1988

Socio-environmental Factors Associated With Length Of Gestation And Infant Birth Weight Among A Teenage Sample

Sandra Elizabeth Nuttall

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SOCIO-ENVIRONMENTAL FACTORS ASSOCIATED WITH LENGTH OF GESTATION AND INFANT BIRTH WEIGHT AMONG A TEENAGE SAMPLE

by
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Submitted in partial fulfillment
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Doctor of Philosophy

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London, Ontario
April, 1988

ISBN 0-315-40785-9

ABSTRACT

Infant birth weight and length of gestation are associated with a variety of health outcomes for the infant. Birth weight, in particular, is most closely associated with neonatal and postneonatal mortality. Birth weight has also been associated with a number of other health consequences including speech difficulties, mental retardation and increased use of health services. Birth weight has become a central focus in research committed to improving infant health. This research has yielded important indications of the significance of the social environment for pregnancy outcomes.

The present study was designed to consider some promising socio-environmental factors and their relationship to length of gestation and infant birth weight. These factors included social stressors, supportive relationships and the variables of self esteem and personal competence. As well, this study examined the extent to which those socio-environmental factors might intervene in the relationship of maternal age and marital status with length of gestation and infant birth weight.

The study group consisted of 204 women aged 19 years or less at conception. Participants were referred to the study from the caseload of physicians in Middlesex and Elgin Counties. Two additional sources were also drawn upon; public health nurses and a newspaper advertisement. Each participant completed two questonnaires administered by an interviewer. Due to circumstances surrounding the pregnancy, self-administered questionnaires were necessary in a few cases. The questionnaires were administered at two points in time. The first interview took place as soon as possible after the confirmation of pregnancy and the second occurred six weeks after delivery. Information was also abstracted from the hospital chart of the mother and the infant.

The relationships of the various measures with the study outcomes were examined using multiple regression analysis. The study findings showed that maternal age and marital status influenced infant birth weight only through their association with prenatal care, weight gain and alcohol consumption. It was also found that weight gain, prenatal care, and alcohol consumption were related to infant birth weight directly and indirectly through length of gestation.

The variables of social support and personal resources were not related to length of gestation or infant birth weight. However, some suggestive evidence of a possible relationship between life event stress and infant birth weight was revealed.

Given the prospective, longitudinal nature of the study design certain causal inferences are possible. The variables of prenatal care, weight gain and alcohol consumption appear to be promising targets for future investigations. Further explorations of these variables may reveal the causal mechanisms whereby these factors exert an influence on length of gestation and birth weight.

ACKNOWLEDGEMENTS

This work is dedicated to the loving memory of my father who was here for the beginning but could not stay until the end. However, I know that he is very proud. I also wish to acknowledge the constant support and encouragement of my mother, who's patients and good nature did much to sustain me over the course of my work. I would also like to take this opportunity to acknowledge the constant support and encouragement of Sandra Haynes. She suffered through the many revisions of this dissertation with much patience and thoughtful criticism. Her constant companionship gave me the courage to continue particularly when success seemed so far away.

I would also like to take this opportunity to thank my supervisor, Dr. Carol Buck. Her thorough review of each manuscript and her thoughtful criticisms were very much appreciated. I would also like to thank Dr. R. Jay Turner and the staff of the Health Care Research Unit, at the University of Western Ontario for all their support and assistance with the implementation of this study.

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CHAPTER 1.0

INTRODUCTION AND GENERAL OBJECTIVES

This study examines the relationship between selected socio-environmental factors and both length of gestation and infant birth weight among a sample of primiparous women less than twenty years old. Birth weight is recognized as a crucial variable causally implicated in neonatal and postneonatal mortality as well as in neurodevelopmental problems in the infant (Drillien, 1972; Rubin et al., 1973; Pharoah, 1976; Reed and Stanley, 1977; Shapiro et al., 1980; Carey et al., 1981; Laurence and Merritt, 1991; U.S. Department of Health and Human Services, 1980; McCormick, 1985).

Infant birth weight is most closely associated with neonatal mortality. Risk of mortality is lowest among infants weighing from 3000 to 3500 grams at birth. As birth weight declines, the relative risk of mortality increases. At birth weights of 2500 grams or less, the increase in the relative risk of mortality is rapid. Infants in this birth weight category are 40 times more likely to die than are infants weighing more than 2500 grams. For infants weighing 1000 grams or less, the relative risk of mortality is 200 times that of infants weighing more than 2500 grams.

