetrical measures.

Similarly, Boyce et al. (1985) utilized unmarried adolescents as subjects in a cross-sectional study. They included objective measures of social support, recording the number of network members who provided either tangible support or emotional support, as well as measures assessing

the adequacy of support from the baby's father, and from family/friends. They found that as negative life events occurring over the preceding 4 month period increased, the number of people who provided emotional support also increased. In addition, adequate levels of support from the baby's father, and from family/friends were associated with fewer negative life events occurring in the previous 4 months. None of the measures of social support, however, buffered the effects of life stress on maternal or neonatal complications.

In a more sophisticated study, Turner et al. (1990) examined the influence of perceived social support from the teenager's family, friends, and the baby's father, on birth weight and depressive symptomatology among pregnant adolescents. The adolescents completed all measures early in their pregnancy. They found that higher levels of perceived support from family, friends, and partners were associated with lower levels of depressive symptomatology. After controlling for gestational age, only perceived support from the teenager's family was significantly related to birth weight: higher levels of perceived family support were associated with higher birth weights. When the interaction between life stress and perceived family support was included to investigate the buffering potential of social support, they found that social support did not moderated the effects of life stress on birth weight.

Turner et al. concluded that family support was predictive of more favorable outcomes regardless of level of life stress.

In summary, Norbeck and Tilden (1983) and Collins et al. (1993) found that perceived tangible support and enacted social support buffered the effects of stress on pregnancy outcomes where as Barrera (1981), Berkowitz and Kasl (1983), Boyce et al. (1983), Norbeck and Anderson (1989), Smilkstein et al. (1984), Pagel et al. (1990), and Turner et al. (1990) did not find evidence showing that type or source of social support, assessed from either an enacted support or a perceived support perspective, moderated the effects of life stress on obstetrical outcomes.

Discrepancies among these studies may be due to methodological shortcomings such as small sample size (e.g., Boyce et al., 1983), high attrition rate (e.g., Nuckolls et al., 1972; Collins et al. 1993), retrospective research design (e.g., Berkowitz & Kasl, 1983), and inappropriate statistical analyses (e.g., Norbeck & Tilden, 1983), and different measures employed to measure social support. Further, operationalization of social support was problematic in many of these studies. Some researchers employed social support measures of unknown or inadequate psychometric properties (e.g., Berkowitz & Kasl, 1983; Collins et al. 1993; Nuckolls et al., 1972; Pagel et al., 1990; Smilkstein et al., 1984). Also, differentiation among

the different types of support was problematic. For example, the measure of social support included by Norbeck and Tilden (1983) did not satisfactorily discriminate emotional from instrumental support.

Many of these studies (e.g., Barrera, 1981; Boyce et al., 1985; Norbeck & Tilden, 1983; Nuckolls et al., 1972; Pagel et al., 1990; Smilkstein et al., 1984) were also cross-sectional in design, and therefore, cannot distinguish between two important rival hypotheses: whether social support is influenced by pre-existing psychological symptoms, or social support affects psychological well-being (Schonfeld, 1991).

Moreover, the life event measures used in these studies may be confounded with social support measures (Thoits, 1982). Specifically, some events classified as "stressful," such as death of a spouse, family member, or friend, separation, divorce, or change in working or living locations, for example, also directly or indirectly reflect changes in level of support (Depner et al., 1984). Each of these stressful events may deprive the individual of various functional supports that were previously available. These events, therefore, can be classified as a stressful life event, and can be indicators of changes in social support (Thoits, 1982). In fact, in some of these studies, the life-events measures were significantly related to the social support measures. In effect, life event measures may

be measuring, to a large extent, the same thing as the social support measures: specifically, changes in social relationships (Cohen & Wills, 1985).

With respect to obstetrical outcomes, many researchers (e.g., Boyce et al., 1985; Norbeck & Tilden, 1983; Nuckolls et al., 1977; Smilkstein et al., 1984) simply recorded the occurrence of antepartum, intrapartum, and neonatal complications with little or no regard to their significance. Dichotomizing outcome measures into normal and complicated pregnancies does not allow one to examine whether specific indices of pregnancy outcomes are more sensitive to the effects of stress and support, and therefore important information may be inadvertently omitted.

These methodological and psychometric problems, therefore, may account for some of the inconsistent findings regarding the moderating effects of social support on maternal stress and pregnancy complications. Vaux (1988) correctly states that the results of these studies, owing to their inherent flaws, do not provide strong evidence for the buffering hypothesis, nor do they refute it. Thus, the buffering effects of social support remain unclear.

Directions for Further Research

Aside from the methodological and conceptual issues
that need to be clarified, several related issues need to be
considered. The impact of different sources of social
support on pregnancy outcome merits further investigation.
A review of the literature reveals a paucity of systematic
research in this area. For example, Molfese and her
colleagues (1987a, b) found that perceived support from
individual sources such as spouse, family and friends were
not strongly associated with maternal distress and pregnancy
complications. The validity of these findings, however, is
questionable due to the shortcomings of the research as
noted earlier. Related research examining the relationship
between support and maternal distress (i.e., anxiety and
depression) reveals that spousal support is crucial. Moss
et al. (1986), Norbeck and Tilden (1983), O'Hara, Rehm, and
Campbell (1983) and Tilden (1984) found a negative
relationship between spousal support and maternal distress,
typically anxiety, or depression, or both. Moreover, O'Hara
et al. (1983) reported "social support from one's spouse or
partner, and to a lesser degree from friends and family, was
related to whether a woman experienced depression following
childbirth." Likewise, Lieberman (1982) believes that the
spouse is a woman's key confidant during pregnancy and that
social support from family and friends is not a viable
substitute in the absence of spousal support. Given these

findings, it seems reasonable to believe that support from one's spouse or partner during pregnancy also may be more important than support from family and friends in moderating the relationship between (1) maternal distress and (2) pregnancy outcome. This proposition requires further systematic investigation.

Chapter 3

THE PRESENT STUDY

The present study examined the role of social support
and stress on (a) maternal distress (i.e., anxiety and
depression) and (b) pregnancy outcomes. Unlike past
research, this study employed a measure of "perceived
stress," rather than a life events schedule that combined
objective and subjective measures of stressors. Perceived
stress refers to the degree or extent to which one's current
life situation is appraised to be unpredictable,
uncontrollable, and overwhelming (Cohen et al., 1983).
Measures of perceived stress, unlike measures of stressful
life events, are not tied to the occurrence of specific
stressors, nor to the number of stressors that have occurred
over the past 6 to 12 months. Measures of perceived stress,
such as the Perceived Stress Scale devised by Cohen et al.
(1983), have been found to be moderately correlated with the
number of stressful life events occurring over the past
year, and with the subjective impact of stressful life
events occurring over the past year. The assessment of
"perceived stress" circumvents many of the problems that are
associated with life events measures, and, therefore, may
provide a more accurate indication of the effect that
maternal stress has on pregnancy outcomes. At the present

time, measures of perceived stress have not been employed in obstetrical research.

Second, the sources of social support (i.e., support from spouse or partner, family and friends) are also examined. Unlike previous studies, the current one will include only women who are married, or involved in a stable common-law relationship. This requirement will allow the examination of the effects that different sources of support may have on stress and outcome measures.

Third, intrapartum and neonatal biomedical outcomes that can be objectively measured are used. This avoids criticisms encountered by previous research whereby complications of varying severity were recorded simply as "complications" with little or no regard to their significance. In addition, the current study controls for parity and antepartum biomedical risk factors, both of which have been shown to be associated with obstetrical outcomes.

The first part of this study constitutes a replication of past research, the purpose of which is to eliminate many of the methodological and conceptual problems previously discussed. Based on the findings of past research, the following hypotheses will be tested:

1. Perceived stress will be positively associated with maternal distress in both the first and second half of pregnancy; as perceived

stress increases, state anxiety and depression
increase.

2. Perceived support from (i) spouse, (ii)
   family members, and (iii) friends will be
   negatively related to perceived stress during the
   first and the second half of pregnancy; as
   perceived support from each source increases,
   level of perceived stress decreases during the
   first and second half of pregnancy.

3. Perceived support from (i) spouse, (ii) family
   members, and (iii) friends will be negatively
   associated with maternal distress (i.e., state
   anxiety and depression) during the first and
   second half of pregnancy; as perceived support
   from each source increases, state anxiety and
   depression will decrease in the first and second
   half of pregnancy.

With respect to the buffering hypothesis, the following
hypotheses will be tested:

1. Social support will buffer the effects of
   perceived stress on maternal distress.
   Specifically, it is predicted that under high
   levels of perceived stress, women with low levels
   of support will experience higher levels of
   maternal distress than women with high levels of

support. Under low levels of stress, support will have little effect on maternal distress.

2. Social support will buffer the effects of stress on antepartum, intrapartum, and neonatal complications and outcomes. Specifically, under high levels of stress, women with high levels of support will experience fewer antepartum, intrapartum, and neonatal complications than women with low levels of support. Likewise, under high levels of stress, women with higher levels of support during pregnancy will have longer gestational periods than women with lower levels of support. Similarly, under high levels of stress, women with higher levels of support will have shorter stage 1 and stage 2 labor periods than women with low levels of support. Finally, under high levels of stress, the newborns of women with high levels of support during pregnancy will have (i) higher birth weights, (ii) higher Apgar Scores at 5 minutes, and (iii) shorter latencies to sustain respiration than the newborns of mothers who had low levels of support during pregnancy.

This study also examines the relationship between source of support, stress, maternal distress, and pregnancy complications. The following hypotheses will be tested:

1. Social support from one's spouse will more
    effectively buffer the effects of perceived stress
    on maternal distress (i.e., state anxiety and
    depression) than support from family and friends.

2. Social support from one's spouse will more
    effectively buffer the effects of perceived stress
    on intrapartum and neonatal outcomes than support
    from family and friends.

The final purpose of this study is more exploratory in
nature. The relationship between sources of support,
perceived stress, maternal distress, intrapartum outcomes,
and neonatal outcomes will be examined.

Chapter 4

METHOD

Subject Selection

Women were recruited to participate in this study from the offices of two local obstetricians. To be included in the study, the women had to meet the following criteria:

1. They were 20 years of age or older.

2. Their relationship with their spouse, or partner, was stable.

3. The initial assessment was completed prior to 20 weeks gestation.

4. They had sufficient fluency in verbal and written English to understand the nature of the study, to provide informed consent, and to complete the questionnaires.

5. The pregnancy was considered to be low risk by the obstetrician. Their medical history was free from medical conditions such as diabetes, cardiac disease, hypertension, or renal disease, complications that would contribute to high risk pregnancies. Further, their medical history was free from surgical conditions that also would contribute to high risk pregnancies.

6. Their personal history was free from psychological conditions, such as depression, for example, that could be exacerbated during pregnancy.

7. Their current health status was free from severe maternal malnourishment or drug abuse.

The following exclusion criterion was also

adopted:

1.   Women who were expecting multiple births
      (i.e, twins, for example) were excluded
      from the study.

Subjects

One hundred-and-fifty pregnant women, identified by the

obstetricians as appropriate for the study, were asked to

participate. The nature of the study was explained, as well

as the time requirements needed to complete the various

questionnaires. Six of the women declined to participate in

the study at this point. Of the remaining 142 women, 104

women completed all phases of the study. Total attrition

was 27% (n=38): 2% miscarried (n=3), 3.5% changed doctors or

moved out of the area (n=5), 1.5% withdrew from the study

(n=2), and 20% completed some, but not all, parts of the

study (n=28). In the groups of women who withdrew from the

study, or only completed parts but not all of the

questionnaires, most indicated that they did not have the

time necessary to complete the questionnaires. In addition,

4 of these 28 women separated from their spouse or partner

before delivery so information concerning spousal support

was missing. Finally, the data from one woman who completed

the study was eliminated due to extreme scores on most

measures. The final sample consisted of 103 women.

The average age of the women at the beginning of the study was 31.95 years (SD=4.57, range=21-44 years). Ninety-nine of the women were married, and four were living common-law. The women were largely well-educated: 58% of them had completed, or were currently enrolled in, college or university. In contrast, 30% of the women had completed part or all of high-school only, and the remaining 12% had completed some form of specialized training program. Seventy-three percent of the women were employed at the beginning of the study, and 95% of those were also employed during the second half of their pregnancy. In addition, 98% of the spouses/partners were employed at the beginning of the study. Sixty-three percent of the women reported their annual family income to be over $40,000, 20% indicated their annual family income to be between $30,000 and $40,000, and 17% stated their annual family income to be $30,000 or less.

Table 1 summarizes information on various health variables. Most of the women appeared to be maintaining a healthy lifestyle. During the first half of pregnancy, 12% of the women were smoking daily, 61% were consuming caffeinated beverages daily, and 3% were consuming alcohol weekly. By the second half of pregnancy, 6% of the women were consuming a small amount of alcohol through the week, whereas smoking behaviour and caffeine consumption remained relatively unchanged.

Table 1: Descriptive statistics for health variables

	First Half of Pregnancy				Second Half of Pregnancy			
Smoking								
no	n=91				no	n=92			
yes	n=12	Mean	SD	Range	yes	n=11	Mean	SD	Range
	no./day	10.58	5.52	3-20		no./day	8.82	6.85	1-20
Alcohol Consumption								
no	n=101				no	n=97			
yes	n=2	Mean	SD	Range	yes	n=6	Mean	SD	Range
	ml abs alc/wk	48.30	24.60	34.10-76.71		ml abs alc/wk	29.79	18.30	4.26-59.66
Caffeine Consumption								
no	n=41				no	n=35			
yes	n=62	Mean	SD	Range	yes	n=70	Mean	SD	Range
	no. of cups/day	2.21	1.68	1-10		no. of cups/day	2.07	1.31	1-6

ml abs alc = milliliters of absolute alcohol

Forty-five per cent of the women were primipara (i.e.,

para I), 38% were secundipara (i.e., *para II*), 14% were

tripara (i.e., *para III*), and 3% were quadrapara (i.e., *para

IV*). Overall, 55% of the women were multipara (i.e., having

had one or more pregnancies that have gone beyond 20 weeks

gestation).

Measures

Psychosocial Variables

Perceived Stress

The Perceived Stress Scale (PSS; Cohen et al., 1983)

was used to assess levels of maternal stress (see Appendix

A). The PSS is a 14 item self-report questionnaire designed

to measure the degree to which respondents perceive their

lives to be unpredictable, uncontrollable, and overwhelming

over the past month. Respondents rate each item on a

5-point Likert-type scale, ranging from 0 (Never) to 4 (Very

Often). Items 4, 5, 6, 7, 9, 10, and 13 are scored in

reverse order. Possible scores range from 0 to 56, with

higher scores reflecting higher levels of perceived stress.

Coefficient alpha reliability for the PSS ranges from 0.84

to 0.86 (Cohen et al., 1983).

Perceived Social Support

Three measures of perceived social support were used. The first two measures, perceived social support from family (PSS-Fa) and perceived social support from friends (PSS-Fr), were developed by Procidano and Heller (1983), and include items concerned with the provision primarily of emotional support by way of behavioural acts as perceived by the recipients (see Appendix B). The PSS-Fa and PSS-Fr are self-report measures each consisting of 20 items, with "Yes," "No," "Don't Know" response options. The original measures possess high internal consistency with Cronbach's alpha of 0.90 and 0.88 for PSS-Fa and PSS-Fr respectively. Further, separate factor analyses with orthogonal factor rotation indicated that each scale is composed of a single factor (Procidano & Heller, 1983).

Subsequent research by Sarason, Shearin, Pierce, and Sarason (1987) showed that the yes-no format "leads quickly to ceiling effects in groups high in social support, as well as with problems with homogeneity of variance" (p. 825). To circumvent these problems, the PSS-Fa and PSS-Fr were revised to use a 5-point Likert-type scale, ranging from Strongly Disagree to Strongly Agree.

The third measure, perceived social support from spouse (PSS-Sp), was developed for this study, and consisted of 20 items that paralleled those contained in the PSS-Fa.

Possible scores on each scale range from 20 to 100, with high scores representing high levels of perceived social support from spouse, family, and friends.

Given the revisions of the PSS-Fa, PSS-Fr, and PSS-Sp measures, the Multidimensional Scale of Perceived Social Support (MSPSS) developed by Zimet et al. (1988) was included (see Appendix C). This is a 12 item self-report measure in which respondents rate each item on a 7-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree." There are three factor-analytically derived subscale scores assessing perceived social support from a "special person" (MSPSS-Sp), from family (MSPSS-Fa), and from friends (MSPSS-Fr). For the purposes of this study, subjects were informed to consider their spouse/partner as their special person. Internal reliability for the significant other, family, and friends subscales on the initial version of this measure was 0.91, 0.87, and 0.85, respectively. Further, it has adequate stability over a 2-3 month period. Like the PSS, high scores on the MSPSS reflect higher levels of perceived social support.

During the first assessment period, prior to 20 weeks gestation, the women were instructed to rate the support they received from each source since they first became pregnant. During the second half of the pregnancy, after 32 weeks gestation, the women were instructed to rate the

support they received from each of the three sources over the past month of their pregnancy.

Satisfaction with Support

This questionnaire was designed to assess satisfaction with support from spouse/partner, family, and friends, during the first half and the second half of pregnancy. On a 5-point Likert-type scale ranging from "Strongly Disagree" to "Strongly Agree," the women rated how satisfied they were with the support they received from spouse/partner, family, and friends during the past month of their pregnancy. A higher score reflected greater satisfaction with the support obtained from that source.

Type of Support Most Useful

Prior to 20 weeks gestations, after 32 weeks gestation, and then again 2 to 8 weeks postpartum, the women were asked to indicate which type of support, emotional, practical, or informational, they found most useful (see Appendix D). Emotional support was defined as "a shoulder to lean on, or support you find comforting or soothing when you are upset." Practical support was defined as "assistance provided in completing tasks, such as helping with daily housework, looking after the kids, or running errands, for example."

Informational support was defined as "the provision of important or useful information, or helpful suggestions, for example."

Type and Source of Support Most Useful Throughout Pregnancy

In this section, the women identified whose emotional support, practical support, and informational support they found most useful throughout their pregnancy. Subsequent to this, the women were asked to describe why the emotional support, practical support, and informational support from that individual was most useful to them (see Appendix E).

Maternal Distress

Measures of state anxiety and depression were used to assess maternal distress.

Anxiety

The Spielberger State-Trait Anxiety Inventory (STAI) is a 20 item self-report instrument measuring state anxiety (Spielberger, Gorsuch, & Lushene, 1970). Each item is rated on a 4-point Likert-type scale. Possible scores on this scale range from 20 to 80, with higher scores reflecting higher levels of state anxiety.

Depression

The revised version of the Beck Depression Inventory (BDI-R) is a 21-item self-report scale that measures the behavioural manifestations of depression irrespective of clinical diagnosis (Beck, Rush, Shaw, & Emery, 1979). Each item lists 4 statements and respondents select the statement that best describes the way they feel "over the past week, including today." The scores range from 0 to 63; scores from 0 to 9 are considered to fall within the normal range or asymptomatic; scores from 10 to 18 reflect mild to moderate depression; scores from 19 to 29 are indicative of moderate to severe depression; and scores over 30 indicate extremely severe depression (Beck & Steer, 1987, p. 7). The BDI-R has high internal consistency when used with a nonpsychiatric population, with a Cronbach's coefficient alpha of 0.81 (Beck, Steer, & Garbin, 1988).

Obstetrical Measures

Antepartum Fetal Risk Assessment

Risk of antepartum complications was assessed using a risk screening scale devised by Goodwin, Dunne, and Thomas (1969). It is a scoring technique used by the obstetrician

to identify and rate antepartum fetal risk factors. The
score consists of three categories: pre-pregnancy data,
conditions developing during the present pregnancy before
the onset of labour, and the gestational age attained at the
time of scoring (Goodwin et al., 1969, p. 57). From this
information, a cumulative fetal risk score is calculated by
summing the scores from each of the three categories, where
a score of 0-1 represents the lowest potential for risk for
the fetus, a score of 2-3 reflects a moderate potential for
risk, and a score of 4-10 reflects the highest potential for
risk (see Appendix F).

Pregnancy Outcomes

The following obstetrical outcomes were recorded:
gestational age, duration of stage 1 labour, duration of
stage 2 labour, birth weight, Apgar score at 5 minutes, and
time for the newborn to sustain respiration (see Appendix
G).

The following antepartum, intrapartum, and neonatal
complications were recorded for each woman over the course
of her pregnancy.

Antepartum Complications
1.   Preterm delivery prior to the 37th completed week
     of gestation.

Intrapartum Complications

    1.   Systolic blood pressure over 140mm or diastolic blood pressure over 90mm on two occasions at least 6 hours apart during the labour or the postpartum period.

    2.   Prolonged labour in absence of cephalopelvic disproportion:

        (a) Primiparas with first stage longer than 22.9 hours or second stage longer than 105 minutes.

        (b) Multiparas with first stage longer than 13.1 hours or second stage longer than 32 minutes.

    3.   Delivered by cesarean section, midforceps, or vacuum in absence of absolute cephalopelvic disproportion.

Each intrapartum complication that occurred was recorded and summed to produce an index of the total number of intrapartum complications.

Neonatal Complications

    1.   Apgar rating[1] at 5 minutes less than 7.

    2.   Time to sustain respiration greater than 89 seconds.

    3.   Admission to intensive care nursery.

    4.   Birth weight less than 2,500 grams.

    5.   Stillborn, or neonatal death within first 2 weeks.

    6.   Abnormalities of the baby.

---

[1]Following delivery, infants are rated on heart rate, respiratory effort, muscle tone, reflex irritability, and skin colour. Each criterion is rated from 0 (worst) to 2 (best), and the sum of these ratings form the Apgar score (Collins et al., 1993, p. 1248).

Each neonatal complication that occurred was recorded and summed to create an index of the total number of neonatal complications.

The number of antepartum, intrapartum, and neonatal complications that occurred were summed to form a final measure, the total number of pregnancy complications.

Procedure

Prior to the 20th week gestation, and then again in the second half of pregnancy (after 32 weeks gestation), women completed the self-report questionnaires as shown in Table 2. A sample questionnaire package is provided in Appendix H. The obstetricians completed the antepartum fetal risk screening scale for each woman for the first half and the second half of pregnancy, and recorded antepartum, intrapartum, and neonatal outcomes and complications. Follow-up questionnaires were mailed to the women following delivery; they were asked to complete the questionnaires and return them by mail.

Table 2: Timetable of forms and self-report measures
administered to subjects

Initial Assessment (prior to 20 weeks gestation)

1. Consent form

2. Demographics questionnaire

3. Perceptions of Stress (PSS) questionnaire

4. Perceived Social Support questionnaires

    a. Support from spouse (PSS-Sp and MSPSS-Sp)

    b. Support from family (PSS-Fa and MSPSS-Fa)

    c. Support from friends (PSS-Fr and MSPSS-Fr)

5. Satisfaction with support received

6. State Anxiety Inventory (STAI)

7. Revised Beck Depression Inventory (BDI-R)

Assessment During the Second Half of Pregnancy (after 32
weeks gestation)

1. Perceptions of Stress questionnaire

2. Perceived Social Support questionnaires

    a. Support from spouse (PSS-Sp and MSPSS-Sp)

    b. Support from family (PSS-Fa and MSPSS-Fa)

    c. Support from friends (PSS-Fr and MSPSS-Fr)

3. Satisfaction with support received

4. State Anxiety Inventory (STAI)

5. Revised Beck Depression Inventory (BDI-R)

Postpartum (2 to 8 weeks following delivery)

1. Type of Support, and source of support, most useful
    throughout pregnancy.

Chapter 5

RESULTS

Subject Attrition

Due to the high attrition rate (i.e., 27%), complete and incomplete data sets were compared on demographic variables to determine whether those who did not complete the study (n=27) varied in any significant way from those who did complete the study (n=103). The women were compared on the following variables: age, parity, education, income, and the psychosocial measures. Because of the large number of comparisons to be made, differences between the group means were first tested using Hotelling's T^2. Results of Hotelling's T^2 indicated that there were no significant differences between the women who completed the study and those who did not on any of the demographic variables or psychosocial measures (T^2= 6.9084, F(13,117)=0.4820, p=.9309). The results of the univariate, independent t tests comparing the group means were also nonsignificant. (See Table 3).

Table 3: Descriptive statistics and t tests of demographic variables and psychosocial measures comparing subjects who completed the study with those who did not (N=130)

	Completed Data Sets (n=103)		Incomplete Data Sets (n=27)			
	Mean	SD	Mean	SD		
age	35.95	4.57	33.30	4.62	$t(128)=-1.36$, p=.1769	ns
education	2.36	1.05	2.04	1.06	$t(128)= 1.42$, p=.1576	ns
family income	4.38	1.00	4.52	0.85	$t(128)= 1.22$, p=.2237	ns
parity	0.80	0.86	1.07	1.02	$t(128)=-1.45$, p=.1499	ns
PSS-Sp	82.76	12.72	82.15	14.44	$t(128)= 0.22$, p=.8299	ns
MSPSS-Sp	24.98	4.46	24.56	5.75	$t(128)= 0.41$, p=.6797	ns
PSS-Fa	74.63	16.49	76.65	18.58	$t(127)=-0.54$, p=.5870	ns
MSPSS-Fa	21.55	5.51	21.85	5.07	$t(128)=-0.25$, p=.7995	ns
PSS-Fr	78.02	11.31	78.31	12.48	$t(127)=-0.11$, p=.9096	ns
MSPSS-Fr	22.55	4.20	22.41	4.40	$t(128)= 0.16$, p=.8737	ns
Perceived Stress	22.56	8.48	22.44	8.47	$t(128)= 0.06$, p=.9485	ns
State Anxiety	36.53	12.24	36.59	13.06	$t(128)=-0.02$, p=.9826	ns
Depression	7.82	5.56	7.67	6.45	$t(128)= 0.13$, p=.8988	ns

Psychosocial Measures

The initial assessment occurred, on average, during the 15th week of pregnancy (Mean=15.03; $\underline{SD}$=3.82; Range=6-20) and the second assessment occurred in the third trimester, approximately during the 33rd week of pregnancy (Mean=33.54, $\underline{SD}$=2.09, Range=26-39).

Descriptive statistics for the psychosocial variables measured in the first and the second half of pregnancy are summarized in Table 4. Because multiple measures of stress, support, anxiety, and depression were used, differences between mean scores in the first and second half of pregnancy were evaluated using Hotelling's $\underline{T}^2$. Results of Hotelling's $\underline{T}^2$ revealed there to be significant differences between means ($\underline{T}^2$=32.7519, $\underline{F}$(9,94)=3.3537, $\underline{p}$=.01). The results of univariate, matched $\underline{t}$ tests comparing mean scores from the first and the second half of pregnancy are summarized in Table 4. To control for the familywise error rate, the significance levels for each comparison was set at *alpha*=.006.

Perceived Stress

The mean level of perceived stress remained largely unchanged from the first half of pregnancy to the second

Table 4: Descriptive statistics and t tests of psychological measures completed in the first half and second half of pregnancy (n=103)

Measures	First Half of Pregnancy			Second Half of Pregnancy			
	Mean	SD	Range	Mean	SD	Range	
Perceived Stress	22.56	8.48	3-46	22.51	8.84	4-44	t(102)= 0.06, p=.9547 ns
Spouse Support							
PSS-Sp	82.76	12.72	33-100	80.56	13.35	23-99	t(102)= 2.71, p=.0079 ns
MSPSS-Sp	24.98	4.46	4-28	24.74	3.84	4-28	t(102)= 0.78, p=.4380 ns
Family Support							
PSS-Fa	74.66	16.45	20-100	71.71	14.76	26-96	t(102)= 3.72, p=.0003
MSPSS-Fa	21.55	5.51	4-28	20.84	5.13	4-28	t(102)= 1.84, p=.0689 ns
Friend Support							
PSS-Fr	78.02	11.31	48-98	75.15	10.44	45-96	t(102)= 4.18, p=.0001
MSPSS-Fr	22.55	4.20	8-28	22.00	3.95	7-28	t(102)= 1.95, p=.0538 ns
Mood States							
State Anxiety	36.53	12.24	20-79	36.57	10.31	20-63	t(102)=-0.03, p=.9750 ns
Depression	7.83	5.56	0-32	8.28	5.28	1-28	t(102)=-0.86, p=.3915 ns

half of pregnancy. Overall, the mean scores indicate that the women believed themselves to be experiencing a moderate degree of stress at the time of assessment.

Perceived Support

Briefly, two different sets of measures, PSS and MSPSS, were used to assess perceived support from spouse, family, and friends. Overall, perceived levels of support from spouse, family, and friends during the first half and the second half of pregnancy were uniformly high, indicating that the women felt well supported. Summary statistics from the Perceived Social Support from Family (PSS-Fa) and from Friends (PSS-Fr) measures designed by Procidano and Heller (1981) as well as from the parallel measure of Perceived Social Support from Spouse (PSS-Sp) designed for this study will be reported first. Subsequently, results from the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988), assessing support from spouse (MSPSS-Sp), family (MSPSS-Fa), and friends (MSPSS-Fr) will be reported.

From the first half of pregnancy to the second half, there were slight, though significant, decreases in the mean levels of perceived support from family ($\underline{t}(102)=3.67$, $\underline{p}=.0004$), and friends ($\underline{t}(102)=4.18$, $\underline{p}=.0001$; see Table 4). Overall, perceived support from one's spouse did not change

significantly from the first half of pregnancy to the second half.

The aforementioned pattern of perceived support was also found when support was assessed by the MSPSS (Zimet et al., 1988). Perceived levels of support from spouse, family and friends decreased slightly, though not significantly, from early to late pregnancy.

Levels of support from various sources in the first half and in the second half of pregnancy were subsequently compared. Because of the number of comparisons involved, differences between mean scores were first evaluated using Hotelling's T^2. Hotelling's T^2 analysis was significant (T^2=62.407, F(8,95)=7.266, p<.0005), indicating significant differences exist among the various sources of support. With significance levels for each comparison set at *alpha*=.004 to control for the familywise error rate, follow-up univariate t tests revealed significant mean differences on 8 of the 12 comparisons (see Table 5). The perceived level of support from one's spouse, as measured by PSS-Sp and MSPSS-Sp, was significantly higher, on average, than the perceived level of support from family members and from friends in the first half and in the second half of pregnancy. Support from friends was slightly, though not significantly, higher than the perceived level of support from family members in both the first half and second half of pregnancy.

Table 5: Matched t tests comparing different sources of support during the first half and the second half of pregnancy ($\underline{df}$=102)

	$\underline{t}$	
First Half of Pregnancy		
PSS-Sp vs PSS-Fm	4.40	$\underline{p}$<.00005
PSS-Sp vs PSS-Fr	3.33	$\underline{p}$=.0012
PSS-Fm vs PSS-Fr	-1.80	$\underline{p}$=.0743 ns.
MSPSS-Sp vs MSPSS-Fm	5.77	$\underline{p}$<.00005
MSPSS-Sp vs MSPSS-Fr	4.95	$\underline{p}$<.00005
MSPSS-Fm vs MSPSS-Fr	-1.65	$\underline{p}$=.1021 ns.
Second Half of Pregnancy		
PSS-Sp vs PSS-Fm	5.37	$\underline{p}$<.00005
PSS-Sp vs PSS-Fr	3.43	$\underline{p}$=.0009
PSS-Fm vs PSS-Fr	-2.00	$\underline{p}$=.0484 ns.
MSPSS-Sp vs MSPSS-Fm	6.86	$\underline{p}$<.00005
MSPSS-Sp vs MSPSS-Fr	5.55	$\underline{p}$<.00005
MSPSS-Fm vs MSPSS-Fr	-2.04	$\underline{p}$=.0437 ns

alpha=.005

Maternal Mood State

State anxiety, measured by the STAI, and depression, assessed by the revised BDI, were relatively low in both the first half and second half of pregnancy (see Table 4), indicating that the women were experiencing little in the way of distress as assessed by these measures. In addition, most women fell within the normal range on the revised BDI; during the first half of pregnancy, 67% (n=69) scored in the asymptomatic range, 29% (n=30) scored in the mildly depressed range, 3% (n=3) scored in the moderately depressed range, and 1% (n=1) scored in the severely depressed range. By the second half of pregnancy, 66% obtained scores in the asymptomatic range, 30% (n=31) scored in the mildly depressed range, and 4% (n=4) scored in the moderately depressed range. Neither depression levels nor state anxiety levels changed significantly from the first half to the second half of pregnancy (see Table 4).

Zero-order correlations

Zero-order correlations between the demographic variables and psychosocial measures completed in the first half and in the second half of pregnancy were largely weak, and nonsignificant (see Appendix I).

Zero-order correlations between psychosocial measures completed in the first half and the second half of pregnancy are shown in Tables 6, 7, and 8. Because of the large number of correlations, significance levels were set at *alpha*=.0006 to control for the familywise error rate. In Table 6, the values in the diagonal represent test-retest correlations for the psychosocial measures completed in the first half and second half of pregnancy. All test-retest coefficients were significant. It can be seen that levels of support from spouse, family, and friends remained stable from early to late pregnancy, with test-retest correlations ranging from a low of 0.72 for perceived spousal support, as measured by MSPSS-Sp, to a high of 0.87 for perceived family support, as assessed by PSS-Fa. Levels of perceived stress, state anxiety, and depression, on the other hand, remained less stable over the same period, as reflected by the lower test-retest correlations for these measures.

Measures of support from spouse, family, and friends, assessed by the PSS and MSPSS, completed in the first half of pregnancy were positively, and significantly, correlated with their respective counterpart measures in both the first and the second half of pregnancy.

As would be expected, higher levels of perceived stress, state anxiety, and depressive symptomatology in the first half of pregnancy were significantly related to higher levels of perceived stress, state anxiety, and depressive

Table 6: Zero-order correlations between psychosocial measures completed in the first half and second half of pregnancy (df=101)

Second Half of Pregnancy

		PSS-Sp	MSPSS-Sp	PSS-Fa	MSPSS-Fa	PSS-Fr	MSPSS-Fr	Perceived Stress	State Anxiety	Depression
First Half of Pregnancy	PSS-Sp	0.80**	0.74**	0.17	0.18	0.08	0.14	-0.20	-0.13	-0.08
	MSPSS-Sp	0.71**	0.72**	0.12	0.14	0.10	0.21	-0.20	-0.10	-0.08
	PSS-Fa	0.29	0.15	0.87**	0.74**	-0.03	0.02	-0.29	-0.26	-0.25
	MSPSS-Fa	0.30	0.18	0.79**	0.73**	0.07	0.17	-0.30	-0.19	-0.26
	PSS-Fr	0.20	0.20	0.16	0.10	0.80**	0.71**	-0.16	-0.14	-0.09
	MSPSS-Fr	0.22	0.25	0.09	0.11	0.71**	0.75**	-0.20	-0.14	-0.14
	Stress	-0.24	-0.21	-0.19	-0.06	-0.15	-0.18	0.50**	0.38*	0.41**
	Anxiety	-0.35**	-0.42**	-0.13	-0.08	-0.16	-0.20	0.33*	0.39**	0.32*
	Depression	-0.29	-0.36*	-0.15	-0.10	-0.26	-0.19	0.34*	0.42**	0.51**

The diagonal coefficients are test-retest values. Above and below the diagonal are the intercorrelations between the psychosocial measures completed in the first and second half of pregnancy.

* $p < 0.0006$
** $p < 0.00005$

symptoms in the second half of pregnancy.

State anxiety in early pregnancy was also negatively, and significantly, correlated with spousal support in late pregnancy (see Table 6). This suggests that higher levels of state anxiety in the first half of pregnancy are associated with lower levels of spousal support in the second half of pregnancy. Likewise, depressive symptomatology in the first half of pregnancy was negatively, and significantly, related to spousal support, assessed by MSPSS-Sp, in the second half of pregnancy. Again, this suggests that higher levels of maternal depression in early pregnancy are associated with lower levels of spousal support in late pregnancy.

Zero-order correlations among psychosocial variables in the first half of pregnancy, and among psychosocial variables in the second half of pregnancy are presented in Tables 7 and 8 respectively. It was hypothesized that perceived stress would be positively related to maternal distress (i.e., state anxiety and depression) in both the first and second half of pregnancy. Significance levels were set at $alpha=.025$ to control for the familywise error rate. From Tables 7 and 8, it can be seen that correlations were in the expected direction; in both assessment periods, increasing levels of perceived stress were accompanied by significantly higher levels of state anxiety and depression.

These results support the hypothesis regarding the relationship between perceived stress, state anxiety, and depression.

State anxiety levels in early and late pregnancy were also positively, and significantly, correlated with depressive symptomatology in the first and second half of pregnancy. Thus, increasing levels of state anxiety are accompanied by increasing levels of behavioural manifestations of depression.

It was also hypothesized that perceived support from spouse, family and friends would be negatively associated with perceived stress, state anxiety, and depressive symptomatology in the first and second half of pregnancy. Given the number of correlations, the significance level was set at *alpha*=0.008 to control for the family wise error rate. As can be seen in Tables 7 and 8, perceived support from one's spouse (measured by PSS-Sp and MSPSS-Sp), family members (assessed by PSS-Fa and MSPSS-Fa), and friends (assessed by PSS-Fr and MSPSS-Fr) were all negatively correlated with perceived stress, state anxiety, and depression during both the first and second half of pregnancy. Despite the strong relationships among these measures, only a few of them were statistically significant. In the first half of pregnancy, perceived spousal support (MSPSS-Sp), and perceived family support (MSPSS-Fa) were negatively, and significantly, correlated with perceived

Table 7: Zero-order correlations among psychosocial measures completed in the first half of pregnancy (df=101)

Measures	Stress 1.	PSS-Sp 2.	MSPSS-Sp 3.	PSS-Fa 4.	MSPSS-Fa 5.	PSS-Fr 6.	MSPSS-Fr 7.	Anxiety 8.	Depression 9.
1. Perceived Stress	1.00								
Spouse Support									
2. PSS-Sp	-0.22	1.00							
3. MSPSS-Sp	0.28*	0.81**	1.00						
Family Support									
4. PSS-Fa	-0.19	0.20	0.13	1.00					
5. MSPSS-Fa	-0.26*	0.22	0.28	0.81**	1.00				
Friend Support									
6. PSS-Fr	-0.16	0.28	0.28	0.11	0.18	1.00			
7. MSPSS-Fr	-0.23	0.33	0.34*	0.02	0.22	0.82**	1.00		
Mood States									
8. State Anxiety	0.70**	-0.35*	-0.41**	-0.12	-0.17	-0.18	-0.23	1.00	
9. Depression	0.59**	-0.28*	-0.33*	-0.18	-0.20	-0.26*	-0.32*	0.65**	1.00

alpha=.008
* $p<.008$
** $p<0.00005$

Table 8: Zero-order correlations among psychosocial measures completed in the second half of pregnancy (df=101)

Measures	Stress 1.	PSS-Sp 2.	MSPSS-Sp 3.	PSS-Fa 4.	MSPSS-Fa 5.	PSS-Fr 6.	MSPSS-Fr 7.	Anxiety 8.	Depression 9.
1. Perceived Stress	1.00								
Spouse Support									
2. PSS-Sp	-0.35*	1.00							
3. MSPSS-Sp	-0.27*	0.87**	1.00						
Family Support									
4. PSS-Fa	-0.31*	0.29	0.18	1.00					
5. MSPSS-Fa	-0.37*	0.28	0.20	0.88**	1.00				
Friend Support									
6. PSS-Fr	-0.23	0.11	0.11	0.07	0.04	1.00			
7. MSPSS-Fr	-0.31*	0.17	0.17	0.14	0.22	0.78**	1.00		
Mood States									
8. State Anxiety	0.72**	-0.29*	-0.22	-0.25	-0.27*	-0.25	-0.28*	1.00	
9. Depression	0.63**	-0.23	-0.22	-0.28*	-0.26*	-0.21	-0.19	0.69**	1.00

alpha=.008
* p<.008
**p<0.00005

stress. In the second half of pregnancy, perceived spousal support (PSS-Sp and MSPSS-Sp), perceived family support, (PSS-Fa and MSPSS-Fa), as well as perceived friend support (MSPSS-Fr) were inversely, and significantly, correlated with perceived stress. Perceived spousal support (PSS-Sp and MSPSS-Sp) in the first half of pregnancy was significantly correlated with state anxiety. In the second half, perceived spousal support (PSS-Sp), perceived family support (MSPSS-Fa), and perceived friend support (MSPSS-Fr) were significantly, and inversely associated with maternal state anxiety. Perceived spousal support (PSS-Sp and MSPSS-Sp) and perceived friend support (PSS-Fr and MSPSS-Fr) in the first half of pregnancy were negatively, and significantly, correlated with manifestations of depressive behaviours in early pregnancy. In contrast, only perceived family support (PSS-Fa and MSPSS-Fa) in the second half of pregnancy was significantly correlated with depressive symptomatology during that same period.

These results provide limited evidence regarding the hypothesized relationships between perceived social support and perceived stress, state anxiety, and maternal depression. Specifically, higher levels of perceived spousal and family support, but not friend support, were associated with lower levels of perceived stress in the second half of pregnancy only. Furthermore, higher levels of perceived spousal and family support, but not friend

support, were associated with lower levels of state anxiety and depression in the first half of pregnancy only. Finally, higher levels of perceived family support was significantly related to lower levels of depressive symptoms in the second half of pregnancy.

The Buffering Effect of Support on Stress, State Anxiety, and Depression

To briefly reiterate, it was hypothesized that support would buffer the effects of perceived stress on anxiety and depression. That is, women under high levels of stress with low levels of support will experience higher levels of anxiety and depression than women with higher levels of support. The buffering effect of perceived support from spouse, family, and friends on perceived stress and (1) anxiety, and (2) depression, will be examined in the sections that follow.

The general strategy used to test the buffering predictions was as follows: the criterion variable, either state anxiety or depression assessed during the second half of pregnancy, was regressed on an initial set of predictors which included maternal age, education, and annual family income, as well as the baseline measure of maternal mood (state anxiety or depression) completed during the first half of pregnancy, perceived stress (PSS) measured in the

first and second half of pregnancy, and perceived support

from either spouse, family, or friends, assessed during both

the first and second half of pregnancy. This initial

regression analysis yielded a reference value of R^2.

Interaction terms were created by multiplying perceived

stress during the second half of pregnancy with each of the

six measures of support during the second half of pregnancy;

with spousal support, these interaction terms were PSS X

PSS-Sp and PSS X MSPSS-Sp: with support from family, PSS X

PSS-Fa and PSS X MSPSS-Fa: and with support from friends,

PSS X PSS-Fr and PSS X MSPSS-Fr. Subsequently, each

interaction term was included in the regression analysis and

a new R^2 was calculated. The difference between these two

R^2 values was used to determine whether the addition of the

interaction term accounted for a significant amount of

explained variance over and above that explained by the

initial set of predictors. A significant difference between

the obtained R^2 values indicates that the relationship

between the criterion variable, either state anxiety or

depression during the second half of pregnancy, and

perceived stress varies at different levels of perceived

support from different sources.

In order to provide a graphical representation of those

interactions which were significant, a cut score on the

support measure from the second half of pregnancy was

defined, as close to the median as possible, so that two

groups were created, a low-support group and a high-support group. For each group, the criterion measure was then regressed on the initial set of predictors, and the residual scores (i.e., difference scores between obtained and predicted criterion scores) from this analysis were subsequently regressed on the perceived stress scores obtained in the second half of pregnancy for the low-support and high-support groups to obtain two regression equations, one for the low-support group, and one for the high-support group. These regression equations were then used to plot the results graphically.

Effects of Perceived Support on Stress and Maternal Anxiety

In a series of multiple regression analyses, state anxiety in the second half of pregnancy was initially regressed on maternal age, education, family income, state anxiety in the first half of pregnancy, perceived stress and perceived support from spouse, family, and friends, assessed in the first and second half of pregnancy, and then on each of the six interaction terms. The results of each regression analysis revealed that none of the interaction terms accounted for a significant amount of variance over and above that explained by the initial set of predictors (see Appendix J). In other words, perceived support from

spouse, family, or friends did not significantly buffer the effect of perceived stress on maternal state anxiety.

Effects of Support on Stress and Maternal Depression

The regression of depressive symptomatology in the second half of pregnancy on maternal age, education level, and annual family income, as well as depressive symptomatology assessed during the first half of pregnancy, perceived stress and perceived support from family members (PSS-Fa) during both the first and second half of pregnancy produced an R^2 of .5494 (adjusted R^2=.5111). The addition of the interaction term, PSS X PSS-Fa, produced a cumulative R^2 of .5868 (adjusted R^2=.5468), an increment of approximately 3.7% of the variance. This difference in R^2 was significant ($\underline{F}(1,93)$=8.3933, $\underline{p}$<.01), indicating that maternal depressive symptomatology during the second half of pregnancy changed at different levels of perceived stress and perceived family support.

In an analogous analysis, it was found that perceived social support from family members, when assessed by MSPSS-Fa, significantly influenced the effects of perceived stress on maternal depressive symptoms ($\underline{F}(1,93)$=4.3623, $\underline{p}$<.05). The regression of maternal depressive symptomatology, measured during the second half of pregnancy, on the control variables, depressive

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symptomatology, assessed in the first half of pregnancy, as well as stress and perceived family support, assessed by MSPSS-Fa, produced an R^2 value of .5444 (adjusted $R^2 = .5057$). The inclusion of the interaction term, PSS X MSPSS-Fa, yielded an R^2 of .5649 (adjusted $R^2 = .5228$), representing a 2.1% increment in explained variance.

These interaction effects are graphically portrayed in Figures 2 and 3. In each of these figures, it can be seen that under high levels of stress, women with greater levels of familial support experience less depressive symptomatology than do women with lower levels of family support, a finding that is consistent with the buffering hypothesis. Conversely, under low levels of perceived stress, women with less family support experience fewer behavioural manifestations of depression than do women with more familial support; this finding is contrary to the buffering hypothesis.

In similar analyses, it was found that perceived support from one's spouse, as assessed by the PSS-Sp or MSPSS-Sp, as well as perceived support from friends, as assessed by PSS-Fr and MSPSS-Fr, did not significantly buffer the effect of perceived stress on maternal depression during the third trimester (see Appendix K).
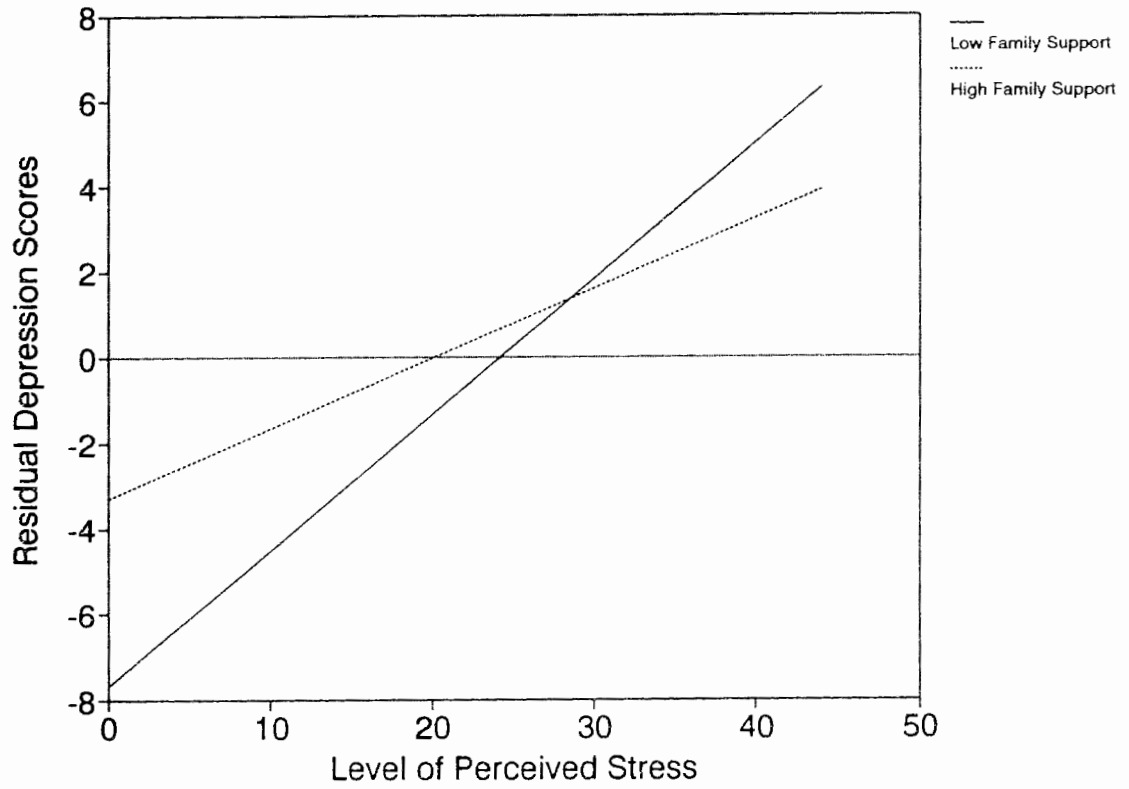
Figure 2: Effects of perceived family support (PSS-Fa)
on perceived stress and residual depression scores
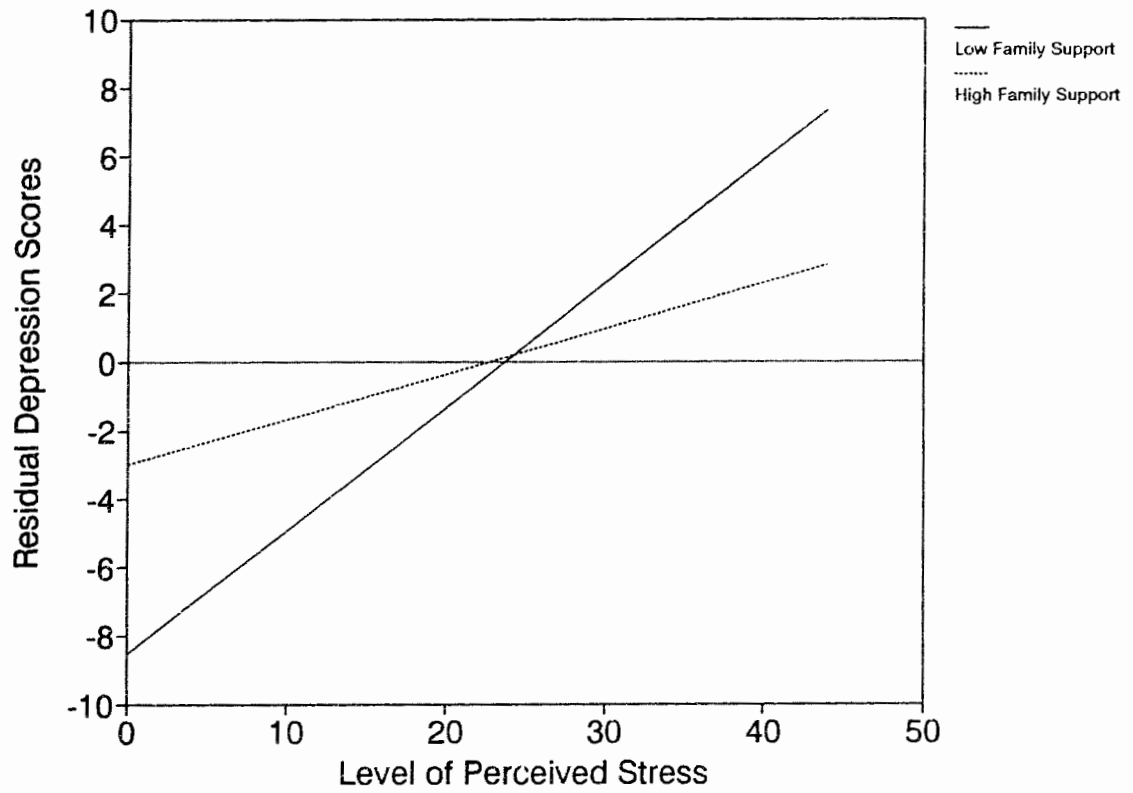
Figure 3: Effects of perceived family support (MSPSS-Fa)
on perceived stress and residual depression scores

These results provide some, though not consistent,
evidence for the hypothesis that support, in this case from
family members, buffers the effect of perceived stress on
maternal depressive symptoms during the second half of
pregnancy. Specifically, at high levels of stress,
perceived family support buffers the effects of perceived
stress on depressive symptomatology. At low levels of
perceived stress, it appears that high levels of perceived
family support has a negative impact on maternal depression;
women with higher levels of family support manifested more
depressive symptomatology than did women with lower levels
of family support.