Birth weight is also closely associated with risk of mortality in the postneonatal period. Infants weighing less than 2500 grams are five times more likely to die than infants weighing more than 2500 grams.

The possible influence of birth weight for subsequent morbidity remains an important focus of research. Although all the evidence is not yet in, investigators in this area report important associations between infant birth weight and speech difficulties, decreased reading ability (Butler and Alberman, 1969; Rubin et al., 1973), mental retardation, cerebral palsy (Burst, 1979), increased use of health resources and disrupted family functioning (Benedict and White, 1985; McCormick, 1985).

Within birth weight groups, the risk of mortality is not uniform but varies with gestational age. In general, as duration of gestation increases up to 42 weeks, the likelihood of neonatal death decreases. Studies of the relative influence of both factors report birth weight to be the dominant variable (McCormick, 1985).

The National Institute of Medicine in the United States has recommended that new efforts be made, on all fronts, to reduce infant mortality through a concerted

effort to improve infant weight at birth (The Nation's Health, March, 1985; McCormick, 1985).. In addition to reduced mortality, subsequent improvements in the long term health of infants may be achieved through a focus on gestation and infant birth weight.

Much research has accumulated pointing to the importance of the social environment in pregnancy outcomes (Cassel, 1976; Reed and Stanley, 1977; World Health Statistics Quarterly, 1978; Cohen and Syme, 1985). The role and significance of such factors as maternal age, marital status, prenatal care, weight gain, cigarette smoking and alcohol consumption for length of gestation and infant birth weight have been examined in this research. While these factors have shown an association with pregnancy outcomes, they do not account for all the variation observed in length of gestation and infant birth weight. The present study introduces new socio-environmental factors to be considered together with the already known correlates of pregnancy outcomes.

Among the new variables considered were the influence of socially supportive relationships, particularly support from parents, friends and from the father of the baby. The extent to which factors such as stressful life events, pregnancy related stress and financial stress influence

length of gestation and infant birth weight were also examined. Along with the social resources of supportive relationships, the role of personal resources such as personal competence and self esteem were considered.

There can be little doubt that social factors play an important role in physical and emotional health and well-being (Nuckolls et al., 1972; Dott and Forte, 1975; Stickle and Ma, 1975; 1977; Berkman and Syme, 1979; Broadhead et al., 1983; Norbeck and Tilden, 1983; Turner et al., 1983; Anderson et al., 1984; Dunn, 1984; Zuckerman et al., 1984; Geronimous, 1986). Although pregnancy is not an illness, it is a health event with the potential for unfavourable outcomes, both for the mother and the fetus/neonate.

Therefore, a major objective of this study was to examine selected socio-environmental factors, noted above, and the extent to which these factors were associated with variations in length of gestation and infant birth weight. A secondary objective of this study was to examine the extent to which the socio-environmental factors, selected for study, might intervene in the relationship between maternal age and marital status with length of gestation and infant birth weight.

CHAPTER 2.0

THE ROLE OF MATERNAL AGE IN LENGTH OF GESTATION AND INFANT BIRTH WEIGHT

2.1 Introduction

As noted earlier, gestational age and birth weight are closely associated with infant morbidity and mortality. While these outcomes and their determinants warrant research attention across all maternal age groups, the sample for this study consists of women who were less than 20 years old at conception. This section will outline the rationale for a focus upon this particular age group.

2.2 Adolescent Fertility

A focus upon the adolescent parturient arises from two important considerations. First, although the adolescent fertility rate in Canada has declined by 2.9 percent from 1984 to 1985, the absolute number of live births remained substantial. There were approximately 22,276 live births among Canadian teenagers in 1985 (Statistics Canada, Table 13:21, 1985). While the teenage fertility rate for Canada had declined, regional variations were evident. The provinces of Quebec and New Brunswick have shown an increase of 1.4 and 1.3 percent, respectively from 1984 to 1985 (Statistics Canada, 1985).

Accompanying the overall decline in the fertility rate among teenage women has been a reduction in the proportion of births to this age group. Approximately 6 percent of all live births in 1985 were to teenagers. This percentage has declined from almost 8 percent of all live births in 1971. In absolute numbers, it represents 22,276 live births to Canadian adolescents in 1985 (Statistics Canada, 1982; 1985). The absolute number of live births, coupled with important regional variations in fertility suggest that adolescent women remain an important segment of the childbearing population and as such warrant research attention.