Obstetrical Measures

By the second half of pregnancy, 11 women were
scheduled to deliver via Cesarean Section; given that the
timing of these deliveries was dependent on medical
intervention, the gestational age and birth weight measures
for these deliveries was not included in further analyses.
Furthermore, data regarding duration of stage 1 and stage 2
labour for these women were absent. The final sample used
to examine obstetrical outcomes, therefore, consisted of 92
women.

Antepartum Fetal Risk Scores

The mean Antepartum Fetal Risk score in the first assessment period (risk-1st) was 5.39 ($\underline{SD}$=1.16, Range=4-10), indicating a high risk level. Based on the rating scale employed by this scale, all women fell within the "high" risk category during the first half of pregnancy. In contrast, the mean Antepartum Fetal Risk score in the second half of pregnancy (risk-2nd) decreased to 3.35 ($\underline{SD}$=1.21, Range=0-8), reflecting a moderate risk level. Further, risk level in the second half of pregnancy was significantly lower than in the first half ($\underline{t}$(91)=24.20, $\underline{p}$<.00005). By the second half, roughly 5% of the women were now classified as "low" risk (n=5), approximately 60% were classified as "moderate" risk (n=55), and about 35% were rated as "high" risk (n=32). Overall, risk level was relatively stable from the first half to the second half of pregnancy (r=.74).

Intrapartum and Neonatal Outcomes

The sections that follow summarize the overall labour, delivery, and neonatal conditions. Detailed information about intrapartum and neonatal outcomes, as well as obstetrical complications, for primiparous and multiparous women can be found in Appendix L.

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The average gestation period was 39.15 weeks (SD=1.48, Range=34-42), the mean duration of stage 1 labour was 530.51 minutes (SD=429.33, Range=60-2,280), and the mean length of stage 2 labour was 75.93 minutes (SD=76.36, Range=3-301).

Of the 92 women, 61% (n=56) of the women had a spontaneous vaginal delivery, and the remaining 39% (n=36) had surgical deliveries. In the latter group, 16% (n=15) had forceps-assisted deliveries, 11% (n=10), vaccum-assisted deliveries, and 12% (n=11) eventually underwent Cesarean sections after prolonged stage 1 labour periods.

The average weight of newborns was 3354.10 grams (SD=422.06, Range=2300-4350), the mean Apgar score at 5 minutes was 9.04 (SD=.74, Range=5-10), and the average time to respiration was 8.80 seconds (SD=39.41, Range=0-300).

Obstetrical Complications

Overall, there was a very low incidence of individual complications. The number and percentage of antepartum, intrapartum, and neonatal complications, as well as the total number of complications, are summarized in Table 9. There were a total of five preterm deliveries: that is, deliveries prior to the 37th completed week of gestation. Three women experienced blood pressure complications during labour, two women experienced prolonged stage 1 labour in

Table 9: Number and percentage of pregnancy complications

	No. of complications	No. of women with complications	Percentage of women with complications
Antepartum	0	n=92	94.5%
	1	n=5	5.5%
Intrapartum	0	n=54	58.2%
	1	n=23	25.3%
	2	n=14	15.4%
	3	n=1	1.1%
Neonatal	0	n=84	91.3%
	1	n=6	6.5%
	2	n=2	2.2%
Total	0	n=47	51.1%
	1	n=22	23.9%
	2	n=22	23.9%
	3	n=1	1.1%

the absence of absolute cephalopelvic disproportion (CPD),
and 16 women experienced prolonged stage 2 labour in the
absence of absolute CPD. Twenty-one of the women required
surgical deliveries (i.e., the use of forceps or vacuum) in
the absence of absolute CPD, the majority of these were
needed by *para I*. Finally, only four Cesarean sections were
performed in the absence of absolute CPD. In total, 41.8%
of the women experienced some kind of intrapartum
complication.

Very few neonatal complications were recorded. Four
infants weighed less than 2500 grams, two newborns had Apgar
scores at 5 minutes less than 7, five neonates took longer
than 89 seconds to sustain respiration, three infants were
born with abnormalities, and one newborn was admitted to the
intensive care nursery. The neonatal complication rate was
8.7%. Overall, 48.9% of the sample experienced one or more
complications during their pregnancy.

Correlations among the obstetrical measures are
presented in Table 10. Overall, the correlations among the
various obstetrical measures were weak, with the following
exceptions; as would be expected, gestational age was
positively, and significantly, associated with birth weight,
indicating that as gestational period increased, birth
weight also increased. Second, there was a positive
relationship between duration of stage 1 and stage 2 labour;
longer stage 1 labour periods were associated with

Table 10: Zero-order correlations among obstetrical measures (df=90, except where noted)

	gestational age	stage 1	stage 2+	birth weight	5 minute Apgar	time to sustain respiration	antepartum fetal risk 1st half	antepartum fetal risk 2nd half	parity
gestational age	1.00								
stage 1	-0.04	1.00							
stage 2	0.01	0.36*	1.00						
birth weight	0.48**	-0.02	-0.11	1.00					
5 minute Apgar	-0.01	0.05	-0.12	-0.08	1.00				
time to sustain respiration	0.12	0.09	0.12	0.11	-0.61**	1.00			
antepartum fetal risk -1st half	-0.07	0.11	0.27	-0.10	-0.05	-0.01	1.00		
-2nd half	-0.18	0.16	0.17	-0.10	-0.01	-0.07	0.74**	1.00	
parity	-0.24	-0.32*	-0.42*	0.03	-0.10	0.05	0.01	-0.09	1.00

+ df=81
alpha=0.001
* p<0.001
**p<0.00005

significantly longer stage 2 labour periods. Third, time
for the newborn to sustain respiration was negatively
related to 5 minute Apgar score. Specifically, longer
latencies to sustain respiration were associated with
significantly lower Apgar scores at 5 minutes. Finally,
parity was inversely related to gestational age, duration of
stage 1 labour, and duration of stage 2 labour; that is,
gestational age, and duration of stage 1 and stage 2 labour
decreased as parity increased.

An inverse relationship was found between antepartum
fetal risk level in the second half of pregnancy and
gestational age; shorter gestational periods were associated
with higher fetal risk levels in late pregnancy. Further,
antepartum fetal risk scores in the first and second half of
pregnancy were positively associated with length of stage 1
and stage 2 labour; as such, length of each labour stage
increased as fetal risk score increased. Finally,
antepartum fetal risk levels in the first and second half of
pregnancy were inversely related to birth weight; that is,
lower birth weights were associated with higher fetal risk
levels.

The remaining zero-order correlations between
demographic variables and obstetrical measures were largely
weak (see Appendix M).

Tables 11 and 12 present the zero-order correlations between the psychosocial and antepartum, intrapartum, and neonatal complications, as well as the total number of pregnancy complications. Tables 13 and 14 include the zero-order correlations between the psychosocial variables and the quantitative measures of pregnancy outcome. Due to the large number of correlations, significance levels were set at *alpha*=.0005 to control for the familywise error rate. None of the individual correlation coefficients evaluated by this criterion were statistically significant. However, there were several unexpected tendencies exhibited between some of the psychosocial and obstetrical measures. Specifically, higher levels of perceived stress during the second half of pregnancy, as well as state anxiety and depression during the first and the second half of pregnancy, were unexpectedly associated with higher birth weights (see Table 13). Further, higher levels of state anxiety during the second half of pregnancy, and depression during the first and second half of pregnancy, were associated with lower Apgar scores at 5 minutes. Contrary to expectations, all measures of support were inversely related to birth weight (see Table 14). The strongest relationships exist between spousal support and birth weight; higher levels of perceived support from one's spouse, as measured by PSS-Sp and MSPSS-Sp, were associated with lower birth weights. In addition, higher levels of perceived spousal support during the first and second half

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Table 11: Zero-order correlations among stress and mood measures and number of antepartum, intrapartum, and neonatal complications, as well as overall complications (df=90)

	Antepartum Complications	Intrapartum Complications	Neonatal Complications	Total Number of Complications
Perceived Stress				
1st half	-0.01	-0.10	0.09	0.08
2nd half	0.09	-0.08	-0.01	0.08
Maternal Mood				
1st half				
state anxiety	-0.06	-0.06	0.17	0.20
depression	-0.10	0.03	0.13	0.14
2nd half				
state anxiety	0.12	-0.10	0.09	0.14
depression	0.08	-0.08	0.06	0.18

+df=81
alpha=0.0005

Table 12: Zero-order correlations between support measures and number of antepartum, intrapartum, and neonatal complications, as well as overall complications (df=90)

	Antepartum Complications	Intrapartum Complications	Neonatal Complications	Total Number of Complications
Spouse Support				
1st half				
PSS-Sp	0.12	-0.01	0.06	0.05
MSPSS-Sp	0.10	0.01	0.02	0.03
2nd half				
PSS-SP	-0.01	0.07	0.15	0.13
MSPSS-Sp	-0.02	0.01	0.04	0.02
Family Support				
1st half				
PSS-Fa	0.10	0.01	-0.12	-0.03
MSPSS-Fa	0.20	0.04	-0.14	0.03
2nd half				
PSS-Fa	0.01	0.02	-0.16	-0.06
MSPSS-Fa	0.01	-0.02	-0.20	-0.11
Friend Support				
1st half				
PSS-Fr	-0.12	0.05	-0.19	-0.07
MSPSS-Fr	-0.01	0.13	-0.18	0.03
2nd half				
PSS-Fr	-0.17	0.05	-0.16	-0.07
MSPSS-Fr	-0.09	0.12	-0.15	0.02

alpha=0.0005

Table 13: Zero-order correlations among stress, mood measures, and (i) intrapartum, and (ii) neonatal outcome measures (df=90, except where noted)

	gest age	stage 1	stage 2+	birth weight	5 minute Apgar	time to respiration
Perceived Stress						
1st half	-0.01	-0.08	-0.08	0.08	-0.22	0.12
2nd half	-0.08	0.01	-0.08	0.08	-0.23	0.07
Maternal Mood						
1st half						
state anxiety	0.07	-0.03	-0.11	0.20	-0.12	0.17
depression	0.10	0.02	0.09	0.14	-0.31	0.27
2nd half						
state anxiety	-0.09	-0.07	-0.20	0.14	-0.27	0.10
depression	-0.06	-0.04	-0.04	0.18	-0.20	0.12

+df=81
alpha=0.0005

Table 14: Zero-order correlations between support measures and (i) intrapartum and (ii) neonatal outcome measures (df=90, except where noted)

	gest age	stage 1	stage 2+	birth weight	5 min Apgar	time to resp
Spouse Support						
1st half						
PSS-Sp	-0.07	0.17	0.19	-0.21	-0.05	0.02
MSPSS-Sp	-0.09	0.15	0.16	-0.09	-0.06	0.01
2nd half						
PSS-SP	-0.02	0.24	0.18	-0.15	-0.05	0.10
MSPSS-Sp	0.01	0.18	0.11	-0.14	0.01	0.02
Family Support						
1st half						
PSS-Fa	-0.05	0.05	0.17	-0.03	-0.02	-0.19
MSPSS-Fa	-0.15	0.15	0.11	-0.13	-0.01	-0.22
2nd half						
PSS-Fa	-0.02	0.06	0.08	-0.02	0.10	-0.23
MSPSS-Fa	-0.01	0.09	-0.01	-0.02	0.13	-0.25
Friend Support						
1st half						
PSS-Fr	-0.05	0.11	0.11	-0.04	0.09	-0.13
MSPSS-Fr	-0.15	0.10	0.12	-0.07	0.03	-0.09
2nd half						
PSS-Fr	-0.02	-0.01	-0.01	-0.18	0.16	-0.11
MSPSS-Fr	-0.05	0.07	0.09	-0.04	0.11	-0.09

+df=81
alpha=0.0005

of pregnancy were associated with longer stage 1 and stage 2 labour periods, findings which, again, were contrary to expectations.

Perceived support from family members was negatively related to time for the newborn to sustain respiration. Specifically, higher levels of support from family members during the first and second half of pregnancy were associated with shorter latencies to sustain respiration.

For the most part, there appear to be weak relationships between the remaining psychosocial measures and gestational age, duration of stage 1 labour, duration of stage 2 labour, birth weight, Apgar score at 5 minutes, and time for the newborn to sustain respiration.

Owing to the relative low incidence of individual antepartum and neonatal complications, as well as the skewed distribution of the number of antepartum, intrapartum, and neonatal complications, further analyses regarding these outcomes measures are reported in Appendix N rather than in the results section.

In order to examine the overall relationship between the psychosocial variables and the quantitative indices of pregnancy outcome, a canonical correlation was performed between these two sets of variables. The psychosocial set included 18 variables, and the obstetrical set, 6 variables (see Table 15). Only the first canonical variable reached

Table 15: Variables included in the psychosocial and
obstetrical sets

Psychosocial Set   Obstetrical Set

· PSS 1st half   · gestational age
·· PSS 2nd half   · duration of stage 1 labour
                                              · duration of stage 2 labour
· PSS-Sp 1st half   · birth weight
· PSS-Sp 2nd half   · 5 minute Apgar score
· MSPSS-Sp 1st half   ·· time to sustain respiration
· MSPSS-Sp 2nd half

· PSS-Fa 1st half
· PSS-Fa 2nd half
· MSPSS-Fa 1st half
·· MSPSS-Fa 2nd half

·· PSS-Fr 1st half
· PSS-Fr 2nd half
·· MSPSS-Fr 1st half
· MSPSS-Fr 2nd half

·· STAI 1st half
·· STAI 2nd half

· BDI 1st half
· BDI 2nd half

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statistical significance ($\underline{X}^2$(108)=135.33, $\underline{p}$=.0386); the canonical correlation was .71, and accounted for 51% of the variance between the two sets of variables. Table 16 presents the canonical loadings for the first canonical variate (i.e., the obstetrical set) and for the second canonical variate (i.e., the psychosocial set). Among the obstetrical variables, birth weight was highly related with the first canonical variate (.57), as was Apgar score at 5 minutes (-.52). The variables in the psychosocial set that were correlated with the first canonical variate were perceived stress in the second half of pregnancy (.41), state anxiety in the second half of pregnancy (.40), and depression in the second half of pregnancy (.47).

Despite the strong canonical correlation, the percentages of variance explained by the first canonical variate (3%), and by the second canonical variate (13%), are low, indicating that the variance of each canonical variate is accounted for by a few variables within each canonical set. As a result, interpretation of the relationship between canonical loadings for the psychosocial and obstetrical sets must be considered with some caution. With this in mind, this pair of canonical variates suggests that women with higher levels of perceived stress, state anxiety, and depression during the second half of pregnancy bear infants with higher birth weights and lower 5 minute Apgar scores.

Table 16: Correlations of canonical loadings between psychosocial and obstetrical variables

	Canonical Variable Loadings
Psychosocial Set	
• PSS 1st half	0.292
• PSS 2nd half	0.409
• PSS-Sp 1st half	-0.065
• PSS-Sp 2nd half	-0.076
• MSPSS-Sp 1st half	0.113
• MSPSS-Sp 2nd half	-0.140
• PSS-Fa 1st half	0.291
• PSS-Fa 2nd half	0.112
• MSPSS-Fa 1st half	0.229
• MSPSS-Fa 2nd half	0.088
• PSS-Fr 1st half	0.045
• PSS-Fr 2nd half	-0.303
• MSPSS-Fr 1st half	0.104
• MSPSS-Fr 2nd half	-0.002
• STAI 1st half	0.206
• STAI 2nd half	0.403
• BDI 1st half	0.349
• BDI 2nd half	0.472
Explained variance	3%
Obstetrical Set	
• gestational age	-0.254
• duration of stage 1 labor	0.180
• duration of stage 2 labor	0.237
• birth weight	0.570
• 5 minute Apgar score	-0.522
• time to sustain respiration	0.123
Explained variance	13%

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Effects of Social Support on Stress and Obstetrical Outcomes

Subsequent regression analyses were conducted to
examine the relationship between individual obstetrical
outcomes, perceived stress, and social support. These
analyses provided the basis from which to examine whether
social support buffered the effects of perceived stress on
obstetrical outcome. It was hypothesized that perceived
support from spouse, family, and friends would each buffer
the effects of stress on (1) intrapartum outcomes (i.e.,
gestational age, length of stage 1, and stage 2 labor); and
(2) neonatal conditions (i.e., birth weight, Apgar score at
5 minutes, and time for the newborn to sustain respiration).
The approach to data analysis was similar to the strategy
described previously. Initially, the obstetrical measure of
interest was regressed on antepartum fetal risk scores,
perceived stress (PSS), and anxiety and depression scores
measured in the first and second half of pregnancy, as well
as perceived support from either spouse, family, or friends,
yielding a reference value of R^2. Interaction terms were
created by multiplying perceived stress during the second
half of pregnancy with each of the six measures of support
during the second half of pregnancy: for spousal support,
PSS X PSS-Sp and PSS X MSPSS-Sp, for support from family,
PSS X PSS-Fa and PSS X MSPSS-Fa, and for support from
friends PSS X PSS-Fr and PSS X MSPSS-Fr. Subsequently, the
interaction term of interest was included in the regression

analysis and the new R^2 was calculated. The difference between these two R^2 values was used to determine whether the addition of the interaction term accounted for a significant amount of explained variance over and above that explained by the initial set of predictors. A significant difference indicates that relationship between the scores on the obstetrical measure of interest and perceived stress varies at different levels of perceived support from others.

Intrapartum Outcomes

Gestational age was initially regressed on antepartum fetal risk scores, state anxiety and depression scores, as well as perceived stress and perceived support from spouse, family, or friends, and then on each of the respective interaction terms. The results of each regression analysis revealed that none of the interaction terms accounted for a significant amount of explained variance over and above that explained by the initial set of predictors (see Appendix O). In other words, perceived support from spouse, family, and friends did not significantly buffer the effect of perceived stress on length of gestation.

Using analogous regression analyses, the duration of stage 1 labour was regressed initially on antepartum fetal risk scores, state anxiety and depression scores, perceived stress, and support from spouse, family, or friends, and

then on the appropriate interaction term. It was found that perceived support, regardless of its source, did not buffer the effects of stress on stage 1 labour (see Appendix P).

Of the 92 women, nine experienced difficulties during stage 1 labour and consequently underwent Cesarean Section; stage 2 data for these women were not available. Stage 2 data was collected on the remaining 83 women who had spontaneous vaginal deliveries, or surgical deliveries. Given the strong relationship between stage 1 and stage 2 labour (r=.36), stage 1 labour was also included as a control variable in the regression analysis of stage 2 labour. Duration of stage 2 labour was regressed initially on duration of stage 1 labour, antepartum fetal risk scores, state anxiety, and depression scores, perceived stress, and support from spouse, family, or friends, and then on the appropriate interaction term. It was found that perceived support, regardless of its source, did not buffer the effects of stress on stage 2 labour (see Appendix Q).

Neonatal Outcomes

Birth weight was regressed on gestational age, antepartum fetal risk level, state anxiety, depression, perceived stress, and perceived support from spouse (as measured by PSS-Sp) measured in the first and second half of pregnancy. Gestational age was included in the initial set

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of predictors as a control variable given its strong association with birth weight (r=.48). This first set of predictors produced an R^2 of .3360 (adjusted R^2=.2447). The subsequent inclusion of the interaction term, PSS X PSS-Sp, in the regression analysis produced an R^2 of .4173 (adjusted R^2=.3288), representing a 8.13% increase in explained variance. This increment in explained variance is significant ($F(1,79)$=11.0179, $p<.01$).

Similar results were found when perceived spousal support was measured by MSPSS-Sp. The initial set of predictors produced an R^2 value of .3129 (adjusted R^2=.2184) whereas the subsequent inclusion of the PSS X MSPSS-Sp term yielded an R^2 value of .3477 (adjusted R^2=.2487), representing a significant increase of 3.48% in explained variance ($F(1,79)$=4.2172, $p<.05$).

These results are graphically illustrated in Figures 4 and 5. Under high levels of stress, women with high levels of spousal support gave birth to heavier babies than women with lower levels of spouse support; these results are consistent with the buffering hypothesis. Under low levels of perceived stress, however, a newborn's birth weight was higher when the mother's perception of spousal support was low; the inverse relationship was found with higher levels of spousal support, a finding that is contrary to the buffering hypothesis.
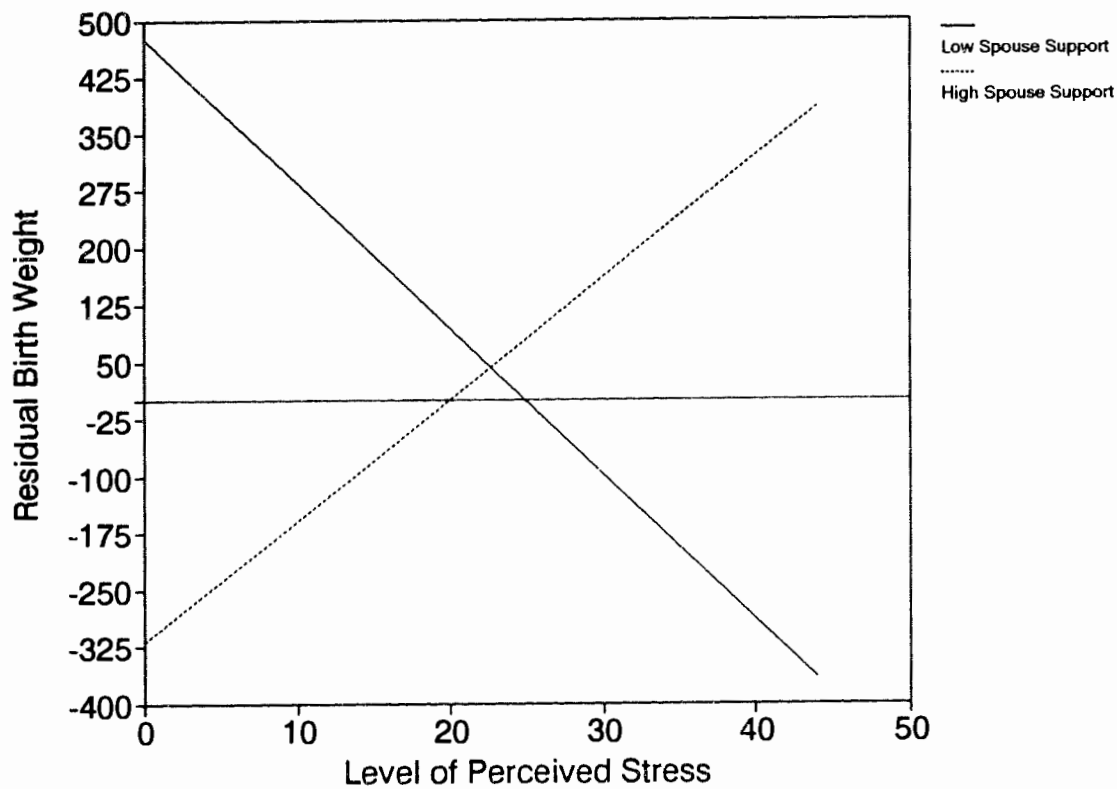
Figure 4: Effects of perceived support from spouse (PSS-Sp)
on perceived stress and residual birth weight
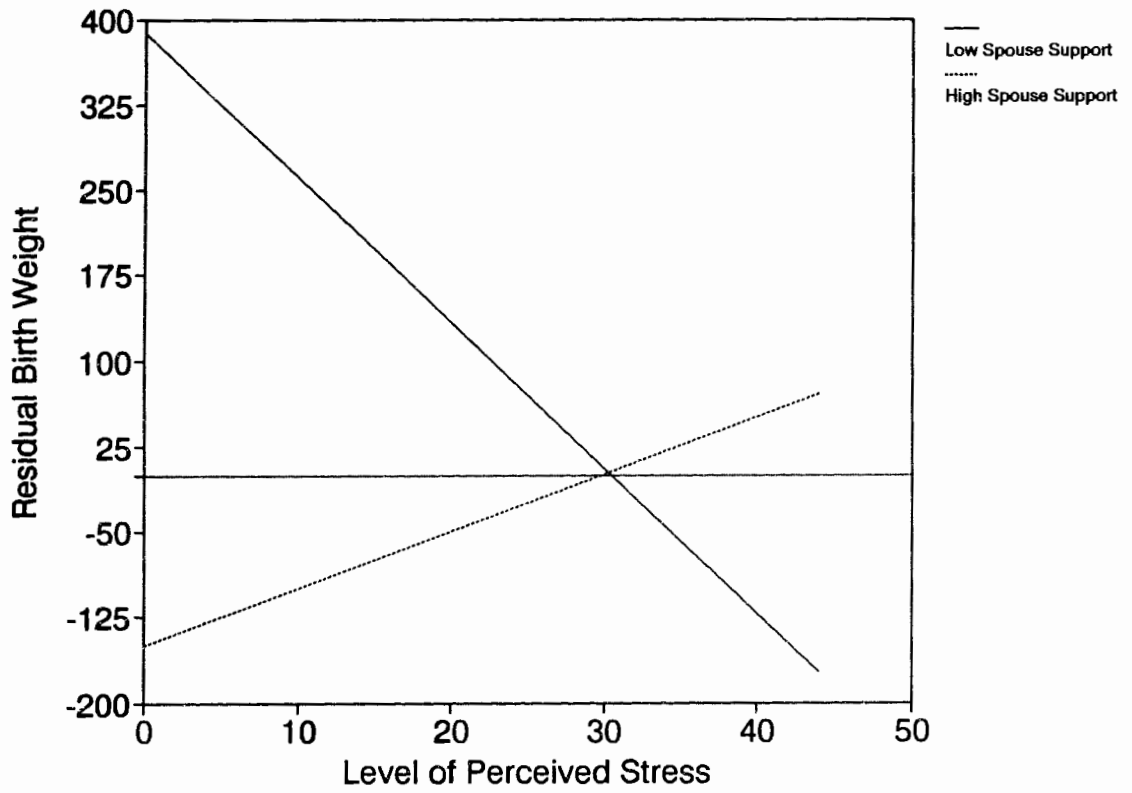
Figure 5: Effects of perceived support from spouse (MSPSS-Sp)
on perceived stress and residual birth weight

Likewise, it was found that support from friends, as measured by PSS-Fr and MSPSS-Fr, influenced the effects of stress on birth weight. When the product of perceived stress and PSS-Fr was added to the regression analysis, R^2 increased from .3535 to .4231 (adjusted R^2=.2646 and .3355 respectively), an increment of approximately 6.96% of explained variance. This increment in explained variance was significant ($\underline{F}(1,79)$=9.5286, $\underline{p}$<.01). Similarly, when the product of perceived stress and MSPSS-Fr was added to the regression equation, R^2 increased about 10.49%, from R^2=.3050 to R^2=.4098 (adjusted R^2=.2094 and .3202). Again, this increment in variance explained was significant ($\underline{F}(1,80)$=14.0417, $\underline{p}$<.01).

As before, women were assigned to one of two groups, low perceived support from friends or high perceived support from friends, by dividing the sample as close to the median as possible on PSS-Fr and on MSPSS-Fr. These results are portrayed in Figures 6 and 7 respectively. The pattern of results shown in each figure is similar. Under high levels of stress, pregnant women with higher levels of support from friends bore heavier babies than did their counterparts with lower levels of support from friends. In contrast, under low stress levels, women with low levels of support from friends gave birth to heavier babies than did women with higher levels of support from friends. Again, the former
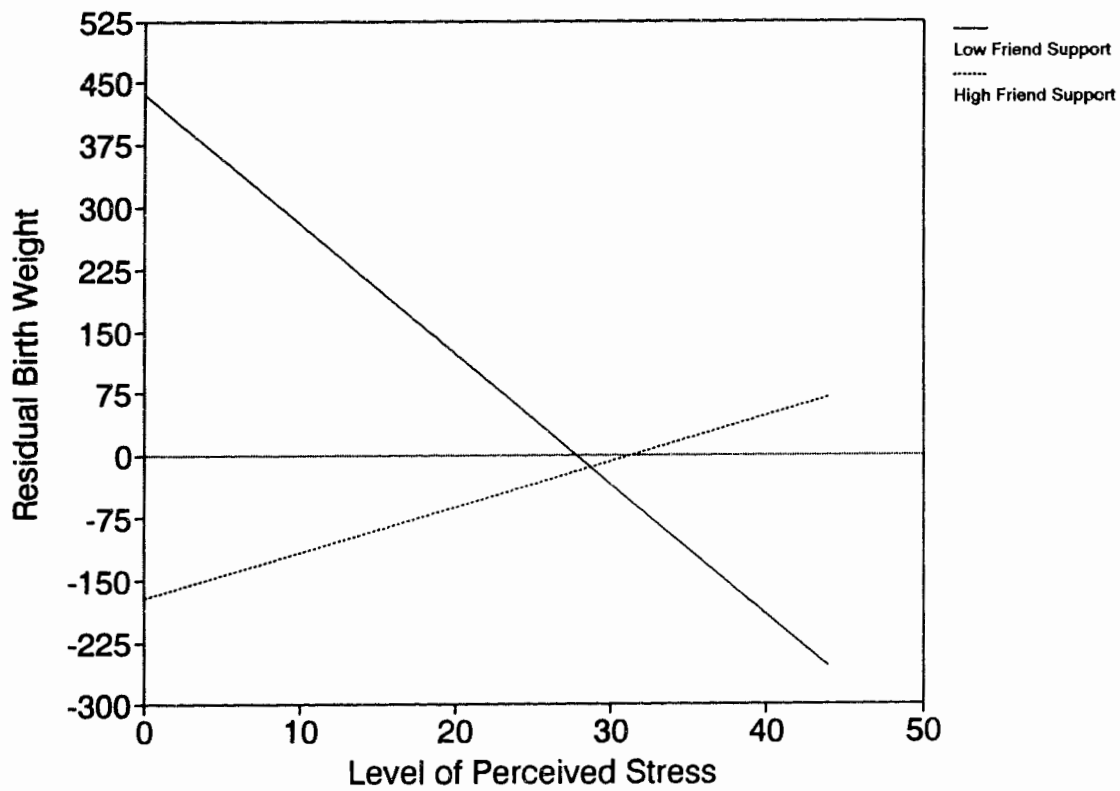
Figure 6: Effects of perceived support from friends (PSS-Fr)
on perceived stress and residual birth weight
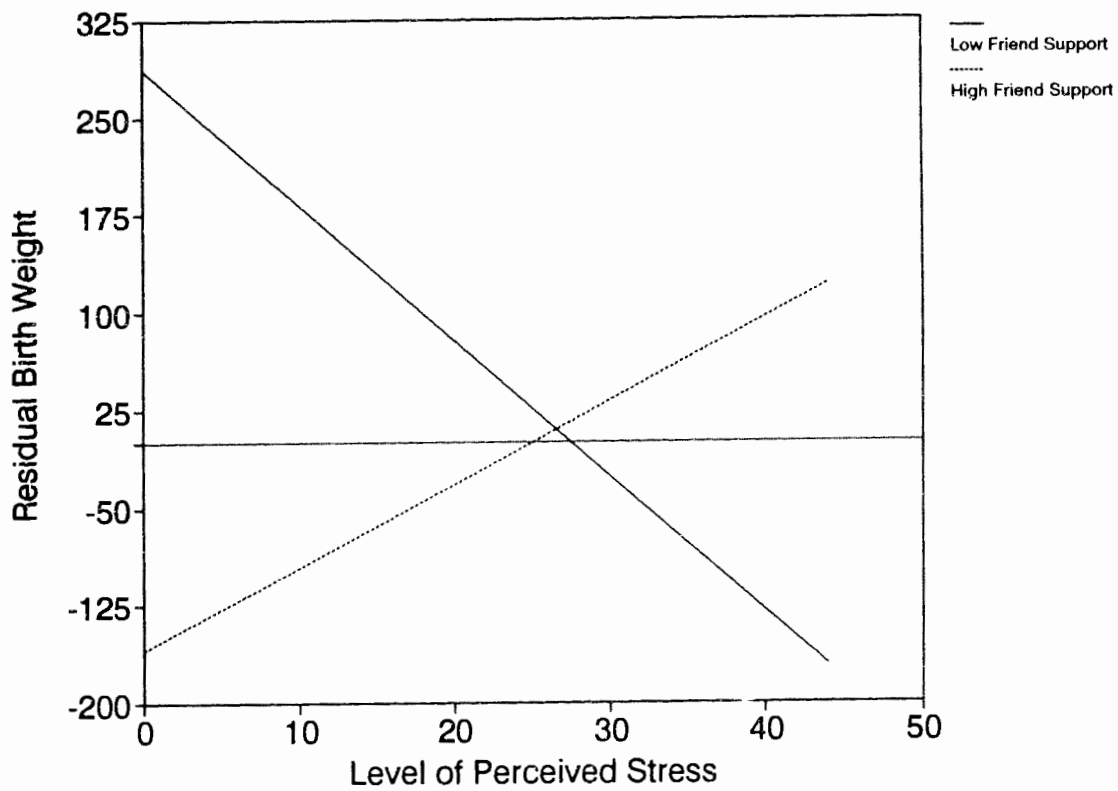
Figure 7: Effects of perceived support from friends (MSPSS-Fr) on perceived stress and residual birth weight

findings are consistent with the buffering hypothesis, while the later are incompatible with buffering hypothesis.

Perceived support from family members, however, did not buffer the effects of perceived stress on birth weight (see Appendix R). Further, support from spouse, family, and friends did not buffer the effect of stress on 5 minute Apgar scores (see Appendix S) or time to sustain respiration (see Appendix T).

Factor Analysis of the Predictor Variables

A factor analysis was performed to examine the underlying structure of the psychosocial variables. There were several reasons for this analysis: (1) to establish that measures of support from each source formed coherent subsets, and that each source was independent of one another, and (2) to establish that measures of support from each source were independent of measures of maternal mood. A series of factor analyses with varimax rotation were performed on the 18 psychosocial variables listed in Table 12, as well as the antepartum fetal risk scores for the first and second half of pregnancy; in each analysis, the number of factors to be included was increased sequentially, from 1 to 10. In order to determine the appropriate number of factors, a modification of the scree test (Cattell, 1966)

was used, in which the Chi^2/df value was calculated for successive number of factors. Each Chi^2/df value was then plotted against its respective number of factors. (See Figure 8). This modification of the scree test shows the improvement in goodness of fit for the successive number of factors. The scree plot provides the opportunity to observe, graphically, any discontinuity in the Chi^2/df values, and the point where the fit plateaus. Six factors were identified using this method. Eigenvalues and variance explained for the six factor solution are presented in Table 17. The six factor solution accounted for 76.9% of the variance.

As shown in Table 18, all 20 measures loaded on one of the six factors, and all factors were internally consistent and well defined by the measures. The first factor, accounting for 30.59% of the variance, is labelled "Perceived Support from Family" and comprises both measures of perceived family support (i.e., PSS-Fa and MSPSS-Fa) administered in the first and second half of pregnancy. The second factor, "Perceived Support from Spouse," accounts for 14.02% of the variance and includes both measures of perceived spousal support (PSS-Sp and MSPSS-Sp) completed in the first and second half of pregnancy. Factor three accounts for 11.18% of the variance and is labelled "Perceived Support from Friends." This factor includes both measures of perceived support from friends (PSS-Fr and

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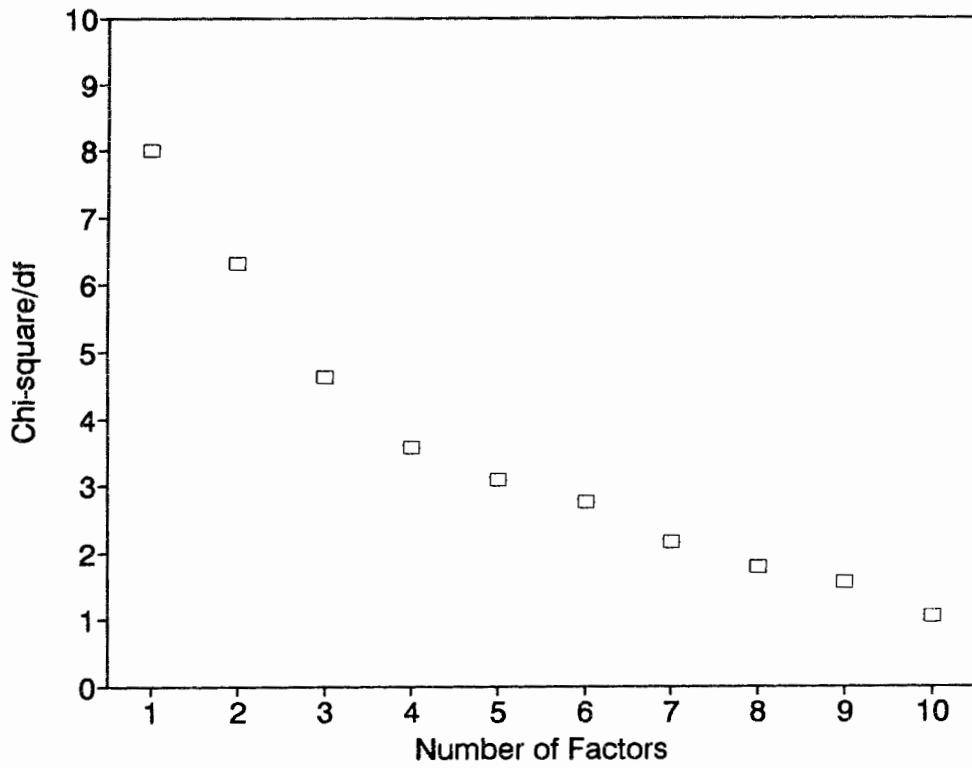
Figure 8: Measure of fit for successive factors

Table 17: Six factor solution

Factor	Eigenvalue	Variance Explained
I	6.1185	0.3059
II	2.8038	0.1402
III	2.2364	0.1118
IV	1.9858	0.0993
V	1.3303	0.0665
VI	0.8974	0.0449
		0.7686

Table 18: Factor analysis of psychosocial measures and antepartum fetal risk scores

Measures	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Support from Family						
PSS-Fa (2nd half)	0.929					
PSS-Fa (1st half)	0.890					
MSPSS-Fa (2nd half)	0.859					
MSPSS-Fa (1st half)	0.827					
Support from Spouse						
PSS-Sp (2nd half)		0.891				
MSPSS-Sp (2nd half)		0.864				
PSS-Sp (1st half)		0.846				
MSPSS-Sp (1st half)		0.783			-0.264	
Support from Friends						
PSS-Fr (1st half)			0.887			
PSS-Fr (2nd half)			0.871			
MSPSS-Fr (1st half)			0.854			
MSPSS-Fr (2nd half)			0.828			
Maternal Mood - 2nd half						
State Anxiety				0.833		
Perceived Stress				0.727		
Depression				0.704	0.285	
Maternal Mood - 1st half						
Perceived Stress				0.259	0.787	
State Anxiety					0.724	
Depression				0.287	0.656	
Antepartum Fetal Risk - 1st half						0.903
Antepartum Fetal Risk - 2nd half						0.779

MSPSS-Fr) completed during the first and second half of pregnancy. The fourth factor, "Maternal Distress during the Second Half of Pregnancy." accounts for 9.93% of the variance and includes the following measures: the Perceived Stress Scale (PSS), the State Anxiety Inventory (STAI), and the revised Beck Depression Inventory (BDI-R) administered in the second half of pregnancy. The fifth factor, "Maternal Distress during the First Half of Pregnancy," accounts for 6.65% of the variance. This factor comprises the PSS, the STAI, and the BDI-R completed prior to 20 weeks gestation. Factor 6, antepartum fetal risk, accounts for 4.49% of the variance, and comprises the antepartum fetal risk scores from the first and second half of pregnancy

This factor solution, which was used to compute factor scores, was employed in place of raw scores for all subsequent analyses.

Table 19 presents zero-order correlations between factor scores and obstetrical measures, respectively. Given the number of correlations, *alpha* was set at .001 to control for the familywise error rate. Although none of the individual correlations between the factor scores and obstetrical variables were significant, there were some modest strength relationships between the factor scores and obstetrical measures. Factor 2, perceived spousal support, was positively correlated with duration of stage 1 labour,

Table 19: Zero-order correlations between factor scores and obstetrical measures (df=90, except where noted)

	gest age	stage 1	stage 2+	birth weight	5min Apgar	time to resp
Factor 1: Support from Family	-0.05	0.06	0.06	0.05	0.04	-0.24
Factor 2: Support from Spouse	-0.03	0.20	0.13	-0.13	-0.09	0.12
Factor 3: Support from Friends	-0.07	0.05	0.04	-0.05	0.10	-0.11
Factor 4: Maternal Distress 2nd half	-0.15	-0.01	-0.07	0.13	-0.27	0.03
Factor 5: Maternal Distress 1st half	-0.09	0.01	-0.04	0.11	-0.17	0.20
Factor 6: Antepartum Fetal Risk	-0.08	0.11	0.25	-0.06	-0.11	0.01

+df=81

indicating that higher levels of perceived spousal support were associated with longer stage 1 labour periods. This relationship between Factor 2 and stage 1 labour is contrary to expectations. Stage 2 labour was positively correlated with Factor 6, antepartum fetal risk; as antepartum fetal risk increased, duration of stage 2 labour increased. Apgar scores at 5 minutes were negatively associated with Factor 4, maternal distress during the second half of pregnancy, suggesting that higher levels of maternal distress during the last half of pregnancy were related to lower 5 minute Apgar scores. Finally, time for the newborn to sustain respiration was negatively correlated with Factor 1, perceived family support, and positively associated with Factor 5, maternal distress during the first half of pregnancy. This suggests that as family support increases, time for the newborn to sustain respiration decreases, and as maternal distress during the first half of pregnancy increases, time for the newborn time sustain respiration also increases. The remaining correlations between factor scores and obstetrical measures were largely weak.

The factor scores derived from the factor analysis were employed in subsequent regression analyses to determine their usefulness in predicting obstetrical outcomes and pregnancy complications. The sections that follow summarize the results of all possible subsets regression analyses where each quantitative pregnancy outcome measure is

regressed on the six factor scores. To briefly reiterate, factor 1 reflects perceived support from family members, factor 2 represents perceived support from one's spouse, factor 3 depicts perceived support from friends, factor 4 portrays maternal distress experienced during the second half of pregnancy, factor 5 represents maternal distress experienced during the first half of pregnancy, and factor 6 reflects antepartum fetal risk.

Prediction of Gestational Age

When gestational age was regressed on factors 1 to 6, results of the all possible subsets regression analysis showed that none of the 6 factors were significant predictors of gestational age ($\underline{F}(1,90)=2.51$, $\underline{p}=.1164$).

Prediction of Duration of Stage 1 Labour

When length of stage 1 labour was regressed on factors 1 to 6, the results of the all possible subsets regression analysis revealed that none of the factors were significant predictors of stage 1 labour ($\underline{F}(1,91)=3.40$, $\underline{p}=.0686$).

Prediction of Stage 2 Labour

Stage 1 labor was strongly related to stage 2 labour (r=.36) and, therefore, was included as a control variable. When duration of stage 2 labour was regressed on factors 1 to 6, duration of stage 1 labour and factor 6, antepartum fetal risk, emerged as significant predictors of stage 2 duration ($\underline{F}$=(2,81)=8.67 $\underline{p}$=.0004), yielding an R^2 of .1763 (adjusted R^2=.15597). Duration of stage 1 labour accounted for approximately 10.5% of explained variance (estimated *Beta*=.06278), and factor 6 accounted for approximately 4.9% of explained variance (estimated *Beta*=18.3769; intercept=45.3296). This suggests that shorter stage 1 labour and lower antepartum fetal risk level predicts shorter stage 2 labour periods. Given that the antepartum fetal risk factor accounts for a small amount of explained variance, it cannot be considered a strong predictor of stage 2 labor duration.

Prediction of Birth Weight

Only the data for women with vaginal deliveries, spontaneous or surgical, were included in this analysis (n=92). Given that birth weight was strongly related to gestational age (r=.48), gestational age was included in this all possible subsets regression analysis as a control variable. When birth weight was regressed on factors 1 to

6, and gestational age, factor 1 perceived family support, factor 4, maternal distress during the second half of pregnancy, and gestational age emerged as the best set of predictors, (F(3,89)=16.20, p<.00005), producing an R^2 of .35314 (adjusted R^2=.33134). Gestational age accounted for about 24.8% of the explained variance in birth weight (estimated Beta=157.525), factor 4 accounted for roughly 8.2% of the variance in birth weight (estimated Beta=144.903), and factor 1 accounted for about 3.7% of the variance (estimated *Beta*=-92.149; intercept=-2795.37). Thus, higher birth weights were associated not only with longer gestational periods (a well known and expected relationship), but also with higher levels of perceived stress during the last half of pregnancy, and lower levels of perceived family support.

Prediction of 5 minute Apgar score

The all possible subsets regression of the 5 minute Apgar scores on Factors 1 through 6 identified two significant predictors (F(2,90)=4.51; p<.0136), producing an adjusted R^2 of .09112 (adjusted R^2=.07092). Specifically, factor 4, maternal distress during the second half of pregnancy accounted for approximately 6.4% of the variance in Apgar scores at 5 minutes (estimated *Beta*=-.200361), and factor 5, maternal distress during the first half of

pregnancy, accounted for about 2.2% of the explained variance in Apgar scores (estimated Beta=-.122713; intercept=9.04301). This suggests that lower levels of maternal distress during the first and second half of pregnancy predict higher Apgar scores at 5 minutes. However, the amount of variance explained by each factor was relatively small.

Prediction of time to sustain respiration

The all possible subsets regression of time to sustain respiration on factors 1 to 6, identified two significant predictors ($F(2,90)=4.69$; $p=.0115$), yielding an R^2 value of .09444 (adjusted $R^2=.7431$). Factor 2, perceived spousal support, accounted for about 6.9% of the variance in time to sustain respiration (estimated Beta=-11.0224), and factor 5, maternal distress during the first half of pregnancy, accounted for about 2.6% of the explained variance (estimated Beta=7.2602; intercept=10.00). Thus, higher levels of perceived support from one's spouse along with lower levels of maternal distress during the first half of pregnancy predict shorter latencies for the newborn to sustain respiration. As can be seen, however, both factors accounted for a relatively small amount of explained variance.