2.3 Maternal Age as a Factor in Reproductive Outcomes

A second and equally important consideration arises from the potential relevance of findings from this subgroup for other maternal ages. Historically, the research literature has pursued a biological/physiological constraint hypothesis of reproductive potential among pregnant adolescents. This focus began to shift in the late 1970's as research findings failed to support maternal age as a significant and independent risk factor in suboptimal reproductive outcomes.

Garn and Petzold (1983) using data from the National Collaborative Perinatal Project, attempted to determine whether maternal age, restricted body mass or physiologic immaturity were related to adverse fetal outcomes. The sample consisted of 11,464 women less than 20 years old and a comparison group of 28,477 women aged 20 to 29 years. Their data confirmed the expected association of increased birth weight with increased maternal age. However, the relationship of age to infant birth weight was not significant when pregravid weight was introduced into analysis. The authors concluded that pregravid weight appeared to be a key variable in the relationship of maternal age and adverse fetal outcomes rather than age or developmental maturity.

Investigators have generally speculated that much of the effect of young maternal age on pregnancy outcomes might be explained by a competition for nutrients between the developing mother and the growing fetus. An outcome likely to be sensitive to this possibility is the small-for-gestational age birth. Elster (1984) used data available from approximately 34,000 computerized records of mothers with singleton births in Utah from 1974 to 1979. Log linear analysis was used to determine the relative influence of maternal age (five categories, 12-14; 15-16; 17-18; 19; 25-29) parity, interpregnancy

interval and prenatal care (measured as trimester when care was initiated) on risk of delivering a small-for-gestational age (SGA) infant. Elster found that the risk of having an SGA baby was significantly related to late prenatal care and young maternal age (12-14 only). However, when the interaction of maternal age and prenatal care was further evaluated, the risk of having an SGA infant among very young teens (12-14) who began prenatal care early (1st trimester) did not differ significantly from older teens or adults. Elster concluded that for primiparous women, prenatal care was an important variable mediating the relationship between decreased maternal age and increased risk of having a small-for-gestational age infant.

In addition to large population based studies of the kind just reviewed, a number of smaller studies using hospital patients and/or obstetric records have reported a non-significant relationship between young maternal age and adverse fetal outcome when other factors were taken into account (Graham, 1981; Osbourne et al., 1981; Horon et al., 1983; Zuckerman et al., 1984).

2.4 Conclusion

The relevance of the present study may be viewed from two perspectives. First, despite recent declines in fertility, women less than twenty years old remain an important segment of the childbearing population. However, little information is available on the nature and characteristics of pregnancy and its outcome among a Canadian sample. Much of the available research has been conducted on American samples with race and socio-economic status not controlled.

Secondly, the few studies just reviewed are representative of a larger body of research literature pointing to maternal age as a marker for social rather than biological disadvantage (Morris, 1981). Given the mounting evidence strongly suggesting that physiologic immaturity is not an explanatory factor in adolescent reproductive outcomes, findings from this study may have relevance for all childbearing women. Thus, teenage mothers form a promising group in which to further examine the role and significance of the social environment and its influence on length of gestation and infant weight at birth.

CHAPTER 3.0

FACTORS ASSOCIATED WITH LENGTH OF GESTATION AND INFANT BIRTH WEIGHT

Several factors, originating preconceptually as well as those arising over the pregnancy have been shown to be associated with infant birth weight and/or length of gestation. These factors include: maternal age (Niswander and Gordon, 1972; McCormick et al., 1984); marital status (World Health Statistics Quarterly, 1978); social class (Baird, 1977; Ounsted and Scott, 1982; Dunn, 1984); race (Niswander and Gordon, 1972); maternal height (Butler and Bonham, 1963; Ontario Department of Health, 1967); maternal education (Hardy and Mellits, 1977); geographic location (Boldman and Reed, 1977); smoking (Butler and Bonham, 1963; Meyer, 1977; Anderson et al., 1984); alcohol use (Vitez, 1984); pregravid weight and weight gain over the pregnancy course (Niswander and Gordon, 1972; Anderson et al., 1984). Although maternal health conditions such as heart disease, diabetes and renal disease hold severe implications for both mother and fetus, the incidence of these conditions is generally very low within a young obstetric population (ie. Grindstaff and Riordan, 1983). Additional factors arising primarily over the antepartum

period include: pregnancy-induced hypertension and its more severe forms, pre-eclampsia and eclampsia (Aznar and Bennett, 1960; Zackler et al., 1969; Grant and Heald, 1972; Clark et al., 1982; Hutchins et al., 1979; Carey et al., 1981); anemia (Edwards et al., 1979); maternal infections, particularly bladder-urinary tract infections (Sev[illegible] et al., 1977); antepartum hemorrhage including vaginal bleeding of the first and third trimester and bleeding related to abnormal placental implantation (Niswander and Gordon, 1972); inadequate prenatal care (Butler and Bonham, 1963; Dott and Fort, 1975); and prior reproductive experience (Niswander and Gordon, 1972; Berkowitz, 1981; Hoffman and Bakketeig, 1984).

Although research efforts have long recognized the influence of the social environment (ie. social class) for pregnancy outcomes among women generally, the role and significance of such factors has only recently become a focus of research attention (Gorsuch and Key, 1974; McAnarney and Theide, 1981; Dunn, 1984; McCormick et al., 1984; Ounsted and Scott, 1982). Chase (1972) used information gathered from a review of state vital statistics registries for 142,000 liye births and approximately 3,000 linked infant death records to form two broad categories of pregnancy risk: socio-demographic and medical-obstetric. For women with some risk factors

from both categories, infant mortality rates of 41.6 per 1000 live births were reported. These rates were more than three times greater than the mortality rates for infants of women with no risk factors recorded (11.6/1000).

Stickle and Ma (1975) reported infant mortality to be slightly lower for adolescent women with social risk factors only compared to the rates for infants of women at medical risk only. As Stickle and Ma (1975) and others have pointed out, adolescents may be particularly vulnerable to the influence of certain social risks for adverse pregnancy outcomes (Dwyer, 1974; Carey et al., 1981; Morris, 1981; Dunn, 1984; McCormick et al., 1984).

A review of the literature on adolescent pregnancy suggests the possibility of links between adverse pregnancy outcomes and socio-demographic or lifestyle factors. The research efforts of both Chase (1972) and Stickle and Ma (1975) are particularly noteworthy for their attention to the influence of both the social and clinical factors for infant mortality. This investigation considers the independent and the combined influence of selected socio-environmental and physical health factors as well as the relationships among these variables for the study outcomes.

CHAPTER 4.0

SOCIO-ENVIRONMENTAL FACTORS AND THEIR ASSOCIATION WITH LENGTH OF GESTATION AND INFANT BIRTH WEIGHT

4.1 Introduction

In his seminal lecture, Cassel (1976) argued persuasively for attention to the etiologic significance of the social environment for both physical and psychological health. Recent reviews by Kiritz and Moos (1974), Cobb (1976), Mueller (1980), Dimatteo and Hayes (1981), Broadhead et al. (1983), Turner and Noh (1983), and Cohen and Syme (1985) among others have brought together considerable evidence bearing upon the contribution of the social environment, including supportive relationships for illness susceptibility across a wide array of health events.

The notion that the social environment generally and supportive circumstances in particular, contribute importantly to physical and mental health has a long and rich history (Berle et al., 1952; Egbert et al., 1964; Lowenthal and Haven, 1968; Nuckolls et al., 1972; MacKinley, 1973; Brown et al., 1975; Myers et al., 1975; Weisman and Wordon, 1976; Caplan and Killilea, 1976; Henderson, 1977; Kaplan et al., 1977; Langlie, 1977;

Lynch, 1977; Walker et al., 1977; Gore, 1978; Berkman and Syme, 1979; Barrera, .1981; Davidson, 1981; Blazer, 1982; Norbeck and Tilden, 1983; Hall et al., 1985). It was the intention of this study to contribute further to our understanding of the ways in which the social environment may influence susceptibility to illness. Although not an illness, pregnancy is a health event that carries with it a differential probability of adverse outcomes both for the mother and the fetus/neonate.

4.2 The Social Environment

Definitions of the social environment differ across disciplines. However, a common theme which emphasizes both the properties and processes of the individual's social system is clearly evident. In this research, two aspects of the social environment were considered. The first aspect was the personal environment, primarily consisting of those personal properties or resources an individual may bring to bear in defense of his/her own sense of personal well-being. The second aspect was one of social processes and focuses upon the individual's relationships with others. This aspect of the social environment was particularly concerned with the social-psychological or perceptual content of supportive relationships.