Satisfaction with Support

Overall, the women appeared to be largely satisfied with the support they received from their spouses, family, and friends during the first and second half of pregnancy. Descriptive statistics summarizing satisfaction with support from spouse/partner, family, and friends can be found in Appendix V.

Types and Sources of Support Throughout Pregnancy

During the first half of pregnancy, 66% of the women (n=66) indicated that they found emotional support most useful, 20.8% of the women (n=20) rated practical support most useful, and 10.4% (n=10) found informational support most useful. By the second half of pregnancy, 47.9% (n=46) believed practical support to be most useful, 41.7% (n=40) found emotional support to be most useful, and 10.4% (n=10) rated informational support to be most useful.

Roughly 73% (n=75) of the original sample completed the follow-up questionnaire. Seventy-six per cent of the women (n=57) reported their spouse/partner to be their most important source of emotional support throughout pregnancy. In many instances, the women indicated that this individual's availability/accessibility, intimacy, empathy, and understanding made emotional support from this person

more important to them than the emotional support from others. Additionally, some indicated that these elements helped them to maintain emotional stability such that they were able to cope better with their daily activities and difficulties. Similarly, 69% (n=52) identified their spouse/partner as their most important source of practical support during pregnancy. In most instances, practical support from their nominated individual was most important because of their availability and accessibility, as well as their willingness to help with daily household activities. Finally, 44% of the women (n=33) indicated that their obstetrician was their most important source of informational support during their pregnancy. Most women believed that their obstetrician was their most important source of informational support because his experience, knowledge, and expertise helped to allay worries and fears about their pregnancy. More detailed information regarding types and sources of support during pregnancy can be found in Appendix W.

Chapter 6

DISCUSSION

The present study had three general objectives: The first objective was to investigate the relationships among perceived stress, perceived support, and maternal distress. The second, was to determine whether perceived social support from spouse, family, and friends buffered the effects of perceived stress on (a) maternal distress (i.e., state anxiety and depression) during pregnancy, and (b) obstetrical outcomes. The third objective was more exploratory in nature, and focussed on the extent to which the relationships among support sources, perceived stress, and maternal affective states were able to predict obstetrical outcomes.

As hypothesized, it was found that higher levels of perceived stress in the first and second half of pregnancy were associated with higher levels of maternal state anxiety and depressive symptomatology in both the first and second half of pregnancy. These findings parallel those of previous research in this area where schedules of recent life events (e.g., Norbeck & Tilden, 1983; Yamamoto & Kinney, 1976) or measures of perceived stress (e.g., Tietjen & Bradley, 1985) were used to assess stress levels during pregnancy. In both these former studies, stress, anxiety, and depression were assessed in the third trimester only.

Second, higher levels of perceived social support from spouse, family, and friends were associated with lower levels of perceived stress. Measures of perceived social support from spouse (i.e., PSS-Sp and MSPSS-Sp), perceived social support from family members (i.e., PSS-Fa and MSPSS-Fa), as well as perceived support from friends (MSPSS-Fr) completed in the second half of pregnancy were negatively, and significantly, correlated with perceived stress in the second half of pregnancy. In the first half, only perceived spousal support (MSPSS-Sp) and perceived family (MSPSS-Fa) support were significantly associated with perceived stress.

Moreover, higher levels of perceived social support from spouse, family, and friends in the first half of pregnancy were consistently associated with lower levels of perceived stress in the last half of pregnancy. Although correlational in nature, these relationships provide suggestive evidence for the reciprocal connection between support and stress; specifically, women with initially high levels of support during early pregnancy experience lower levels of stress during the last half of pregnancy.

The relationships between perceived stress and perceived social support found in this study are largely consistent with the findings of previous research, where stress was assessed by life events schedules (e.g., Barrera, 1981; Boyce, et al., 1985; Henderson et al., 1981; Molfese et al., 1987b; Procidano & Heller, 1983). As noted earlier,

measures of life events often included items regarding the direct, or indirect, loss of social support. Negative relationships between life events measures and social support, therefore, may indicate that they are measuring, to some extent, the same concept. The results of the factor analysis, however, indicate that the measures of perceived stress and perceived support employed in this study clustered independently of each other, thereby avoiding the aforementioned problem.

Third, higher levels of perceived support from spouse, family, and friends, as hypothesized, were consistently, though not necessarily significantly, associated with lower levels of maternal state anxiety and depressive symptomatology in the first and third trimesters. Most notably, low levels of state anxiety, particularly in the first half of pregnancy, were strongly linked with perceived support from spouse, whereas behavioural symptoms of depression in the second half of pregnancy were strongly associated with perceived support from family members.

The results of the current research parallel the findings of previous research by Norbeck and Tilden (1983) and Turner et al. (1990), for example. In these studies, however, support and mood states were assessed only once during the pregnancy. The present study extends previous research by examining the relationship between different sources of support and maternal affective states during the

first and the second half of pregnancy. The results of this study indicate that the relationship between perceived support and maternal distress varies according to the assessment period and source of support.

The main goal of this study was to examine the buffering effects of social support. It was hypothesized that social support from spouse, family, and friends would buffer the effects of perceived stress on (1) maternal distress (i.e., state anxiety and depression in the second half of pregnancy), and (2) obstetrical outcomes (e.g., gestational age, length of stage 1 and stage 2 labour, birth weight, Apgar scores at 5 minutes, and time for the newborn to sustain respiration). Although "true" buffering effects were not found in this study, there were several results that were consistent with the buffering hypothesis of social support; specifically, at high levels of stress, women with high levels of perceived family support experienced fewer depressive symptoms than women with low levels of family support. Similarly, under high conditions of stress, women with high levels of support from spouse, and from friends, gave birth to heavier babies than did women with corresponding low levels of support. Therefore, varying levels of social support from spouse, family, and friends were found to have differential effects on depression and birth weight under high levels of perceived stress.

The increments in variance accounted for by the buffering effects of social support ranged from a low of 2.1 percent for depressive symptomatology, to a high of 10.49 percent for birth weight. These findings are consistent with other pregnancy-related research examining the buffering effects of social support on stress and pregnancy complications (e.g., Norbeck & Tilden, 1983), and with general studies investigating the buffering effects of social support on stress and affective distress (e.g., Cohen et al., 1986).

In comparison to past research, this study employed two different measures of perceived support - the PSS scale and the MSPSS. Perceived support from spouse, family, and friend, as measured by the PSS scales, correlated highly with their counterpart scales of the MSPSS, suggesting that the corresponding measures assessed similar constructs - the feeling that spouse, family, and friends are sensitive to one's needs for emotional support, informational support, and instrumental support.

The results of the factor analysis indicate that each source of support, as measured by the PSS scale and the MSPSS, group together to form three distinct factors. With differentiation of support sources, it was possible to identify whose support was most important in allaying the effects of stress on different outcome measures. Further, the results of this study show consistency between the PSS

and MSPSS measures in terms of their influence on stress and outcome measures; when one of the support scales as assessed by the MSPSS was found to have a buffering effect, the corresponding measure from the PSS measure also had a buffering effect in all cases but one. This consistency between corresponding scales generates greater confidence regarding the buffering effects that different sources of support have on stress and outcome measures. In contrast, much of the previous research examined "perceived support" in general with little regard to the sources of the support. From this study, it becomes clear that the perception of *who* provides the support during pregnancy is an important factor to consider when examining the buffering effects of social support.

Unlike much of the previous research, the current study looked at the buffering effects of different sources of social support. It has been generally assumed by researchers (e.g., Lieberman, 1982) that spousal support is a woman's most important source of support during her pregnancy. Based on this assertion, it was hypothesized that support from one's spouse would more effectively buffer the effects of stress on maternal distress and on pregnancy outcomes than support from family and friends. The results do not consistently support this hypothesis. Perceived familial support, but not spousal support, buffered the effects of stress on behavioural symptoms of depression.

Additionally, the buffering effects of friend support accounted for approximately the same amount of variance in birth weight as did the buffering effects of spousal support. Although the majority of the women who participated in this study indicated that their spouses were their most important sources of support during pregnancy, it would seem, from the results of the buffering analyses, that support from family and friends make an important contribution to the well-being of the women and their unborn babies as well.

These results indicate that specific sources of support moderate the effects of stress on some, but not all, outcome measures. This finding reflects a common one reported throughout the social support literature: "all sources of support are not equally effective for a given problem" (Wilcox & Vernberg, 1985, p. 11). On a very general level, it is likely that the women typically relied on, or turned to, some sources of support more than others when dealing with different situations or problems (Sarason, Pierce, & Sarason, 1993). Though that may be the case here, it is unclear why some sources of support buffered the effects of stress on some outcomes, while others did not. Why did perceived support from family members, but not from spouse or friends, for example, buffer the effects of stress on depression? Several possibilities exist. There were a number of women who indicated that support from female

members of their family, such as mothers or sisters, was more important than support from male family members. Their support may have buffered the effects of stress on depression because, having been through the pregnancy experience, they could best understand and accept the behavioural symptoms of depression that the pregnant woman was experiencing. Indeed, Thoits (1986) has indicated that "those who share similar perceptions of, and emotional reactions to, an individual's circumstances (or who can do so vicariously due to previous experience) are the most likely sources of efficacious coping assistance" (p. 421).

Although levels of perceived support from spouse and friends were generally high, it may be that the women perceived their support to be less useful in allaying symptoms of depression when stress was high. The women may not have relied on, or turned to, these sources of support when feeling depressed. The spouse may be experiencing the same stressors as, or different stressors than, his pregnant wife. If the husband is experiencing stress, and he is the individual whom the woman turns to for support, then support may not be as useful or forthcoming (Shinn et al., 1984). Alternatively, the spouse, though supportive, may not be able to truly understand the full extent of the behavioural symptoms of depression that his wife experienced during pregnancy by virtue of being male. Female friends, though perhaps close and having experienced pregnancy before, may

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not have serve as effective stress buffers because there may be a degree of intimacy that must be present before their support could effectively buffer the effects of stress on depression.

Although this study was not designed to delineate the mechanisms responsible for the buffering effects of social support, information collected from women regarding the importance of support during their pregnancy may shed some light. There was a portion of women who specifically indicated that support, particularly emotional support, helped them to maintain their emotional equilibrium so they could cope better with their daily activities. This information, though anecdotal and retrospective in nature, coincides with ideas put forth by other researchers, such as Cohen and Wills (1985) and Thoits (1986), among others. That is, social support may be construed as coping assistance that regulates the negative consequences of perceived stress, such as lowered self-esteem and a perceived lack of control over one's life situation (Stewart, 1989; Wills, 1985). Social support, or the perception that it is available and adequate, may function to regulate self-esteem (Heller et al., 1986). Under high levels of stress, then, perceived social support may be esteem-enhancing, thereby allaying concomitant negative affective responses which could interfere with coping behaviour. Perceived support could function as coping

assistance by helping the women to perceive pregnancy related changes as less stressful (Collins et al., 1993), by helping them to maintain an even emotional keel, and by allowing them to deal more effectively with daily activities.

With respect to the birth weight, it is possible that support from spouse and friend was helpful in maintaining a healthy lifestyle when stress levels were high, which in turn is beneficial to fetal development. Other researchers, such as Aaronson (1989) and Brown (1986), for example, have reported that support during pregnancy is important for maintaining healthy lifestyles. Brown (1986) found that spousal encouragement to maintain a healthy lifestyle during their pregnancy was the highest ranked supportive behaviour by the women. Aaronson (1989) found that perceived support from family members contributed "to pregnant women's adherence to recommended health behaviors" (p. 8). Aaronson's study, however, did not differentiate spousal support from family support. Although the present study did not examine the influence of support on health behaviours, it is possible that perceived support from one's spouse, as well as from one's friends, helped them to maintain health practices, particularly under high stress conditions during which it would be easier to succumb to poor nutritional choices, for example. There is some anecdotal evidence to suggest this may be the case; some of the women reported

that their spouses, like themselves, abstained from coffee and alcohol during the pregnancy, and adhered to healthier lifestyles, which they felt helped them maintain a healthier lifestyle during their pregnancy.

Whether social support buffers the effects of stress may depend on the fit between type of support required and the stressors confronting the pregnant woman. In general, the type of support required by the pregnant woman may be influenced to some extent by parity. More specifically, primiparous women largely indicated that emotional support was more important and useful to them throughout their pregnancy, whereas the multiparous women reported that practical support was more important and useful (see Appendix V). It may be that under stress, emotional support may most effectively buffer the effects of stress for primiparous women. Unlike multipara, the birthing process is a novel experience for the primipara, engendering fears and concerns about labour and delivery, as well as about the health of the unborn baby. As such, emotional support may most effectively buffer the effects of stress for primiparous women. Multipara, unlike primipara, have one or more children at home for whom they must care, an additional responsibility with which they must cope. Although speculation, it is possible that multiparous women found instrumental support (such as help with parenting as well as with other daily household activities) to more effectively

moderate the effects of stress. Previous research by

Norbeck and Tilden (1983) and Collins et al. (1993), in

which at least half the samples were multiparous, has shown

the importance of tangible support. Norbeck and Tilden

(1983) reported that tangible support buffered the effects

of stress on pregnancy complications. Despite the

methodological problems inherent in their research (as

discussed earlier), their findings emphasize the importance

of tangible support in the buffering process during

pregnancy. More systematic research in this regard would be

useful to examine whether different types of support buffer

the effects of stress on pregnancy outcomes for primiparous

and multiparous women. The support measures used to examine

the buffering effects, therefore, must reflect the

functional demands of the situation as seen by the recipient

(Vaux, 1988).

Surprisingly, high levels of perceived social support

were found to have possible negative repercussions when

stress levels were low. Specifically, under conditions of

low stress, women with high levels of family support were

found to have more behavioural symptoms of depression than

their counterparts with low levels of family support.

Similarly, women with high levels of support from spouse,

and from friends, gave birth to lighter babies than did

women with low levels of support from these sources when

stress was perceived to be low. These findings are contrary

to the buffering hypothesis. Regardless of the level of support, there should have been little, if any difference, in depressive symptomatology or birth weight at low levels of stress.

Although these findings are not consistent with the buffering hypothesis, other researchers, such as Cohen and Hoberman (1983), have reported similar findings. In their study, Cohen and Hoberman found that, under low conditions of stress, individuals with high levels of support experienced more physical symptoms than persons with low levels of support. According to Cohen and Hoberman (1983), this finding may have represented an isolated, and perhaps unreliable, incident among a number of analyses conducted to examine the buffering effects of support. The results of the current study, however, reveal that this pattern was extremely consistent in each of regression analyses, and as such cannot be considered an unreliable or isolated incident.

Other researchers (e.g., Coyne, Wortman, & Lehman, 1988; Hobfoll, 1985; Shinn et al., 1984) have pointed out that support can have a negative impact on the health of the recipient, perhaps due to the overprotectiveness and worry of the provider. Too much support, particularly when stress levels are low, may be perceived as "smothering" (Cobb, 1978; cited in LaRocco, 1983), unwanted, intrusive, or controlling. This point is particularly relevant here,

given that pregnancy is an event where the provision of
social support is the norm. That is, the high levels of
support from spouse, family, and friends may have interfered
with the women's ability to cope. Just as high levels of
support may buffer stress indirectly through self-esteem, so
too may high levels of support indirectly affect self-esteem
when stress levels are low. It may undermine the woman's
self-esteem if the implicit message accompanying the support
is that she is incompetent (Brickman, Rabinowitz, Karuza et
al., 1982; cited in Sarason, Pierce, & Sarason, 1993, p.
117). There is some evidence for this prospect: Unger and
Wandersman (1985) indicated that too much support from the
grandmother in raising the newborn undermined the adolescent
mother's confidence and adjustment. This suggests that
support, to be useful, must fit the situation: it is
possible that too much support under conditions of low
stress may be overwhelming just as too little support under
conditions of high stress may be detrimental.

Finally, perceived social support, regardless of
source, did not buffer the effects of perceived stress on
maternal anxiety, or on any of the other obstetrical
measures. It is possible that the support rendered did not
fit that which was required by the women. According to the
buffering hypothesis, the moderating effects of support will
be observed only under certain conditions: in particular,
support must match the coping requirements posed by the

stress encountered (Vaux, 1988). That is, support must correspond with the needs created by the stress (Shumaker & Brownell, 1984). As Shumaker and Brownell (1984) further point out, "lack of fit does not necessarily mean lack of support" (p. 25). This may be the case here as well: the women received high levels of support when perceived stress was high, but it was support that did not fit the woman's situation.

From a statistical perspective, it is not too surprising that so few buffering effects were found, particularly with respect to the obstetrical outcome measures. Limited variation in the support measures, particularly with the MSPSS measures, created problems when testing the buffering hypothesis. To adequately test the buffering hypothesis, there must be high and low social support conditions (Vaux, 1988). The data collected from the support measures employed in this study, however, were skewed toward high support, which according to Depner et al. (1984), is a common problem among measures of perceived social support. The majority of women scored in the upper range on the support measures, indicating that they felt well supported by spouse, family, and friends. In essence, the women assigned to the "low" support condition actually perceived themselves to have essentially high levels of support, though their level of support was lower relative to those assigned to the "high" support condition. The lack of

difference between the high and low support conditions, therefore, does not provide a good contrast between support conditions necessary to adequately examine the buffering effects of social support.

Despite this shortcoming, the fact that buffering effects were observed consistently suggests that even this small difference in support levels may have important effects on perceived stress and depression, or birth weight. With some of the other outcome variables, particularly state anxiety, the small difference between the two levels of support may have been too subtle for a buffering effect to be observed. That is, had the low support condition been substantially lower in contrast to the high support condition, then perhaps a buffering effect may have been observed.

A related point concerns the variance in the pregnancy outcome variables: except for duration of stage 1 and stage 2 labour and birth weight, there was very little variance in the remaining obstetrical outcomes. Only five babies were delivered prematurely, only 2 infants had 5 minute Apgar scores less than 7, and only 5 newborns took longer than 89 seconds to sustain respiration. The lack of variability in the outcome variables may have likewise led to an underestimation of the buffering effects of social support.

In the current study, social support and perceived stress, as well as state anxiety and behavioural symptoms of depression, were consistently and weakly correlated with the obstetrical outcome measures. These findings are consistent with those reported by other researchers, such as Beck, Siegel, and Davidson et al. (1980), Molfese et al. (1987a), and Norbeck and Tilden (1983), and suggest that the psychosocial variables, as measured here, are not strong determinants of obstetrical outcome.

The lack of variability observed between the psychosocial and obstetrical measures limited the former's usefulness in developing a psychosocial model to predict which women would be at risk for adverse obstetrical outcomes. In the simple correlational analyses, as well as in the canonical correlational analysis, few of the individual psychosocial variables were strongly related to pregnancy outcomes. When the psychosocial variables (as well as the antepartum fetal risk scores) were grouped into six factors, and regression analyses were conducted, few of these factors were identified as significant predictors of obstetrical outcomes or pregnancy complications. Gestational age and length of stage 1 labour could not be predicted by any combination of the six factors. The amount of variance that the six factors accounted for in the remaining obstetrical outcomes was typically small, ranging from 2.2% to 8.2%. Not surprisingly, birth weight was best

predicted by gestational age: longer gestational periods were associated with high birth weights. Overall, it appears that these psychosocial variables, and factors into which they were combined, are at best weak determinants of pregnancy outcomes.

Previous researchers (e.g., Chalmers, 1983; Molfese et al., 1987a; Norbeck & Anderson, 1983; Pagel et al., 1990; Smilkstein et al., 1984) have likewise found psychosocial variables to be weak predictors of obstetric outcome. Although in some cases, one or two of the psychosocial variables were found to be statistically significant predictors of pregnancy outcome, the total amount of variance for which they accounted was typically small. As such, it would be erroneous to conclude that they made a clinically meaningful contribution to the prediction of pregnancy outcome. The results of this study, like those of the previous ones, do little to delineate the etiology of adverse pregnancy outcomes.

Contrasted with previous research, there are a number of important differences incorporated into the present study that reflect substantial improvements in methodology. These include the following: (1) multiple measures of social support were used, and support was assessed throughout pregnancy, rather than once, as most researchers have done; (2) social support measures were independent of both the stress measure and the maternal distress measures, a common

criticism of previous research (Pagel et al., 1990; Thoits, 1982) because both risk factors, stress, and maternal distress may covary with support: (3) obstetrical risk factors such as age, smoking, parity, past obstetrical history were statistically controlled: (4) like the study conducted by Turner et al. (1990), this study controlled gestational age when examining birth weight, the majority of other studies did not: and (5) this study was longitudinal, and prospective in design. Taking these factors into account eliminated many of the methodological problems associated with previous studies in this area. Consequently, greater care has been taken to control the effects of third variables so that the contribution of the psychosocial variables could be examined independent of the effects of these other variables.

Despite the aforementioned strengths, there were several problems inherent in this study. First, there was a substantial attrition rate. While there were no significant differences between those women who completed the study and those who did not on a number of demographic and psychosocial variables, it is still impossible to determine the contribution the lost data may have had on the various regression analyses. Furthermore, failure to find more buffering effects may be due to insufficient power resulting from the attrition rate (Cohen et al., 1986).

Second, as described earlier, the MSPSS appears to have produced ceiling effects. Most women scored in the upper range on these measures of social support suggesting that they uniformly perceived themselves to be well supported by spouse, family, and friends. Two possibilities may exist to explain the ceiling effects obtained with the MSPSS. Pregnancy is a time where the provision of extra support from others is really the norm in our society, so scoring high on measures of support may not be unusual. Yet the PSS scales employed in this study showed a more even distribution of scores for spouse, family, and friends, suggesting that perhaps the MSPSS may not be sensitive enough to distinguish among varying levels of support. While Zimet et al. (1990) obtained similar results when they used these scales with a variety of populations, including pregnant women, the results of this study suggest a need for further refinement of these scales to ensure a more even distribution of scores.

The measures of perceived support from family and friends lacked specificity: each was rated as a group. This proved problematic for some women because some family members and friends were supportive, while others, with whom they had frequent contact throughout their pregnancy, were not. The manner in which the women handled this discrepancy is not clear. It is likely that some rated only those family members and friends from whom they received support,

and omitted the others. It is likely that some women included acquaintances as well close friends when evaluating perceived support from friends. Others did their best to provide their best estimation of their average sense of support received from all family and friends.

Future research may find that greater specificity will clarify the effects of support. Rather than asking about support from "family" or "friends" in general, it may be more fruitful to ask about those family members or friends who they turn to specifically for support. An additional strategy would be to have the women list all significant relationships and rate each one according to the support indices of interest. This approach would serve several purposes. First, the researcher could identify the persons within an individual's network on whom they rely for, or who actually provide, emotional, practical, and informational support (Vaux, 1988). This would avoid the implicit assumption that relationships with all family members and friends are supportive, and instead would allow researchers to examine those that generally are supportive (Vaux, 1988). Second, it would allow the researcher to examine the effects of unsupportive relationships on affective states and pregnancy outcomes.

To briefly reiterate, the results of the present study indicate that, under high levels of stress, social support can buffer the effects of stress on some, but not all,

obstetrical outcomes and maternal affective states. The source of support, as well as the type of support required, are important factors to consider when examining the buffering effects of social support. Finally, there is also evidence to suggest that under low levels of stress, social support may be associated with poorer psychological and obstetrical outcomes. Further research, therefore, is required to understand the potentially negative impact that high levels of support may have when stress is low.

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Appendix A

Perceptions of Stress Questionnaire

PERCEPTIONS OF STRESS

DIRECTIONS: The questions provided below ask you about your thoughts and feelings during the past month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question, circle the number from the following alternatives that best reflects your thoughts and feelings:

1. Never
2. Almost Never
3. Sometimes
4. Fairly Often
5. Very Often

	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly?	1	2	3	4	5
2. In the last month, how often have you felt you were unable to control the important things in your life?	1	2	3	4	5
3. In the last month, how often have you felt nervous and "stressed"?	1	2	3	4	5
4. In the last month, how often have you dealt successfully with irritating life hassles?	1	2	3	4	5
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	1	2	3	4	5
6. In the last month, how often have your felt confident about your ability to handle your personal problems?	1	2	3	4	5
7. In the last month, how often have you felt things were going your way?	1	2	3	4	5

		Never	Almost Never	Sometimes	Fairly Often	Very Often
8.	In the last month, how often have you found that you could not cope with all the things that you had to do?	1	2	3	4	5
9.	In the last month, how often have you been able to control irritations in your life?	1	2	3	4	5
10.	In the last month, how often have you felt that you were on top of things?	1	2	3	4	5
11.	In the last month, how often have you been angered because of things that happened that were outside of your control?	1	2	3	4	5
12.	In the last month, how often have you found yourself thinking about things that you have to accomplish?	1	2	3	4	5
13.	In the last month, how often have you been able to control the way you spend your time?	1	2	3	4	5
14.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	1	2	3	4	5

Appendix B

Perceived Social Support From Spouse (PSS-Sp), Family

(PSS-Fa), and Friends (PSS-Fr)

DIRECTIONS: The statements that follow refer to feelings and experiences which occur to most people at one time or another in their relationship with their spouse or partner. For each statement, there are five possibilities, ranging from "Strongly Disagree" to "Strongly Agree." Read each statement and then circle the number that best reflects your thoughts and feelings regarding your relationship with your spouse or partner since you became pregnant.