4.2.1 Personal Resources

The potential influence of an individual's personal resources on pregnancy outcomes has not been fully explored in the literature on pregnancy. However, personal resources, variously defined are thought to be of substantial relevance for both physical and emotional well-being (Pearlin and Schooler, 1978; Turk 1979; Pearlin et al., 1981) and may therefore be of importance for the course and outcome of pregnancy. Baird (1964) was among the first to suggest that a woman's reproductive efficacy may be influenced by her environment from her birth through her childbearing years. Taking this hypothesis one step further, it may be that in addition to considerations of nutritional status and physical development over this period, certain aspects of a woman's psycho-social or personal development also figure importantly in reproductive efficacy. In this study two specific elements in one's store of personal resources have been considered. The first aspect was a sense of personal competence, that is the individual's own assessment of the degree to which she is as successful and as capable as most others. The second aspect was self esteem or a positive self-regard, that is the extent to which an individual feels as worthy as most others.

4.2.2 Personal Competence

Personal competence, or what Smith (1968) called social competence, includes the ability to interact effectively with one's social environment. Although various definitions and measures of this concept have been employed, common to most is a grounding in developmental theories (Vance, 1973; Turner and Gartrell, 1978). Central to the notion of competence is the individual's perception of self as causally important. That is, the personal belief that outcomes are affected by one's actions. The formation of personal competence is achieved through the experience of repeated success at managing various life tasks. As such, it may be viewed as an acquired attribute that resides within the individual and that reflects varying levels of maturity and/or life experience.

For the purpose of this research, personal competence was defined as the extent to which an individual feels personally able to manage central life tasks (ie. managing money). It was viewed as a resource, likely to influence an individual's overall sense of well-being. Given the important association between mental and physical health, it was hypothesized that personal competence may play a role in pregnancy outcomes. That is to say, the extent to which one feels personally capable of managing important

tasks may influence study outcomes through some as yet unidentified mechanism. A discussion of the measurement of personal competence is found in Section Six.

4.2.3 Self Esteem

Rosenberg (1979:23) has suggested that self esteem is essentially "... something that emerges and develops gradually, primarily out of social experience". Self esteem may be viewed as an important part of one's store of personal resources influencing individual perceptions of personal worth, attitudes and behaviours. The potential influence of self esteem for physical and emotional health outcomes has recently become the subject of much research attention (Parker, 1980; Patten, 1981; Pearlin et al., 1981; Litt et al., 1982; Petrie and Rotherman, 1982). The influence of self esteem has been examined across a broad array of research concerns ranging from nutrition and weight control through smoking cessation and substance abuse to research involving stress, anxiety, depression and medical compliance in chronic illness. Although the research topics have been diverse, the reported findings have been consistent in identifying self esteem as an important and fundamental correlate of improved health and well-being.

In this research, measures of personal competence and self esteem were assumed to reflect separate and important parts of an individual's store of personal resources. Further, under conditions of stress such as pregnancy, individuals may vary in the extent to which they become vulnerable to the diminution of these aspects of self. Through a weakening of these particular resources, individuals may become more susceptible to various environmental insults (Pearlin et al., 1981). A discussion of the measurement of self esteem may be found in Section Six.

4.2.4 Social Resources

As previously noted, research efforts have provided considerable evidence for a substantial link between socially supportive relationships and physical health. We were concerned with supportive relationships likely to be crucial to adolescents such as those between the young woman and her family (mother and father), the father of her baby and her close friends.

The research literature concerning the relationship between social support and pregnancy outcomes is sparse and focuses, for the most part, upon the buffering or

mediating effects of social support for stressful circumstances in pregnancy complications. Using a prospective design, Norbeck and Tilden (1983) assessed the impact of life stress and tangible support on complications of pregnancy and delivery. Their sample consisted of 117 women between the ages of 20 and 39 years attending an obstetric clinic of a large university medical centre. The items chosen to index tangible support ranged from financial aid to material assistance in the event of illness. The interaction of tangible support and life stress was significantly related to each type of complication considered by this study.

The findings of Norbeck and Tilden (1983) are consistent with those of Nuckolls et al., (1972). These investigators also found that women who experienced low levels of support in the presence of high levels of stress had a complication rate three times higher than women reporting high levels of support. Although the outcomes of these studies do not take gestation or birth weight as their dependent measures, the complications evaluated are known to be associated with these outcomes. The complications assessed included: preterm labor; anemia in the third trimester; elevated blood pressure over the antepartum period; prolonged rupture of the membranes and delivery by cesarean section.

While other studies have examined the relationship between social support and adjustment to pregnancy and the mothering role (Cochran and Brassard, 1979; Wandersman et al., 1980; Barrera, 1981; Crockenberg, 1981; Crnic et al., 1983), only the studies of Nuckolls et al. (1972) and Norbeck and Tilden (1983) examined the relationship between supportive circumstances and pregnancy complications. An objective of this study was to add further to our understanding of the ways in which supportive relationships may influence pregnancy outcome.

4.2.5 Parental Relationships

Among the supportive relationships considered was the influence of her family. There can be little doubt that strong family ties or bonds are crucial to the young woman's social, emotional and physical well-being (Rutter, 1972; Bowlby, 1977; Parker et al., 1979, Boyce, 1985). Parental influence may affect the likelihood that an individual will accumulate those intrapersonal resources necessary to confront problematic circumstances of life. In Bowlby's terms the individual will have "... built up a representational model of himself as being able to help himself and as worthy of being helped should difficulties arise" (Bowlby, 1977:206). In addition, it seems

reasonable to assume that the quality of the teenager's relationship with her mother and father may be a significant factor influencing her physical and emotional well-being during her pregnancy.

This study investigated the parental contributions to the parent-child relationship. Specifically, we have examined the respondent's perception of the quality of her individual relationship with each parent along the dimensions of "care" and "protection". The instrument chosen to measure parental perceptions is discussed in Section Six.

As mentioned earlier, additional sources of support were examined. The father of her baby and her close friends were considered to be important sources of perceived support. A measure of perceived support from the father of the baby and a global measure of perceived support from friends are described in Section Six.

4.3 Stressful Circumstances

The relationship between stressful life events and illness is now well documented (Holmes and Rahe, 1967; Holmes and Masuda, 1974; Rabkin and Struening, 1976; Gersten et al., 1977; Vincent and Rosenstock, 1979;

Pearlin et al., 1981; Thoits, 1983). Complications of pregnancy have also been associated with life stress (Nuckolls et al., 1972; Gorsuch and Key, 1974; Williams et al., 1975; Norbeck and Tilden, 1983).

Pregnancy is generally considered a critical event in a woman's life involving some degree of emotional disequilibrium (Leifer, 1977). Pregnancy for young women may be even more stressful than for older women. This argument arises in part from the recognition that pregnancy among young women most often occurs out of wedlock and as well, that pregnancy at this stage of the life cycle may be incompatible with the demands of adolescence.

Pregnancy among adolescent women may constitute a major interruption in the life course. Truncated educational experience, limitations on labor force participation and the sudden transformation to a parenting role have been identified as the possible consequences of childbearing among teenage women (Menken, 1972; Furstenberg, 1976; Friedman and Phillips, 1981).

Pregnancy, whether intended or not, and the consequent interruptions in the life course are superimposed upon a developmental period characterized by

"... great stress, impoverished coping skills and consequent vulnerability" (Hamburg, 1974:101). Therefore, it would seem reasonable to conclude that pregnancy and its potentially enduring strains constitute an additional task requiring significant adjustment and adaptation on the part of the young women and is likely to involve substantial social and psychological stress.

The possible influence of life stress on length of gestation and infant birth weight has not been directly addressed in the literature. However, the complications measured and found to be significantly associated with a stress-support interaction by both Norbeck and Tilden (1983) and Nuckolls et al. (1972) are known to be associated with these outcomes. This study has included stress arising from three possible sources; random, episodic life events occurring over a twelve month period, stress arising from the pregnancy and stress arising from financial circumstance. The measures chosen to index these stressful experiences are described in Section Six.

4.4 Other Risk Factors

The factors so far considered (personal resources, supportive relationships and stressful circumstances) form the major independent variables in this investigation. In addition, a specific cluster of variables referred to as

other risk factors will be considered. These variables have been identified in previous research as correlates of length of gestation and infant birth weight. However, possible associations between these variables and the socio-environmental factors discussed earlier have not, as yet, been explored. This research attempts to broaden our understanding of the relationship between known correlates and the study outcomes by considering a possible intervening role for the socio-environmental variables.