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
1.	My spouse/partner gives me the moral support I need.	1	2	3	4	5
2.	I get good ideas about how to do things or make things from my spouse/partner.	1	2	3	4	5
3.	Most other people are closer to their spouse/partner than I am.	1	2	3	4	5
4.	When I confide in my spouse/partner, I get the idea that it makes him/her feel uncomfortable.	1	2	3	4	5
5.	My spouse/partner enjoys hearing about what I think.	1	2	3	4	5
6.	My spouse/partner shares many of my interests.	1	2	3	4	5
7.	My spouse/partner comes to me when he/she has problems or needs advice.	1	2	3	4	5
8.	I rely on my spouse/partner for emotional support.	1	2	3	4	5
9.	I can go to my spouse/partner if I was just feeling down, without feeling funny about it later.	1	2	3	4	5
10.	My spouse/partner and I are very open about what we think about things.	1	2	3	4	5
11.	My spouse/partner is sensitive to my personal needs.	1	2	3	4	5
12.	My spouse/partner comes to me for emotional support.	1	2	3	4	5
13.	My spouse/partner is good at helping me solve problems.	1	2	3	4	5

	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
14. I have a deep sharing relationship with my spouse/partner.	1	2	3	4	5
15. My spouse/partner gets good ideas about how to do things or make things from me.	1	2	3	4	5
16. When I confide in my spouse/partner, it makes me feel uncomfortable.	1	2	3	4	5
17. My spouse/partner seeks me out for companionship.	1	2	3	4	5
18. I think my spouse/partner feels that I'm good at helping him/her solve problems.	1	2	3	4	5
19. I don't have a relationship with my spouse/partner that is as intimate as other people's relationships with their spouses/partners.	1	2	3	4	5
20. I wish my spouse/partner was much different.	1	2	3	4	5

DIRECTIONS: The statements that follow refer to feelings and experiences which occur to most people at one time or another in their relationships with their families (not including your spouse or partner). For each statement, there are five possibilities, ranging from "Strongly Disagree" to "Strongly Agree." Read each statement carefully and then circle the number that best reflects your thoughts and feelings regarding your relationship with your family since you became pregnant.

	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
1. My family gives me the moral support I need.	1	2	3	4	5
2. I get good ideas about how to do things or make things from my family.	1	2	3	4	5
3. Most other people are closer to their family than I am.	1	2	3	4	5
4. When I confide in the members of my family who are closest to me, I get the idea that it makes them feel uncomfortable.	1	2	3	4	5
5. My family enjoys hearing about what I think.	1	2	3	4	5
6. Members of my family share many of my interests.	1	2	3	4	5
7. Certain members of my family come to me when they have problems or need advice.	1	2	3	4	5
8. I rely on my family for emotional support.	1	2	3	4	5
9. There is a member of my family I could go to if I was just feeling down, without feeling funny about it later.	1	2	3	4	5
10. My family and I are very open about what we think about things.	1	2	3	4	5
11. My family is sensitive to my personal needs.	1	2	3	4	5
12. Members of my family come to me for emotional support.	1	2	3	4	5
13. Members of my family are good at helping me solve problems.	1	2	3	4	5

	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
14. I have a deep sharing relationship with a number of members of my family.	1	2	3	4	5
15. Members of my family get good ideas about how to do things or make things from me.	1	2	3	4	5
16. When I confide in members of my family, it makes me feel uncomfortable.	1	2	3	4	5
17. Members of my family seek me out for companionship.	1	2	3	4	5
18. I think my family feels that I'm good at helping them solve problems.	1	2	3	4	5
19. I don't have a relationship with a member of my family that is a intimate as other people's relationships with family members.	1	2	3	4	5
20. I wish my family was much different.	1	2	3	4	5

DIRECTIONS: The statements that follow refer to feelings and experiences which occur to most people at one time or another in their relationships with their friends. For each statement, there are five possibilities, ranging from "Strongly Disagree" to "Strongly Agree." Read each statement and then circle the number that best reflects your thoughts and feelings regarding your relationships with your friends since you became pregnant.

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
1.	My friends give me the moral support I need.	1	2	3	4	5
2.	Most other women are closer to their friends than I am.	1	2	3	4	5
3.	My friends enjoy hearing about what I think.	1	2	3	4	5
4.	My friends come to me when they have problems or need advice.	1	2	3	4	5
5.	I rely on my friends for emotional support.	1	2	3	4	5
6.	If I felt one or more of my friends were upset with me, I'd just keep it to myself.	1	2	3	4	5
7.	I feel that I'm on the fringe in my circle of friends.	1	2	3	4	5
8.	There is a friend I could go to if I was just feeling down, without feeling funny about it later.	1	2	3	4	5
9.	My friends are very open about what we think about things.	1	2	3	4	5
10.	My friends are sensitive to my needs.	1	2	3	4	5
11.	My friends come to me for emotional support.	1	2	3	4	5
12.	My friends are good at helping me solve problems.	1	2	3	4	5
13.	I have a deep, sharing relationship with a number of friends.	1	2	3	4	5

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
14.	My friends get good ideas about how to do things or make things from me.	1	2	3	4	5
15.	When I confide in my friends, it makes me feel uncomfortable.	1	2	3	4	5
16.	My friends seek me out for companionship.	1	2	3	4	5
17.	I think my friends feel that I'm good at helping them solve problems.	1	2	3	4	5
18.	I don't have a relationship with a friend that is as intimate as other people's relationships with friends.	1	2	3	4	5
19.	I've recently gotten a good idea about how to do something from a friend.	1	2	3	4	5
20.	I wish my friends were much different.	1	2	3	4	5

Appendix C

Multidimensional Scale of Perceived Social Support from
Spouse (MSPSS-Sp), Family (MSPSS-Fa), and Friends (MSPSS-Fr)

We are interested in your feelings and experiences with different people in your life since you became pregnant. You will find that several statements refer to a "special person." In these statements, we want you to consider your husband or partner as your special person.

Read each statement carefully. For each statement, circle the number that best reflects how you feel about it.

Circle 1 if you Very Strongly Disagree
2 if you Strongly Disagree
3 if you Mildly Disagree
4 if you are Neutral
5 if you Mildly Agree
6 if you Strongly Agree
7 if you Very Strongly Agree

		Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
1.	There is a special person who is around when I am in need.	1	2	3	4	5	6	7
2.	There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
3.	My family really tries to help me.	1	2	3	4	5	6	7
4.	I get the emotional help and support I need from my family.	1	2	3	4	5	6	7
5.	I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6.	My friends really try to help me.	1	2	3	4	5	6	7
7.	I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8.	I can talk about my problems with my family.	1	2	3	4	5	6	7
9.	I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
10.	There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
11. My family is willing to help me make decisions.	1	2	3	4	5	6	7
12. I can talk about my problems with my friends.	1	2	3	4	5	6	7

Appendix D

Type of Support Most Useful

We would like to know about the different types of support/assistance you received during the past month of your pregnancy. For the purpose of this questionnaire, there are several types of support we would like you to consider:

Emotional Support	a shoulder to lean on, or help you find comforting or soothing when you felt upset or worried, for example
Practical Assistance	help provided in completing tasks such as help with daily housework, looking after the kids, or running errands, for example
Advice/Guidance	providing you with important or useful information or helpful suggestions, when you have problems or concerns, for example

Overall, which type of support/assistance was most useful to you over the past month of your pregnancy? (check one only)

Emotional Support   _____

Practical Assistance   _____

Advice/Guidance   _____

Appendix E

Type and Source of Support Most Useful Throughout Pregnancy

We would like to know whose emotional support was most important to you during your pregnancy. For the purpose of this study, we want your to consider emotional support as:

A shoulder to lean on, or help you found comforting or soothing when you felt upset or worried, for example

Take some time to think back about your pregnancy. Whose emotional support was most important to you during your pregnancy? Identify one person only, such as your husband, mother, or sister, for example.

_____

In what ways was the emotional support from this person more important to you than the emotional support from others?

_____

_____

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We would like to know whose practical assistance was most important to you during your pregnancy. For the purpose of this study, we want you to consider practical assistance as:

Help provided in completing tasks, such as help with daily housework, looking after the kids, or running errands, for example

Take some time to think back about your pregnancy. Whose practical assistance was most important to you during your pregnancy? Identify one person only, such as your husband, mother, or sister, for example.

_____

In what ways was the practical assistance from this person more important to you than the practical assistance from others?

_____

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_____

_____

We would like to know whose advice/guidance was most important to you during your pregnancy. For for the purpose of this study, we want you to consider advice/guidance as:

Providing important or useful information, or providing helpful suggestions when you had difficulties or concerns, for example

Take some time to think back about your pregnancy. Whose advice/guidance was most important to you during your pregnancy? Identify one person only, such as your husband, mother, or sister, for example.

_____

In what ways was the advice/guidance from this person more important than the advice/guidance from others?

_____

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_____

Overall, which type of support/assistance was most important to you throughout your pregnancy? (check one only)

Emotional Support   _____

Practical Assistance   _____

Advice/Guidance   _____

Why was this type of support/assistance the most useful to you throughout your pregnancy?

_____

_____

_____

_____

_____

Overall, which type of support/assistance was least useful to you throughout your pregnancy? (check one only)

Emotional Support   _____

Practical Assistance   _____

Advice/Guidance   _____

Why was this type of support/assistance the least useful to you throughout your pregnancy?

_____

_____

_____

_____

_____

Appendix F

Antepartum Fetal Risk Score

NAME: _____

A. Present Pregnancy

WEEKS OF GESTATION TODAY = [____]

Para ____ Gravida ____ Date Certain __Yes __No
L.M.P. _____ L.M.P. Normal __Yes __No
E.D.C. _____ Cycle Regular __Yes __No
B.C.P's less than one month prior to
    conception .... Yes ___ No ___

Age: 15 yrs or less or 35–39 yrs	1 ____
40 yrs + ...	2 ____
Parity 0	1 ____
5 + ...	2 ____
Prepregnant weight: 45 kg (100 lbs) or less	1 ____
90 kg (200 lbs) or more	2 ____
Bleeding > 20 weeks, ceased	1 ____
continues and, or with pain	2 ____
Rupture of Membranes	
> 12 hrs prior to onset of labour	2 ____
Multiple pregnancy (twins, etc.)	3 ____
Breech or other malpresentations	
> 36 wks or at labour onset	3 ____
Hydramnios	3 ____
Known Fetal Anomaly (anencephaly,	
hydrocephaly, etc.) ..	4 ____
Intrauterine Growth Retardation	
Suspected	2 ____
Definite	3 ____
Estrogens – Falling serial values	2 ____
Rb or other Antibodies Present	1 ____
or Rising Antibody Titre (2 tubes +) .	2 ____
or Amniotic Fluid Liley Zone II	3 ____
or Amniotic Fluid Liley Zone III	4 ____
Hgb. on Admission 8–10 gms	1 ____
< 8 gms	2 ____
Smoking More than one pack per day	1 ____
Prenatal Care at 36 wks < 3 visits	1 ____
or at onset of labour No visits	2 ____
Heart or Lung Disease	2 ____
Symptomatic at rest	3 ____

Renal Disease	2 ____
with diminished renal function	3 ____
Diabetes: Gestational incl abnormal G.T.T.	2 ____
Prior to pregnancy	3 ____
Hypertension – Two or more elevated values	
Diastolic – 90+	2 ____
Diastolic – 110+	3 ____
Eclampsia	3 ____

Other Medical Problems (threatening THIS pregnancy)
a) Serious Infection (Rubella, TB,
   Syphilis, Hepatitis, etc.) .... ____
b) Malignant Disease .... ____
c) CNS or psychiatric disorder .... ____
d) Endocrine (Thyroid, Adrenal, etc.) ____
e) Drug Addiction or Abuse incl Alcohol ____
f) Other – Specify _____
   (Social, etc.) ____

Check each problem but SCORE problem of
   greatest risk to pregnancy:

	Mild	1 ____
Category = _____	Moderate .	2 ____
a, b, c, etc.	Severe ...	3 ____

Cervical Incompetence .... 3 ____
Surgery during THIS pregnancy (except
   cerclage) requiring general anesthesia:
   Minor (specify) _____ 1 ____
   Abdominal or other major surgery
   (specify) _____ 2 ____

SCORE SECTION A:
  (if less than 4, score actual number)
  (if more than 4, score 4)   MAXIMUM=4   [____]

B. Previous Obstetrical History

Uterine Surgery (C-Section, Hysterotomy,	
Myomectomy, etc.)	____
Cervical Cerclage (Shirdodkar Suture)	____
Abruptio Placentae	____
Hypertension during pregnancy	____
Breech or other malpresentation	____
Large infant > 10 lbs (4.5 kg)	____
Small infant < 5 lbs (2.5 kg)	____
One of the above .... 1 ____	
Two or more of the above .... 2 ____	

Fetal or Neonatal Death
   specify number (___) .... 2 ____
Major Congenital or Genetic Abnormality
   specify: _____ 2 ____
Erythroblastosis (regardless of outcome) ... 2 ____

SCORE SECTION B:
  (if more than 2, score 2)   MAXIMUM=2   [____]

C. GESTATIONAL AGE (at time of scoring)

28 weeks or less	4 ____
32 weeks or less	3 ____
35 weeks or less	2 ____
37 weeks or less	1 ____
42 weeks or more	2 ____

SCORE SECTION C:

  (Use actual number)   MAXIMUM=4   [____]

FETAL RISK SCORE TOTAL
         A + B + C =   [____]
         MAXIMUM=10

Appendix G

Labour and Delivery Information Record Form

Name: _____

LABOR AND DELIVERY INFORMATION

Weeks of gestation at time of delivery _____

Duration of 1st stage _____ (hours & minutes)

Duration of 2nd stage _____

Systolic BP over 140mm or diastolic BP   Yes _____   No _____
over 90mm on 2 occasions over a period
of at least 6 hours during labor of the
postpartum period

Presence of cephalopelvic disproportion   Yes _____   No _____

Delivered by: Spontaneous Vaginal Delivery   _____

               Cesarean Section   _____

               Midforceps   _____

               Vacuum   _____

NEONATAL INFORMATION

Apgar Rating at 5 minutes _____

Time to sustain respiration _____

Birth weight _____   Sex _____

Admission to intensive care nursery   Yes _____   No _____

Abnormalities of the newborn _____

_____

_____

_____

Stillborn or neonatal death within _____
the first 2 weeks

                                       OB (Initial): _____

Appendix H

Sample Questionnaire Package

BACKGROUND INFORMATION

Name: _____   Age: _____

Address: _____

_____

_____

Telephone Number: _____

What is your current marital status? (Check one only)

_____ single (never married)   _____ living with partner

_____ married   _____ separated

_____ divorced   _____ widowed

What is the highest level of education you completed? (Check one only)

_____ High School

_____ College

_____ University

_____ Other (please explain): _____

Are you currently employed? (Check one only)

_____ Yes   Occupation: _____

_____ No

Is your spouse/partner currently employed? (Check one only)

_____ Yes   Occupation: _____

_____ No

Annual Family Income (Circle one only)

| under $10,000 | $10,000 to $20,000 | $20,000 to $30,000 | $30,000 to $40,000 | over $40,000 |

Current Pregnancy

Approximately how many weeks have you been pregnant?

_____

Approximate date when delivery is anticipated?

_____

Are you currently, or do you expect to be, involved
in a child preparation class?

_____ Yes   _____ No

Is your spouse/partner participating in the child
preparation class with you? Or do you anticipate
that your spouse/partner will participate in the
class with you?

_____ Yes   _____ No

Do you have, or do you plan to have, a labour coach,
or a midwife, or some similar individual to help you:

a) through pregnancy?   _____ Yes   _____ No

b) at the time of
   labour or delivery?   _____ Yes   _____ No

If yes, please specify who this person is likely to be:

_____

Have you used this person, or a similar person, in a
previous pregnancy?

_____

Reproductive History

How many children do you have?   _____

How many previous pregnancies have you had?   _____

How many previous miscarriages, abortions,
or stillbirths have you had in total?   _____

Health Behaviours

Do you currently smoke?　　　　　　　_____ Yes　　　　_____ No

　If yes, number of cigarettes a day: _____

Do you currently consume alcohol?　　　　　_____ Yes　　_____ No

　If yes, number of beer (bottles) per week:　　_____

　　　　　　　　　Wine (oz.) per week:　　_____

　　　　　　　　Spirits (oz.) per week:　　_____

Do you currently drink tea or coffee?　　　_____ Yes　　_____ No

　If yes, number of cups per day:　　_____ coffee

　　　　　　　　　　　　　_____ tea

Are you currently involved in any kind of treatment (professional or otherwise) to help you deal with stress?

_____ Yes (If yes, check below)　　　　_____ No

_____ medical

_____ counselling (therapy)

_____ exercise

_____ other, please specify: _____ _____

DIRECTIONS

In the questionnaires that follow, you will find questions about yourself, as well as questions about your relationships with other people during the past month of your pregnancy. Many of the questionnaires that follow are the same as those that you completed during the first half of your pregnancy. Please think about each question and answer carefully, but do not worry if some questions are hard to answer exactly. There are no right or wrong answers. We want you to do your best and answer as honestly as you can.

Thank you for your help.

DIRECTIONS: The questions provided below ask you about your thoughts and feelings during the past month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer each question fairly quickly. That is, don't try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

For each question, circle the number from the following alternatives that best reflects your thoughts and feelings:

1. Never
2. Almost Never
3. Sometimes
4. Fairly Often
5. Very Often

	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly?	1	2	3	4	5
2. In the last month, how often have you felt you were unable to control the important things in your life?	1	2	3	4	5
3. In the last month, how often have you felt nervous and "stressed"?	1	2	3	4	5
4. In the last month, how often have you dealt successfully with irritating life hassles?	1	2	3	4	5
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	1	2	3	4	5
6. In the last month, how often have your felt confident about your ability to handle your personal problems?	1	2	3	4	5
7. In the last month, how often have you felt things were going your way?	1	2	3	4	5

		Never	Almost Never	Sometimes	Fairly Often	Very Often
8.	In the last month, how often have you found that you could not cope with all the things that you had to do?	1	2	3	4	5
9.	In the last month, how often have you been able to control irritations in your life?	1	2	3	4	5
10.	In the last month, how often have you felt that you were on top of things?	1	2	3	4	5
11.	In the last month, how often have you been angered because of things that happened that were outside of your control?	1	2	3	4	5
12.	In the last month, how often have you found yourself thinking about things that you have to accomplish?	1	2	3	4	5
13.	In the last month, how often have you been able to control the way you spend your time?	1	2	3	4	5
14.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	1	2	3	4	5

DIRECTIONS: The statements that follow refer to feelings and experiences which occur to most people at one time or another in their relationship with their spouse or partner. For each statement, there are five possibilities, ranging from "Strongly Disagree" to "Strongly Agree." Read each statement and then circle the number that best reflects your thoughts and feelings regarding your relationship with your spouse or partner during the past month of your pregnancy.

	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
1. My spouse/partner gives me the moral support I need.	1	2	3	4	5
2. I get good ideas about how to do things or make things from my spouse/partner.	1	2	3	4	5
3. Most other people are closer to their spouse/partner than I am.	1	2	3	4	5
4. When I confide in my spouse/partner, I get the idea that it makes him/her feel uncomfortable.	1	2	3	4	5
5. My spouse/partner enjoys hearing about what I think.	1	2	3	4	5
6. My spouse/partner shares many of my interests.	1	2	3	4	5
7. My spouse/partner comes to me when he/she has problems or needs advice.	1	2	3	4	5
8. I rely on my spouse/partner for emotional support.	1	2	3	4	5
9. I can go to my spouse/partner if I was just feeling down, without feeling funny about it later.	1	2	3	4	5
10. My spouse/partner and I are very open about what we think about things.	1	2	3	4	5
11. My spouse/partner is sensitive to my personal needs.	1	2	3	4	5
12. My spouse/partner comes to me for emotional support.	1	2	3	4	5
13. My spouse/partner is good at helping me solve problems.	1	2	3	4	5

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
14.	I have a deep sharing relationship with my spouse/partner.	1	2	3	4	5
15.	My spouse/partner gets good ideas about how to do things or make things from me.	1	2	3	4	5
16.	When I confide in my spouse/partner, it makes me feel uncomfortable.	1	2	3	4	5
17.	My spouse/partner seeks me out for companionship.	1	2	3	4	5
18.	I think my spouse/partner feels that I'm good at helping him/her solve problems.	1	2	3	4	5
19.	I don't have a relationship with my spouse/partner that is as intimate as other people's relationships with their spouses/partners.	1	2	3	4	5
20.	I wish my spouse/partner was much different.	1	2	3	4	5

DIRECTIONS: The statements that follow refer to feelings and experiences which occur to most people at one time or another in their relationships with their families (not including your spouse or partner). For each statement, there are five possibilities, ranging from "Strongly Disagree" to "Strongly Agree." Read each statement carefully and then circle the number that best reflects your thoughts and feelings regarding your relationship with your family during the past month of your pregnancy.

	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
1. My family gives me the moral support I need.	1	2	3	4	5
2. I get good ideas about how to do things or make things from my family.	1	2	3	4	5
3. Most other people are closer to their family than I am.	1	2	3	4	5
4. When I confide in the members of my family who are closest to me, I get the idea that it makes them feel uncomfortable.	1	2	3	4	5
5. My family enjoys hearing about what I think.	1	2	3	4	5
6. Members of my family share many of my interests.	1	2	3	4	5
7. Certain members of my family come to me when they have problems or need advice.	1	2	3	4	5
8. I rely on my family for emotional support.	1	2	3	4	5
9. There is a member of my family I could go to if I was just feeling down, without feeling funny about it later.	1	2	3	4	5
10. My family and I are very open about what we think about things.	1	2	3	4	5
11. My family is sensitive to my personal needs.	1	2	3	4	5
12. Members of my family come to me for emotional support.	1	2	3	4	5
13. Members of my family are good at helping me solve problems.	1	2	3	4	5

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
14.	I have a deep sharing relationship with a number of members of my family.	1	2	3	4	5
15.	Members of my family get good ideas about how to do things or make things from me.	1	2	3	4	5
16.	When I confide in members of my family, it makes me feel uncomfortable.	1	2	3	4	5
17.	Members of my family seek me out for companionship.	1	2	3	4	5
18.	I think my family feels that I'm good at helping them solve problems.	1	2	3	4	5
19.	I don't have a relationship with a member of my family that is a intimate as other people's relationships with family members.	1	2	3	4	5
20.	I wish my family was much different.	1	2	3	4	5

DIRECTIONS: The statements that follow refer to feelings and experiences which occur to most people at one time or another in their relationships with their friends. For each statement, there are five possibilities, ranging from "Strongly Disagree" to "Strongly Agree." Read each statement and then circle the number that best reflects your thoughts and feelings regarding your relationships with your friends during the past month of your pregnancy.

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
1.	My friends give me the moral support I need.	1	2	3	4	5
2.	Most other women are closer to their friends than I am.	1	2	3	4	5
3.	My friends enjoy hearing about what I think.	1	2	3	4	5
4.	My friends come to me when they have problems or need advice.	1	2	3	4	5
5.	I rely on my friends for emotional support.	1	2	3	4	5
6.	If I felt one or more of my friends were upset with me, I'd just keep it to myself.	1	2	3	4	5
7.	I feel that I'm on the fringe in my circle of friends.	1	2	3	4	5
8.	There is a friend I could go to if I was just feeling down, without feeling funny about it later.	1	2	3	4	5
9.	My friends are very open about what we think about things.	1	2	3	4	5
10.	My friends are sensitive to my needs.	1	2	3	4	5
11.	My friends come to me for emotional support.	1	2	3	4	5
12.	My friends are good at helping me solve problems.	1	2	3	4	5
13.	I have a deep, sharing relationship with a number of friends.	1	2	3	4	5

		Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
14.	My friends get good ideas about how to do things or make things from me.	1	2	3	4	5
15.	When I confide in my friends, it makes me feel uncomfortable.	1	2	3	4	5
16.	My friends seek me out for companionship.	1	2	3	4	5
17.	i think my friends feel that I'm good at helping them solve problems.	1	2	3	4	5
18.	I don't have a relationship with a friend that is as intimate as other people's relationships with friends.	1	2	3	4	5
19.	I've recently gotten a good idea about how to do something from a friend.	1	2	3	4	5
20.	I wish my friends were much different.	1	2	3	4	5

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We are interested in your feelings and experiences with different people in your life during the past month of your pregnancy. You will find that several statements refer to a "special person." In these statements, we want you to consider your husband or partner as your special person.

Read each statement carefully. For each statement, circle the number that best reflects how you feel about it.

Circle 1 if you Very Strongly Disagree
2 if you Strongly Disagree
3 if you Mildly Disagree
4 if you are Neutral
5 if you Mildly Agree
6 if you Strongly Agree
7 if you Very Strongly Agree

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
1. There is a special person who is around when I am in need.	1	2	3	4	5	6	7
2. There is a special person with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
3. My family really tries to help me.	1	2	3	4	5	6	7
4. I get the emotional help and support I need from my family.	1	2	3	4	5	6	7
5. I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6. My friends really try to help me.	1	2	3	4	5	6	7
7. I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8. I can talk about my problems with my family.	1	2	3	4	5	6	7
9. I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
10. There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7

		Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
11.	My family is willing to help me make decisions.	1	2	3	4	5	6	7
12.	I can talk about my problems with my friends.	1	2	3	4	5	6	7

	Strongly Disagree	Disagree		Agree	Strongly Agree
Overall, I am satisfied with the support my spouse/partner provided during the past month of my pregnancy	1	2	3	4	5
Overall, I am satisfied with the support my family provided during the past month of my pregnancy	1	2	3	4	5
Overall, I am satisfied with the support my friends provided during the past month of my pregnancy	1	2	3	4	5

We would like to know about the different types of support/assistance you received during the past month of your pregnancy. For the purpose of this questionnaire, there are several types of support we would like you to consider:

Emotional Support	a shoulder to lean on, or help you find comforting or soothing when you felt upset or worried, for example
Practical Assistance	help provided in completing tasks such as help with daily housework, looking after the kids, or running errands, for example
Advice/Guidance	providing you with important or useful information or helpful suggestions, when you have problems or concerns, for example

Overall, which type of support/assistance was most useful to you over the past month of your pregnancy? (check one only)

Emotional Support   _____

Practical Assistance   _____

Advice/Guidance   _____

Appendix I

Zero-order Correlations Between Demographic Variables and
Psychosocial Measures

Table I1: Zero-order correlations between demographic variables and psychosical measures completed in the first half of pregnancy (n=103)

	age	education	income level	smoking	alcoholic beverages	caffeinated beverages
Perceived stress	-0.06	0.05	-0.11	0.14	0.13	-0.05
PSS-Sp	-0.04	-0.10	-0.08	-0.04	-0.21	-0.04
MSPSS-Sp	0.06	-0.11	0.03	-0.02	-0.18	-0.01
PSS-Fa	-0.06	0.03	-0.03	0.06	-0.08	0.03
MSPSS-Fa	0.03	0.01	0.06	-0.05	-0.03	0.03
PSS-Fr	0.11	-0.16	-0.05	0.03	0.02	0.11
MSPSS-Fr	0.13	-0.16	-0.06	-0.11	0.03	0.09
State Anxiety	-0.02	0.07	-0.07	0.16	0.11	-0.13
Depression	-0.10	0.15	-0.21	-0.01	0.07	-0.17

Table 12: Zero-order correlations between demographic variables and psychosocial measures completed in the second half of pregnancy (n=103)

	age	education	income level	smoking	alcoholic beverages	caffeinated beverages
Perceived stress	0.09	0.16	0.17	-0.11	0.17	-0.06
PSS-Sp	-0.01	-0.01	-0.06	-0.02	-0.12	-0.01
MSPSS-Sp	0.01	-0.12	-0.04	-0.09	-0.11	0.07
PSS-Fa	-0.04	-0.01	-0.02	-0.07	-0.05	0.12
MSPSS-Fa	-0.05	-0.01	-0.08	-0.15	-0.08	0.10
PSS-Fr	0.04	-0.11	-0.01	0.06	0.09	0.11
MSPSS-Fr	0.06	-0.07	-0.05	-0.01	-0.01	0.05
State Anxiety	-0.02	0.03	-0.01	-0.09	0.09	-0.04
Depression	0.04	0.02	-0.13	-0.06	0.04	-0.04

Appendix J

Multiple Regression Analyses of State Anxiety on Measures of

Perceived Stress and Support From Spouse, Family, and

Friends

Table J1: Regression of state anxiety (assessed in the second half of pregnancy) on perceived stress and perceived spousal support (PSS-Sp) assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant demographic and baseline psychosocial variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.001395	-0.028865	———
2. Baseline psychosocial vars.	0.177794	0.152878	0.176402
3. Demographic vars. and baseline psychosocial vars.	0.179261	0.127965	0.001467
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Spousal Support (2nd half of preg)	0.588954	0.553972	0.409693
5. Stress X Spousal Support Interaction	0.597049	0.558053	0.008095
		$\underline{F}(1,93)=1.8683$ ns	

[*] Demographic variables are age, education, and income. Baseline psychosocial variables are state anxiety, perceived stress, and perceived spousal support (PSS-Sp) assessed in the first half of pregnancy.

Table J2: Regression of state anxiety (assessed in the second half of pregnancy) on perceived stress and perceived spousal support (MSPSS-Sp) assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant demographic and baseline psychosocial variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.001395	-0.028865	———
2. Baseline psychosocial vars.	0.181644	0.156845	0.170249
3. Demographic vars. and baseline psychosocial vars.	0.183180	0.132129	0.001536
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Spousal Support (2nd half of preg)	0.596833	0.562521	0.413653
5. Stress X Spousal Support Interaction	0.612957	0.575501	0.016121
		$\underline{F}(1,93)=3.8743$ ns	

[*] Demographic variables are age, education, and income. Baseline psychosocial variables are state anxiety, perceived stress, and perceived spousal support (MSPSS-Sp) assessed in the first half of pregnancy.

Table J3: Regression of state anxiety (assessed in the second half of pregnancy) on perceived stress and perceived family support (PSS-Fa) assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant demographic and baseline psychosocial variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.001395	-0.028865	————
2. Baseline psychosocial vars.	0.214504	0.190701	0.213109
3. Demographic vars. and baseline psychosocial vars.	0.215821	0.166810	0.001317
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Family Support (2nd half of preg)	0.586050	0.550820	0.370229
5. Stress X Family Support Interaction	0.590086	0.550417	0.004036
		$\underline{F}(1,93)=0.9157$ ns	

[*] Demographic variables are age, education, and income. Baseline psychosocial variables are state anxiety, perceived stress, and perceived family support (PSS-Fa) assessed in the first half of pregnancy.

Table J4: Regression of state anxiety (assessed in the second half of pregnancy) on perceived stress and perceived family support (MSPSS-Fa) assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant demographic and baseline psychosocial variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.001395	-0.028865	——
2. Baseline psychosocial vars.	0.186809	0.162167	0.185414
3. Demographic vars. and baseline psychosocial vars.	0.188446	0.137724	0.001637
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Family Support (2nd half of preg)	0.585761	0.550507	0.397315
5. Stress X Family Support Interaction	0.586144	0.546093	0.000383

$F(1,93)=0.0861$ ns

[*] Demographic variables are age, education, and income. Baseline psychosocial variables are state anxiety, perceived stress, and perceived family support (MSPSS-Fa) assessed in the first half of pregnancy.

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Table J5: Regression of state anxiety (assessed in the
second half of pregnancy) on perceived stress and perceived
friend support (PSS-Fr) assessed in the second half of
pregnancy, and the perceived stress X perceived friend
support interaction term, with relevant demographic and
baseline variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.001395	-0.028865	———
2. Baseline psychosocial vars.	0.181798	0.157004	0.180395
3. Demographic vars. and baseline psychosocial vars.	0.182871	0.131801	0.001073
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Friend Support (2nd half of preg)	0.591431	0.556659	0.408560
5. Stress X Friend Support Interaction	0.591619	0.552099	0.000188
		$\underline{F}(1,93)=0.0408$ ns	

[*] Demographic variables are age, education, and income.
Baseline psychosocial variables are state anxiety, perceived
stress, and perceived friend support (PSS-Fr) assessed in
the first half of pregnancy.

Table J6: Regression of state anxiety (assessed in the second half of pregnancy) on perceived stress and perceived friend support (MSPSS-Fr) assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant demographic and baseline variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.001395	-0.028865	————
2. Baseline psychosocial vars.	0.178681	0.153793	0.177286
3. Demographic vars. and baseline psychosocial vars.	0.179848	0.128588	0.001167
4. Baseline psychosocial vars., demographic vars., Perceived Stress & Friend Support (2nd half of preg)	0.587672	0.552580	0.407824
5. Stress X Friend Support Interaction	0.587748	0.547852	0.000076
		$F(1,93)=0.0171$ ns	

[*] Demographic variables are age, education, and income. Baseline psychosocial variable are state anxiety, perceived stress, and perceived friend support (MSPSS-Fr) assessed in the first half of pregnancy.

Appendix K

Multiple Regression Analyses of Depression on Measures of

Perceived Stress and Support From Spouse, Family, and

Friends

Table K1: Regression of depression (assessed in the second half of pregnancy) on perceived stress and perceived spousal support (PSS-Sp) assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.031103	0.001743	———
2. Baseline psychosocial vars.	0.282689	0.260952	0.251586
3. Demographic vars. and baseline psychosocial vars.	0.298095	0.254226	0.015406
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Spousal Support (2nd half of preg)	0.557683	0.520039	0.259588
5. Stress X Spousal Support Interaction	0.561676	0.519258	0.003993
		$\underline{F}(1,93)=0.8459$ ns	

[*] Demographic variables are age, education, and income. Baseline psychosocial variables are depression, perceived stress, and perceived spousal support (PSS-Sp) assessed in the first half of pregnancy.

Table K2: Regression of depression (assessed in the second half of pregnancy) on perceived stress and perceived spousal support (MSPSS-Sp) assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant demographic and baseline variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.031103	0.001743	————
2. Baseline psychosocial vars.	0.287619	0.266032	0.256516
3. Demographic vars. and baseline psychosocial vars.	0.301732	0.258090	0.014113
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Spousal Support (2nd half of preg)	0.562876	0.525674	0.261144
5. Stress X Spousal Support Interaction	0.563817	0.521606	0.000941
		$F(1,93)=0.2006$ ns	

[*] Demographic variables are age, education, and income. Baseline psychosocial variable are depression, perceived stress, and perceived spousal support (MSPSS-Sp) assessed in the first half of pregnancy.

Table K3: Regression of depression (assessed in the second half of pregnancy) on perceived stress and perceived family support (PSS-Fa) assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant demographic and baseline variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.031103	0.001743	———
2. Baseline psychosocial vars.	0.299735	0.278514	0.268632
3. Demographic vars. and baseline psychosocial vars.	0.313719	0.270827	0.013984
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Family Support (2nd half of preg)	0.549456	0.511111	0.235737
5. Stress X Family Family Interaction	0.586752	0.546761	0.037296
		$F(1,93)=8.3933, p<.01$	

[*] Demographic variables are age, education, and income. Baseline psychosocial variables are depression, perceived stress, and perceived family support (PSS-Fa) assessed in the first half of pregnancy.

Table K4: Regression of depression (assessed in the second half of pregnancy) on perceived stress and perceived family support (MSPSS-Fa) assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant demographic and baseline variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.031103	0.001743	———
2. Baseline psychosocial vars.	0.294887	0.273520	0.263784
3. Demographic vars. and baseline psychosocial vars.	0.310360	0.267258	0.015473
4. Baseline psychosocial vars., demographic vars., Perceived Stress & Family Support (2nd half of preg)	0.544451	0.505681	0.234091
5. Stress X Family Support Interaction	0.564862	0.522752	0.020411
		$\underline{F}(1,93)=4.3623$, $\underline{p}<.05$	

* Demographic variables are age, education, and income. Baseline psychosocial variables are depression, perceived stress, and perceived family support (MSPSS-Fa) assessed in the first half of pregnancy.

Table K5: Regression of depression (assessed in the second half of pregnancy) on perceived stress and perceived friend support (PSS-Fr) assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant demographic and baseline variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.031103	0.001743	———
2. Baseline psychosocial vars.	0.278560	0.256698	0.247457
3. Demographic vars. and baseline psychosocial vars.	0.292882	0.248687	0.014322
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Friend Support (2nd half of preg)	0.552864	0.514810	0.259982
5. Stress X Friend Support Interaction	0.554570	0.511464	0.001706
		$\underline{F}(1,93)=0.3562$ ns	

[*] Demographic variables are age, education and income. Baseline psychosocial variables are depression, perceived stress, and perceived friend support (PSS-Fr) assessed in the first half of pregnancy.

Table K6: Regression of depression (assessed in the second half of pregnancy) on perceived stress and perceived friend support (MSPSS-Fr) assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant demographic and baseline variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Demographic vars.	0.031103	0.001743	———
2. Baseline psychosocial vars.	0.277754	0.255868	0.246651
3. Demographic vars. and baseline psychosocial vars.	0.292547	0.248331	0.014793
4. Baseline psychosocial vars., demographic vars., Perceived Stress, & Friend Support (2nd half of preg)	0.544673	0.505922	0.252126
5. Stress X Friend Support Interaction	0.550418	0.506910 $F(1,93)=1.1884$ ns	0.005745

* Demographic variables are age, education, and income. Baseline psychosocial variables are depression, perceived stress, and perceived friend support (MSPSS-Fr) assessed in the first half of pregnancy.

Appendix L

Summary of Intrapartum and Neonatal Obstetrical Outcomes

Obstetrical Outcomes for Primipara and Multipara

Given the multiple $\underline{t}$ tests to be performed, Hotelling's $\underline{T}^2$ was conducted first to test the equality of primipara and multipara group means. The results of Hotelling's $\underline{T}^2$ were significant ($\underline{T}^2=39.1464$, $\underline{F}(6,96)=6.2014$, $\underline{p}<.00005$), indicating that primipara (i.e., women who have never been pregnant before, or have never had a pregnancy go beyond 20 weeks gestation) and multipara differed significantly on some of the obstetrical measures. To control for familywise error rate, significance levels for each comparison were set at *alpha*=.008.

Table L1 provides descriptive statistics for intrapartum outcomes. The mean gestation period of the multipara was slightly, though not significantly, longer than the gestation period of the primipara ($\underline{t}(89)=1.35$, ns). The average length of stage 1 labour was significantly longer for primipara than for multipara ($\underline{t}(89)=3.80$, $\underline{p}=.0003$). Similarly, the mean duration of stage 2 labour was significantly longer for primipara than for multipara ($\underline{t}(81)=4.21$, $\underline{p}=.0001$). Stage 1 and stage 2 for *para I* were substantially longer than for *para II*, *para III*, and *para IV*.

Table L1: Descriptive Statistics for Labour (n=92)

Parity		Gest. Age (weeks)	Stage 1 (min.)	Stage 2 (min.)
Para I	Mean	39.15	702.83	112.69
	SD	1.48	505.03	76.27
	n	42	42	36
Para II	Mean	39.32	374.48	56.06
	SD	1.20	292.32	72.58
	n	34	34	32
Para III	Mean	38.42	308.50	21.50
	SD	2.11	174.72	13.89
	n	12	12	12
Para IV	Mean	37.50	422.25	13.67
	SD	1.29	299.94	8.50
	n	4	4	3
Primipara	Mean	39.38	702.83	112.69
	SD	1.38	505.02	76.27
	Range	36-42	120-2280	15-301
	n	42	42	36
Multipara	Mean	38.96	382.80	47.77
	SD	1.55	281.94	64.04
	Range	34-42	60-1637	3-275
	n	50	50	47
Overall	Mean	39.15	530.51	75.93
	SD	1.48	429.33	76.36
	Range	34-42	60-2280	3-301
	n	92	92	83

Para I had a higher rate of surgical deliveries (i.e., forceps, vacuum, or Cesarean section), as well as a lower incidence of spontaneous vaginal deliveries, than *para II*, *para III*, or *para IV* (see Table L2). When examined in terms of primipara and multipara, 30% of the primipara had spontaneous vaginal deliveries in comparison to 70% of the multipara. Sixty-nine per cent of the primipara had doctor-assisted deliveries in contrast to 31% of the multipara.

Descriptive statistics summarizing neonatal outcomes are presented in Table L3. Newborns of primipara did not differ significantly from newborns of multipara in terms of birth weight ($\underline{t}(90)=-1.54$, ns.), apgar scores at 5 minutes ($\underline{t}(90)=-0.74$, ns.), or time to sustain respiration ($\underline{t}(90)=1.11$, ns.).

Few incidences of prolonged labour at stage 1 or stage 2 in the absence of absolute CPD were recorded for primiparous or multiparous women (see Table L4).

Table L2: Mode of Delivery across Parity (n=92)

Parity	Spontaneous Vaginal Delivery	Forceps	Vacuum	Cesarean Section
Para I	n=17	n=13	n=6	n=6
Para II	n=27	n=2	n=3	n=3
Para III	n=9	n=0	n=1	n=1
Para IV	n=3	n=0	n=0	n=1
Overall	n=56	n=15	n=10	n=11

Table L3: Descriptive Statistics for Neonatal Conditions
(n=92)

Parity		Birth Weight (in g)	Apgar Score @ 5 min	Time to Respiration (in sec)
Para I	Mean	3282.60	9.00	12.86
	SD	392.75	0.91	52.23
	n	42	42	42
Para II	Mean	3518.70	9.12	4.41
	SD	369.11	0.54	25.72
	n	34	34	34
Para III	Mean	3225.00	9.00	10.00
	SD	523.75	0.74	23.36
	n	12	12	12
Para IV	Mean	3092.50	9.00	0.00
	SD	504.47	0.00	0.00
	n	4	4	4
Primipara	Mean	3282.60	9.00	12.86
	SD	392.75	0.91	52.23
	Range	2300-44350	5-10	0-300
	n	42	42	42
Multipara	Mean	3414.10	9.08	5.40
	Sd	440.12	0.56	24.01
	Range	2300-4350	8-10	0-150
	n	50	50	50
Overall	Mean	3354.10	9.04	8.80
	SD	442.06	0.74	39.41
	Range	2300-4350	5-10	0-300
	n	92	92	92

Table L4: Labour Complications (n=92)

Blood Pressure Complications

Para I	Para II	Para III	Para IV	Total
n=1	n=0	n=1	n=1	n=3

Cephalopelvic Disproportion

Para I	Para II	Para III	Para IV	Total
n=7	n=2	n=0	n=1	n=10

Prolonged Labour

Stage 1 > 22.9 hours   Stage 1 > 786 minutes
in the absence of CPD   in the absence of CPD

Para I	Para II	Para III	Para IV
n=2	n=0	n=0	n=0

Stage 2 > 105 minutes   Stage 2 > 32 minutes
in the absence of CPD   in the absence of CPD

Para I	Para II	Para III	Para IV
n=10	n=6	n=0	n=0

Table L5: Delivery Complications (n=92)

Preterm Delivery - prior to 37th week of gestation

Para I	Para II	Para III	Para IV	Total
n=2	n=1	n=1	n=1	n=5

Cesarean Section in absence of absolute CPD

Para I	Para II	Para III	Para IV	Total
n=2	n=2	n=0	n=0	n=4

Midforceps or vacuum in absence of absolute CPD

Para I	Para II	Para III	Para IV	Total
n=15	n=5	n=1	n=0	n=21

Table L6: Neonatal Complications (n=92)

Birth weight < 2500g

Para I	Para II	Para III	Para IV	Total
n=2	n=1	n=1	n=0	n=4

Apgar @ 5 minutes < 7

Para I	Para II	Para III	Para IV	Total
n=2	n=0	n=0	n=0	n=2

Time to respiration > 89 seconds

Para I	Para II	Para III	Para IV	Total
n=3	n=2	n=0	n=0	n=5

Abnormalities

Para I	Para II	Para III	Para IV	Total
n=1	n=2	n=0	n=0	n=3

Admission to intensive care nursery

Para I	Para II	Para III	Para IV	Total
n=0	n=1	n=0	n=0	n=1

Appendix M

Zero-order Correlations Between Demographic Variables and Obstetrical Measures

Table M1: Zero-order correlations between demographic variables and obstetrical measures (df=90, except where noted)

	age	education	income level	smoking	alcoholic beverages	caffeinated beverages
gestational age	-0.12	0.02	-0.13	0.09	-0.04	0.01
stage 1 labour	0.02	0.08	0.01	-0.17	0.04	-0.15
stage 2 labour +	-0.13	-0.03	0.02	0.10	-0.10	-0.09
birth weight	-0.02	0.16	-0.08	-0.07	0.02	-0.01
Apgar score @ 5 min	-0.06	-0.13	0.02	0.06	-0.01	0.18
time to respiration	-0.01	-0.03	-0.22	-0.08	-0.04	-0.19
Antepartum Fetal Risk Score						
-1st half of pregnancy	0.29*	0.03	0.07	0.28	-0.03	-0.16
-2nd half of pregnancy	0.30*	0.14	0.14	0.09	-0.05	-0.16

+df=81
alpha=0.001
*p<0.001

Appendix N

(i) Buffering Effects of Social Support on Pregnancy
Complications

(ii) Prediction of Pregnancy Complications

Buffering Effects of Social Support on Pregnancy
Complications

Using the same statistical approach (as described in
the main body of the results section) to test the buffering
effects of social support on pregnancy complications, it was
found that the relationship between the total number of
pregnancy complications and perceived stress varied at
different levels of perceived spousal support, as assessed
by MSPSS-Sp. The initial set of variables produced an R^2 of
.111505 (adjusted R^2=.001814). The inclusion of the
interaction term, PSS X MSPSS-Sp, yielded and an R^2 of
.149942 (adjusted R^2=.033059), which represented a
significant increase of 3.8% in explained variance
($\underline{F}(1,79)=3.5721$, $\underline{p}<.05$).

Women were assigned to either the low or high spousal
support group, as described earlier, and the interaction
effects are presented in Figure N1. The pattern of the
interaction is similar to the ones described before; that
is, under high levels of perceived stress, the total number
of pregnancy complications recorded for women with low
levels of spousal support was greater than the total number
recorded for women with high levels of spouse support. When
stress levels were low, the pattern was reversed; women with
high levels of spousal support experienced a greater total
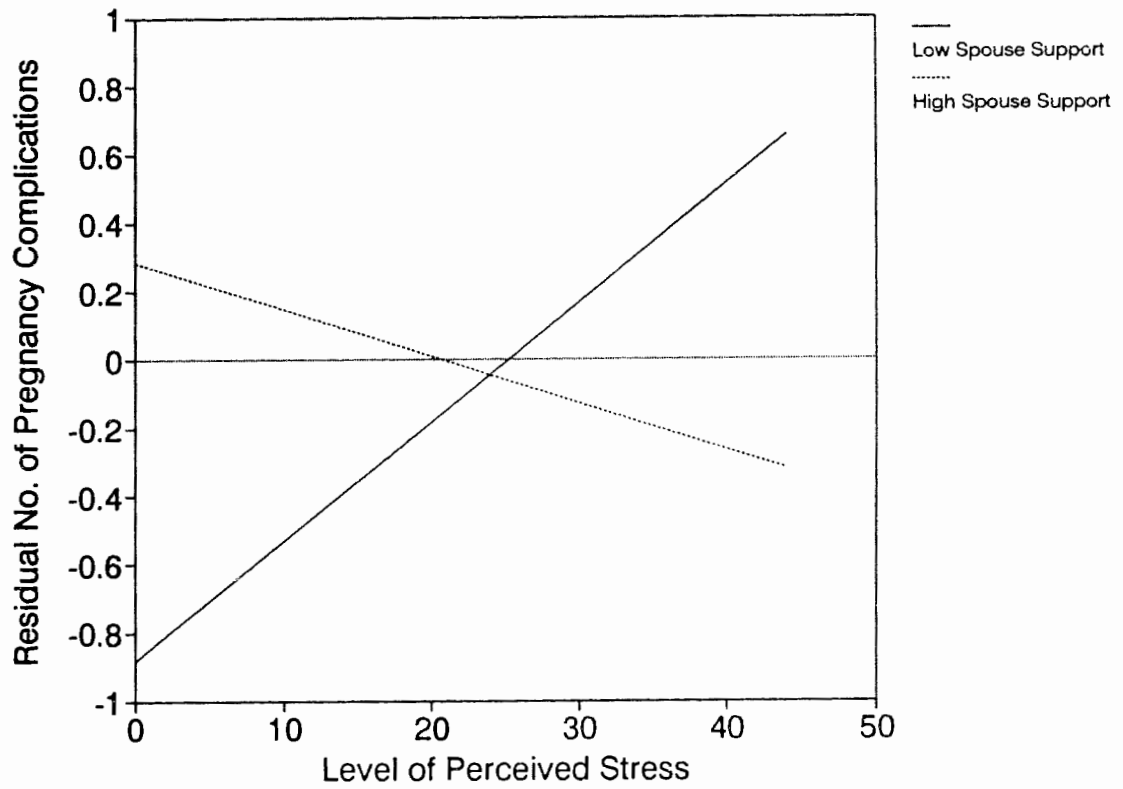
Figure N1: Effects of perceived support from spouse (MSPSS-Sp)
on perceived stress and total number of pregnancy complications

number of pregnancy complications than did women with lower
levels of spouse support.