Smoking and alcohol consumption have been identified as risk factors in pregnancy. Pregravid weight, weight gain over the pregnancy and adherence to a schedule of prenatal visits are also considered as other risk factors. The negative impact of smoking, alcohol consumption, prenatal visits and weight gain during pregnancy for both the mother and the fetus/neonate are well documented (Chase, 1972; Niswander and Gordon, 1972; Meyer, 1977; Little, 1977; Edwards et al., 1979; Garn and Petzold, 1983; Kelly et al., 1984). A description of each measure is presented in Section Six.

4.5 Social Class

Among the many factors associated with birth weight, perhaps the most well recognized is social class (Niswander and Gordon, 1972; Dunn, 1984). Efforts to

identify relevant aspects of social class for infant birth weight have led investigators to consider the relationship from many perspectives. Baird (1977) has suggested that a mother's reproductive efficacy was strongly influenced by the quality of her environment from birth to maturity and may indirectly influence infant birth weight. The early work of Drillien (1972) provided some support for Baird's view with the finding that social class of origin was more closely associated with the likelihood of a low weight birth than was the social class into which she married.

Many investigators have suggested that adverse conditions more prevalent within the lower classes may account for the observed relationship between social class and infant birth weight. Pursing this hypothesis, Ounsted and Scott (1982) evaluated the relative risk of several maternal factors by social class for delayed fetal growth. These investigators found a relative risk for lower social class women having a small-for-gestational age infant of 1.75. However, the risk decreased to 1.25 with adjustment for smoking, hypertension, age, height, and weight. Although some effect of social class remained, the initial risk was substantially reduced.

An objective of this study was to examine the role and significance of the socio-environmental factors so far

considered, in explaining the relationship between social class and study outcomes. A discussion of the measurement of social class is presented in Section Six.

4.6 Marital Status

Marital status of the mother was also regarded as a risk factor in pregnancy outcomes. The World Health Organization's Study of Perinatal Mortality (1978) reported higher rates of perinatal death among illegitimate births. It was the intention of this study to further explore the relationship between marital status and study outcomes.

4.7 Conclusions

Pregnancy is a health event with varying outcomes, both for the mother and the fetus/neonate. This investigation was primarily concerned with two important variables closely associated with the immediate and long term health of the infant, length of gestation and infant weight at birth. A review of the literature on social class, marital status, and other risk factors finds important evidence for the relevance of these variables in relation to length of gestation and infant birth weight. However, the potential effects of stressful circumstance,

the family's level of support generally as well as more specific aspects of the parent-child association, and personal resources as well as interactions among these factors have not been adequately considered in the literature on the course and outcome of pregnancy. Given the substantive work of many investigators in the area of stress, social support, personal resources and physical health outcomes, these variables appear to be promising areas for research into the determinants of length of gestation and birth weight.

CHAPTER 5.0

RESEARCH QUESTIONS

5.1 Introduction

There can be little doubt that both length of gestation and infant birth weight are among the most important variables for infant health and well-being. Research efforts have successfully identified a number of factors associated with these outcomes, however much remains to be learned. Therefore, the purpose of this investigation was two-fold. A first purpose was to identify new and potentially important determinants of the study outcomes. A second purpose was to investigate a potential mediating role for these variables with known correlates of the study outcomes. In keeping with these purposes, four research questions are outlined.

A. What is the relationship between the independent variables of stress, support, personal resources and other factors and length of gestation and infant birth weight? How do these factors relate to one another and to the study outcomes?

B. What is the relationship between demographic factors of age, marital status and social class with length of gestation and infant birth weight? What part of the relationship may be accounted for by the variables of stress, support, personal resources or other risk factors?

C. What is the relationship between other risk factors and study outcomes? What part of that relationship may be accounted for by the variables of stress, support and personal resources?

In addition to the central questions and given the findings of a significant stress-support interaction by Nuckolls et al. (1972) and Norbeck and Tilden (1983), this research will also investigate the possibility of such an interaction with the following question.

D. Are variations in level of support in the presence of high levels of stress associated with length of gestation and/or infant birth weight?

CHAPTER 6.0

METHOD

6.1 Introduction

The study entitled Social Support and Outcomes in Teenage Pregnancy was supported by a grant from Health and Welfare, Canada and was based at the Health Care Research Unit, at the University of Western Ontario. The grant to conduct that study was received in the fall of 1982. Its primary purpose was to examine the role and significance of social support for both maternal and infant health complications and for adjustment of the teenage mother to the mothering role.