None of the remaining measures of support buffered the
effects of perceived stress on total number of
complications. Moreover, perceived support from spouse,
family, and friends did not buffer the effects of stress on
intrapartum complications. Summaries of each regression
analysis can be found in Tables N1 through N12.

Prediction of Pregnancy Complications

Factor scores derived from a factor analysis of the
psychosocial variables employed in this research were used
to examine their usefulness in predicting pregnancy
complications. A summary of the factor anaylsis results can
be found beginning on page 120; it is suggested that the
reader review the results of the factor analysis before
preceeding.

None of the six factors, in any combination, were found
to be significant predictors of intrapartum complications
($\underline{F}(1,90)=1.24$, $\underline{p}=.2683$) or total number of pregnancy
complications ($\underline{F}(1,90)=1.87$, $\underline{p}=.1748$). However, factor 1,
perceived family support, factor 2, perceived spousal
support, factor 3, perceived friend support, and factor 5,
maternal distress in the first trimester emerged as

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significant predictors of neonatal complications ($\underline{F}(4,87)=2.96$, $\underline{p}=.0240$), producing an R^2 of .11993 (adjusted $R^2=.07947$). In particular, perceived family support accounted for approximately 2.4% of the explained variance (estimated *Beta*=.0597789), perceived spouse support, about 2.8% of explained variance (estimated *Beta*=-.065265), perceived friend support, roughly 3.5% of explained variance (estimated *Beta*=-.0729476), and maternal distress during the first trimester, about 3.3% of explained variance (estimated *Beta*=.0761046; intercept=.108696). According to this combination of predictors, a greater number of neonatal complications will occur when levels of spouse and friend support are low and levels of family support and maternal distress in the first trimester are high. It should be noted, though, that the amount of explained variance by each predictor is relatively small.

Table N1: Total number of pregnancy complications regressed on perceived stress and perceived spousal support (PSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.104115	0.017765	————
2. Control variables Perceived Stress Spousal Support	0.136320	0.029692	0.032205
3. Stress X Spousal Support Interaction	0.158666	0.042982	0.022346
		$F(1,79)=2.0982$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (PSS-Sp).

Table N2: Total number of pregnancy complications regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.103725	0.017337	————
2. Control variables Perceived Stress Spousal Support	0.111505	0.001814	0.007780
3. Stress X Spousal Support Interaction	0.149942	0.033059	0.038437
		$F(1,79)=3.5721$, $p<.05$	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table N3: Total number of pregnancy complications regressed on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.099689	0.012912	————
2. Control variables Perceived Stress Family Support	0.106172	-0.004177	0.006483
3. Stress X Family Support Interaction	0.117309	-0.004061	0.011137
		$F(1,79)=0.9968$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table N4: Total number of pregnancy complications regressed on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.098460	0.011565	——
2. Control variables Perceived Stress Family Support	0.139511	0.033278	0.041051
3. Stress X Spousal Support Interaction	0.148445	0.031356	0.008934
		$F(1,79)=0.8288$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table N5: Total number of pregnancy complications regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.098390	0.011488	————
2. Control variables Perceived Stress Friend Support	0.108631	-0.002791	0.010241
3. Stress X Friend Support Interaction	0.115617	-0.007525	0.006986
		$\underline{F}(1,79)=0.6240$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

Table N6: Total number of pregnancy complications regressed on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.103266	0.016834	————
2. Control variables Perceived Stress Friend Support	0.112780	0.003247	0.009514
3. Stress X Friend Support Interaction	0.136778	0.018085	0.023998
		$\underline{F}(1,79)=2.1962$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (MSPSS-Fr).

Table N7: Number of intrapartum complications regressed on
perceived stress and perceived spousal support (PSS-Sp),
assessed in the second half of pregnancy, and the perceived
stress X perceived spousal support interaction term, with
relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.088696	-0.000212	————
2. Control variables Perceived Stress Spousal Support	0.113361	0.002531	0.024665
3. Stress X Spousal Support Interaction	0.129576	0.008378	0.016215
		$F(1,79)=1.4717$ ns	

[*] Control variables held constant included antepartum fetal
risk scores, anxiety, and depression variables, assessed in
the first and second half of pregnancy, as well as baseline
measures of perceived stress, and perceived spousal support
(PSS-Sp).

Table N8: Number of intrapartum complications regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.089030	0.000155	————
2. Control variables Perceived Stress Spousal Support	0.104717	-0.007193	0.015687
3. Stress X Spousal Support Interaction	0.124336	0.002408	0.019619
		$\underline{F}(1,79)=1.7700$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table N9: Number of intrapartum complications regressed on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.089619	0.000801	————
2. Control variables Perceived Stress Family Support	0.108893	-0.008877	0.019274
3. Stress X Family Support Interaction	0.118893	-0.003792	0.015672
		$F(1,79)=1.4052$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table N10: Number of intrapartum complications regressed on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.089748	0.000943	———
2. Control variables Perceived Stress Family Support	0.107294	-0.004295	0.017546
3. Stress X Spousal Support Interaction	0.123320	0.001251	0.016026
		$\underline{F}(1,79)=1.4441$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table N11: Number of intrapartum complications regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.093316	0.004859	————
2. Control variables Perceived Stress Friend Support	0.108631	-0.002791	0.015315
3. Stress X Friend Support Interaction	0.115617	-0.007525	0.006986
		$\underline{F}(1,79)=0.6240$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

Table N12: Number of intrapartum complications regressed on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.110555	0.023780	————
2. Control variables Perceived Stress Friend Support	0.129867	0.021101	0.019312
3. Stress X Friend Support Interaction	0.145967	0.039836	0.016100
		$F(1,79)=1.4893$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (MSPSS-Fr).

Appendix O

Multiple Regression Analyses of Gestational Age on Measures of Perceived Stress and Support From Spouse, Family, and Friends

Table 01: Regression of gestational age on perceived stress
and perceived spousal support (PSS-Sp), assessed in the
second half of pregnancy, and the perceived stress X
perceived spousal support interaction term, with relevant
control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.071260	-0.018257	————
2. Control variables Perceived Stress Spousal Support	0.074560	-0.039692	0.003300
3. Stress X Spousal Support Interaction	0.075508	-0.051610	0.000948
		$\underline{F}(1,80)=0.0820$ ns	

[*] Control variables held constant included antepartum fetal
risk scores, anxiety, and depression variables, assessed in
the first and second half of pregnancy, as well as baseline
measures of perceived stress, and perceived spousal support
(PSS-Sp).

Table O2: Regression of gestational age on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.070598	-0.018983	————
2. Control variables Perceived Stress Spousal Support	0.095100	-0.016616	0.024502
3. Stress X Spousal Support Interaction	0.095144	-0.029274	0.000044
		$F(1,80)=0.0039$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table 03: Regression of gestational age on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.071852	-0.017608	———
2. Control variables Perceived Stress Family Support	0.073813	-0.040531	0.001961
3. Stress X Family Support Interaction	0.087458	-0.038016	0.013645
		$\underline{F}(1,80)=1.1962$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table 04: Regression of gestational age on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.087809	-0.000113	——
2. Control variables Perceived Stress Family Support	0.099492	-0.011682	0.011683
3. Stress X Family Support Interaction	0.139583	0.021275	0.040091
		$F(1,80)=3.7276$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table O5: Regression of gestational age on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.070650	-0.018926	————
2. Control variables Perceived Stress Friend Support	0.070832	-0.043880	0.000182
3. Stress X Friend Support Interaction	0.077546	-0.049292	0.006714
		$\underline{F}(1,80)=0.5823$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

Table 06: Regression of gestational age on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.081662	−0.006853	————
2. Control variables Perceived Stress Friend Support	0.084836	−0.028147	0.003174
3. Stress X Friend Support Interaction	0.097630	−0.026446	0.012794
		$F(1,80)=1.1342$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (MSPSS-Fr).

Appendix P

Multiple Regression Analyses of Stage 1 Labour on Measures of Perceived Stress and Support From Spouse, Family, and Friends

Table P1: Length of stage 1 labour regressed on perceived stress and perceived spousal support (PSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.064398	-0.026880	———
2. Control variables Perceived Stress Spousal Support	0.121455	-0.011637	0.057057
3. Stress X Spousal Support Interaction	0.121765	-0.000521	0.000310
		$\underline{F}(1,80)=0.0282$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (PSS-Sp).

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Table P2: Length of stage 1 labour regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.059285	-0.032492	————
2. Control variables Perceived Stress Spousal Support	0.104472	-0.007469	0.045187
3. Stress X Spousal Support Interaction	0.105013	-0.019605	0.000541
		$\underline{F}(1,80)=0.0484$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table P3: Length of stage 1 labour regressed on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.041822	-0.051659	————
2. Control variables Perceived Stress Family Support	0.055969	-0.062035	0.014147
3. Stress X Family Support Interaction	0.057201	-0.074075	0.000541
		$F(1,80)=0.1045$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table P4: Length of stage 1 labour regressed on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.053718	-0.038602	———
2. Control variables Perceived Stress Family Support	0.069972	-0.046281	0.016254
3. Stress X Spousal Support Interaction	0.070809	-0.058572	0.008118
		$F(1,80)=0.7044$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table P5: Length of stage 1 labour regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.049434	-0.043304	————
2. Control variables Perceived Stress Friend Support	0.087766	-0.026264	0.038332
3. Stress X Friend Support Interaction	0.087792	-0.039225	0.000026
		$\underline{F}(1,80)=0.0023$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

Table P6: Length of stage 1 labour regressed on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.048948	-0.043837	———
2. Control variables Perceived Stress Friend Support	0.067745	-0.048787	0.018797
3. Stress X Friend Support Interaction	0.067809	-0.061989	0.000064
		$F(1,80)=0.0055$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (MSPSS-Fr).

Appendix Q

Multiple Regression Analyses of Stage 2 Labour on Measures

of Perceived Stress and Support From Spouse, Family, and

Friends

Table Q1: Length of stage 2 labour regressed on perceived stress and perceived spousal support (PSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.284058	0.195791	———
2. Control variables Perceived Stress Spousal Support	0.286374	0.175812	0.002316
3. Stress X Spousal Support Interaction	0.302345	0.182747	0.015971
		$F(1,70)=1.6025$ ns	

* Control variables held constant included duration of stage 1 labour, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (PSS-Sp).

Table Q2: Length of stage 2 labour regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.287444	0.199595	———
2. Control variables Perceived Stress Spousal Support	0.289404	0.179312	0.001960
3. Stress X Spousal Support Interaction	0.307062	0.188273	0.017658
		$\underline{F}(1,74)=1.7838$ ns	

* Control variables held constant included duration of stage 1 labour, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table Q3: Length of stage 2 labour regressed on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.291442	0.204085	————
2. Control variables Perceived Stress Family Support	0.300534	0.192167	0.009092
3. Stress X Family Support Interaction	0.330910	0.216209	0.030376
		$\underline{F}(1,70)=3.1779$ ns	

[*] Control variables held constant included duration of stage 1 labour, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table Q4: Length of stage 2 labour regressed on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.278567	0.189623	————
2. Control variables Perceived Stress Family Support	0.285122	0.174366	0.006555
3. Stress X Spousal Support Interaction	0.297563	0.177146	0.012441
		$\underline{F}(1,70)=1.2398$ ns	

[*] Control variables held constant included duration of stage 1 labour, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table Q5: Length of stage 2 labour regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.279305	0.190452	———
2. Control variables Perceived Stress Friend Support	0.290153	0.180176	0.010848
3. Stress X Friend Support Interaction	0.292071	0.170712	0.001918
		$F(1,70)=0.1897$ ns	

[*] Control variables held constant included duration of stage 1 labour, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

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Table Q6: Length of stage 2 labour regressed on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.278157	0.189163	———
2. Control variables Perceived Stress Family Support	0.281853	0.170591	0.003696
3. Stress X Family Support Interaction	0.301187	0.181391	0.019334
		$\underline{F}(1,70)=1.9367$ ns	

[*] Control variables held constant included duration of stage 1 labour, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (MSPSS-Fr).

Appendix R

Multiple Regression Analyses of Birthweight on Measures of
Perceived Stress and Support From Spouse, Family, and
Friends

Table R1: Birthweight regressed on perceived stress and perceived spousal support (PSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.327958	0.254198	————
2. Control variables Perceived Stress Spousal Support	0.336011	0.244712	0.008053
3. Stress X Spousal Support Interaction	0.417281	0.328767	0.081270
		$F_{(1,79)}=11.0179$, $p<.01$	

* Control variables held constant included gestational age, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (PSS-Sp).

Table R2: Birthweight regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.304280	0.227920	———
2. Control variables Perceived Stress Spousal Support	0.312923	0.218450	0.008643
3. Stress X Spousal Support Interaction	0.347742	0.248665	0.034819
		$\underline{F}(1,79)=4.2172$, $\underline{p}<.05$	

[*] Control variables held constant included gestational age, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table R3: Birthweight regressed on perceived stress and perceived family support (PSS-Fa). assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.318495	0.243696	———
2. Control variables Perceived Stress Family Support	0.319053	0.225422	0.000558
3. Stress X Family Support Interaction	0.321660	0.218623	0.002607
		$F(1,79)=0.3036$ ns	

* Control variables held constant included gestational age, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table R4: Birthweight regressed on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.306033	0.229866	————
2. Control variables Perceived Stress Family Support	0.315145	0.220977	0.009112
3. Stress X Family Support Interaction	0.340179	0.239953	0.025034
		$F(1,79)=2.9973$ ns	

* Control variables held constant included gestational age, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table R5: Birthweight regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.304276	0.227916	———
2. Control variables Perceived Stress Friend Support	0.353510	0.264618	0.049234
3. Stress X Friend Support Interaction	0.423094	0.335463	0.069584
		$F(1,79)=9.5286$, $p<.01$	

* Control variables held constant included gestational age, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived friend support (PSS-Fr).

Table R6: Birthweight regressed on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.304704	0.228391	————
2. Control variables Perceived Stress Friend Support	0.304954	0.209385	0.000250
3. Stress X Friend Support Interaction	0.409849	0.320206	0.104895
		$F(1,79)=14.0417$, $p<.01$	

[*] Control variables held constant included gestational age, antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fr).

Appendix S

Multiple Regression Analyses of 5 Minute Apgar Scores on

Measures of Perceived Stress and Support From Spouse,

Family, and Friends

Table S1: Apgar score at 5 minutes regressed on perceived stress and perceived spousal support (PSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.173859	0.094231	———
2. Control variables Perceived Stress Spousal Support	0.182202	0.081239	0.008343
3. Stress X Spousal Support Interaction	0.182670	0.070287	0.000468
		$\underline{F}(1,80)=0.0458$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (PSS-Sp).

Table S2: Apgar score at 5 minutes regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.179400	0.100306	————
2. Control variables Perceived Stress Spousal Support	0.182904	0.082028	0.003504
3. Stress X Spousal Support Interaction	0.202895	0.093293	0.019991
		$\underline{F}(1,80)=2.0064$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table S3: Apgar score at 5 minutes regressed on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.177215	0.097911	————
2. Control variables Perceived Stress Family Support	0.229394	0.134257	0.052179
3. Stress X Family Support Interaction	0.229579	0.123646	0.000185
		$\underline{F}(1,80)=0.0192$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table S4: Apgar scores at 5 minutes regressed on perceived
stress and perceived family support (MSPSS-Fa), assessed in
the second half of pregnancy, and the perceived stress X
perceived family support interaction term, with relevant
control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.174218	0.094625	————
2. Control variables Perceived Stress Family Support	0.216582	0.119863	0.042364
3. Stress X Family Support Interaction	0.216905	0.109229	0.000323
		$\underline{F}(1,80)=0.0330$ ns	

[*] Control variables held constant included antepartum fetal
risk scores, anxiety, and depression variables, assessed in
the first and second half of pregnancy, as well as baseline
measures of perceived stress, and perceived family support
(MSPSS-Fa).

Table S5: Apgar score at 5 minutes regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables* held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.168589	0.088453	————
2. Control variables Perceived Stress Friend Support	0.172515	0.070356	0.003926
3. Stress X Friend Support Interaction	0.175536	0.062172	0.003021
		$\underline{F}(1,80)=0.2931$ ns	

* Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

Table S6: Apgar score at 5 minutes regressed on perceived
stress and perceived support from friends (MSPSS-Fr),
assessed in the second half of pregnancy, and the perceived
stress X perceived friend support interaction term, with
relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.171912	0.092097	————
2. Control variables Perceived Stress Friend Support	0.186251	0.085788	0.014339
3. Stress X Friend Support Interaction	0.192446	0.081407	0.006195
		$\underline{F}(1,80)=0.6137$ ns	

[*] Control variables held constant included antepartum fetal
risk scores, anxiety, and depression, assessed in the first
and second half of pregnancy, as well as baseline measures
of perceived stress, and perceived support from friends
(MSPSS-Fr).

Appendix T

Multiple Regression Analyses of Time to Sustain Respiration

on Measures of Perceived Stress and Support From Spouse,

Family, and Friends

Table T1: Time for the newborn to sustain respiration regressed on perceived stress and perceived spousal support (PSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.099384	0.012577	————
2. Control variables Perceived Stress Spousal Support	0.141027	0.034980	0.041643
3. Stress X Spousal Support Interaction	0.141053	0.022948	0.000026
		$\underline{F}(1,80)=0.0024$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (PSS-Sp).

Table T2: Time to for the newborn to sustain respiration regressed on perceived stress and perceived spousal support (MSPSS-Sp), assessed in the second half of pregnancy, and the perceived stress X perceived spousal support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.097500	0.010513	————
2. Control variables Perceived Stress Spousal Support	0.114209	0.004852	0.016709
3. Stress X Spousal Support Interaction	0.115338	0.006301	0.001129
		$\underline{F}(1,80)=0.1021$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived spousal support (MSPSS-Sp).

Table T3: Time for the newborn to sustain respiration regressed on perceived stress and perceived family support (PSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.104905	0.018631	———
2. Control variables Perceived Stress Family Support	0.126889	0.019098	0.021984
3. Stress X Family Support Interaction	0.126913	0.006863	0.000024
		$\underline{F}(1,80)=0.0022$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (PSS-Fa).

Table T4: Time for the newborn to sustain respiration regressed on perceived stress and perceived family support (MSPSS-Fa), assessed in the second half of pregnancy, and the perceived stress X perceived family support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.113198	0.027724	————
2. Control variables Perceived Stress Family Support	0.140087	0.033924	0.026889
3. Stress X Spousal Support Interaction	0.141192	0.023106	0.001105
		$\underline{F}(1,80)=0.1029$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived family support (MSPSS-Fa).

Table T5: Time for the newborn to sustain respiration regressed on perceived stress and perceived support from friends (PSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.085259	-0.002909	————
2. Control variables Perceived Stress Friend Support	0.085451	-0.027456	0.000192
3. Stress X Friend Support Interaction	0.085816	-0.039888	0.000365
		$\underline{F}(1,80)=0.0319$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (PSS-Fr).

Table T6: Time for the newborn to sustain respiration regressed on perceived stress and perceived support from friends (MSPSS-Fr), assessed in the second half of pregnancy, and the perceived stress X perceived friend support interaction term, with relevant control variables[*] held constant

	R^2	adjusted R^2	R^2 increment
1. Control variables	0.083056	-0.005324	————
2. Control variables Perceived Stress Friend Support	0.088460	-0.024076	0.001137
3. Stress X Friend Support Interaction	0.089279	-0.035945	0.000819
		$\underline{F}(1,80)=0.0719$ ns	

[*] Control variables held constant included antepartum fetal risk scores, anxiety, and depression variables, assessed in the first and second half of pregnancy, as well as baseline measures of perceived stress, and perceived support from friends (MSPSS-Fr).

Appendix U

Satisfaction With Perceived Level of Support From Spouse,

Family, and Friends

Satisfaction with Support

Comparison of support satisfaction among the different sources during the first and second half of pregnancy was first evaluated using Hotelling's T^2. Results of Hotelling's T^2 analysis were significant, (T^2=22.3962, $F(5,98)$=4.3036, p=.0014), indicating that there were significant differences regarding satisfaction with support from spouse, family, and friends during the first and second half of pregnancy. With significance levels for each comparison set at *alpha*=.006 to control for the familywise error rate, follow-up t tests revealed there to be significant differences on 2 of the 9 comparisons. Satisfaction with support from friends decreased significantly from the first half of pregnancy to the second half ($\underline{t}$(102)=2.21, p=.0059), whereas satisfaction with support from spouse, and from family, remained relatively unchanged from the first to the second half of pregnancy (see Table U1). Table U2 presents $\underline{t}$ tests comparing satisfaction with support from spouse, family, and friends in the first half and second half of pregnancy. From Table U2, it can be seen that women were significantly more satisfied with the support they received from their spouse than from their family during the second half of pregnancy ($\underline{t}$(102)=2.87, p=.0049).

Table U2: Matched t tests comparing satisfaction with support from different sources during the first half of pregnancy and during the second half of pregnancy (df=102)

	t		
First Half of Pregnancy			
Spouse vs Family	2.32	p=.0224	ns
Spouse vs Friend	0.81	p=.4197	ns
Family vs Friend	-1.89	p=.0622	ns
Second Half of Pregnancy			
Spouse vs Family	2.87	p=.0049	
Spouse vs Friend	1.22	p=.2239	ns
Family vs Friend	-1.81	p=.0726	ns

alpha=.006

Appendix V

Types and Sources of Support Most Useful During Pregnancy

Type and sources of support most useful during pregnancy

With regard to emotional support, 76% (n=57) of the
women indicated that their spouse/partner was their most
important source of emotional support throughout their
pregnancy; 15% (n=11) reported a family member to be their
most important source of emotional support; and 9% (n=5)
indicated that a friend was their most important source of
emotional support. In many instances, the women indicated
that this individual's availability/accessibility, intimacy,
empathy, and understanding, made the emotional support from
this person more important to them than emotional support
from others. Additionally, some indicated that these
elements helped them to maintain emotional stability such
that they were able to cope better with their daily
activities and difficulties.

In terms of practical support, 69% (n=52) reported
their spouse/partner to be their most important source of
practical, 20% (n=15), a family member, and 7% (n=5), some
other individual, usually a nanny. Three individuals did
not complete this section. In most instances, practical
support from their nominated individual was most important
because of their availability and accessibility, as well as
their willingness to help with daily household activities.

With respect to informational support, 15% (n=11) of
the women indicated that their spouse/partner was their most

important source of informational support, 23% (n=17), a family member, usually a mother or sister, 9% (n=7), a female friend, 44% (n=33), their obstetrician, and 4% (n=3), some other health professional. Most women believed that their obstetrician was their most important source of advice/guidance because of their experience, knowledge, and expertise; this was particularly true for primiparous women who found that the information provided by the obstetrician helped to allay worries and fears about their pregnancy.

Overall, 45% (n=34) of the women felt that emotional support was the most important type of support during their pregnancy, 40% (n=30), believed practical support to be the most important type of support, and 15% (n=11) reported informational support to be most important throughout their pregnancy. A different pattern emerges though when type of support is considered in terms of parity. For multipara, 64% (n=27) felt practical support to be the most important type of support during pregnancy. The most frequent reason multiparous women gave for rating practical support as the most important type of support was that they often felt overwhelmed with daily activities which, unlike primiparous women, included care of other children. The provision of practical support provided them with relief from the stress of their daily activities, and allowed them time to rest and unwind. Another 26% (n=11) of multiparous women believed emotional support to be the most important type of support,

often because it helped to maintain emotional stability. Sixty-four per cent (n=27) of multiparous women believed informational support to be least important during their pregnancy because, owing to their previous pregnancy, or pregnancies, their current pregnancy was not a new experience, and they knew what to expect. In contrast, 70% (n=23) of the primipara felt emotional support was most important because it conveyed reassurance, understanding, and acceptance, particularly regarding their changing mood states, which increased their sense of well-being: when they felt better, they felt better able to cope with the daily activities. Twenty-one per cent (n=7) of the primipara rated informational support as most important because the pregnancy, being their first one, was a new experience, and information help to allay their fears and concerns regarding the pregnancy. Finally, 70% (n=23) of primiparous women believed practical support to be the least important support for them during their pregnancy because they generally felt able to meet the demands of their daily activities.