The field work procedures for the larger study (Social Support and Outcomes in Teenage Pregnancy) are described in detail in this chapter. My investigation took a distinct focus within this larger study and used a subsample of 204 respondents from the larger study's compliment of 284. This subgroup of 204 respondents was chosen from the larger group of 284 using the selection criteria outlined in Section 6.3 of this chapter. The focus of my research was to identify potential new variables influencing length of gestation and infant birth weight and to determine whether such variables might have

a mediating role in the association between some of the well known determinants of length of gestation and infant birth weight.

6.2 Research Design and Field Work Procedures

The larger study of social support and outcomes in teenage pregnancy employed a prospective, longitudinal design. This study was conducted over a period of 48 months, from 1982 to 1986. Interviews with subjects were conducted over a 38 month period beginning in 1983 and ending in 1986. Subjects were interviewed at two points in time; first, as soon as possible after the confirmation of pregnancy and again six weeks following the delivery of the baby. Hospital records of both the mother and the neonate were accessed and data abstracted. Subjects were drawn primarily from the caseload of family physicians and obstetricians with practices located in Middlesex and Elgin Counties. The author was primarily responsible for all interviewing and the abstraction of data from hospital records.

6.2.1 Initial Phase of the Study

During the initial phase of the study, professionals in the categories listed above were identified from the

mailing list of the London and District Academy of Medicine and cross-referenced with both the telephone book and lists of physicians with delivery privileges at the major hospitals in Middlesex and Elgin Counties. A pool of physicians with practices located in Middlesex and Elgin Counties was then assembled. A mail-out of information about the study with an enclosed, self-addressed return postcard was made. The postcard allowed physicians to indicate a willingness to participate, a refusal to participate or a desire to make a decision upon receipt of further information. All refusing physicians were contacted either by project staff or by one of the two physician co-investigators to ascertain their reason for refusing. All physicians willing to participate or who requested more information about the study were contacted by phone and an appointment was made to speak with the physician(s) and the office staff.

At these meetings, the objectives and procedures of the study were introduced to the physicians and their office staff. Their co-operation in the identification and referral of eligible participants was obtained. A staff member within each practice and/or agency was identified as the person to be contacted monthly by project staff for potential subject referrals.

6.2.2 Physician Participation and Subject Referral

Initially, 244 physicians (including obstetricians) were contacted. Of this group 26.2 percent (64 physicians) refused to participate. The primary reason given was that patients in the practice were older and few, if any, teenage pregnancies were seen. Over the 38 months of subject intake a core of 97 physicians emerged as a source of subject referral. Thus, 53.9 percent of the participating practices were able to contribute one or more subjects over the course of the study.

Altogether, 240 subjects (84.5%) were contributed to the study by the 97 participating physicians. On average, 6 subjects per month were entered into the study from this source. Given that an average of 23 live births per month to teenage mothers, registered as living in Middlesex County was reported by the Ontario Ministry of Health, it became clear that a larger proportion of the available population might be enrolled through sources other than physicians.

Two other sources were identified, public health nurses and an advertisement in the London Pennysaver, a free publication of bargain and sale items with a community-wide distribution. An additional 31 subjects

(10.9 percent of the sample) were obtained through the newspaper and 13 subjects (4.6 percent of the sample) were identified through public health nurses.

6.2.3 Estimates of Subject Refusal

The total number of eligible subjects identified through physicians and the number of refusals was an accumulated total obtained from all monthly telephone calls made to the participating practices and recorded in the study logbooks (see Table 6.0). The total number of potential subjects identified and the number of refusals must be viewed with caution. Because of the issue of confidentially, it was not possible to know if all practices provided complete disclosure of the number of young women approached by the doctor about the study, the number who refused, the number who made only one visit and did not return or the number excluded because of a decision to terminate the pregnancy.

Pregnancy, particularly among young women, is a sensitive issue and was regarded by many of the participating physicians as a matter of doctor-patient confidentiality. Thus, information on women who were willing to participate was freely given. However, for women who did not want their names released or who may

have decided to terminate the pregnancy, even simple questions about the number who were approached and refused was regarded as confidential and not disclosed.

The first refusal rate calculated was 46.3 percent (Table 6.0) and was based on the number of participants as a percentage of the estimated number of subjects approached. Given the likelihood that some part of the refusals could be more properly classified as exclusions due to pregnancy termination, a second refusal estimate was calculated, adjusted for the proportion of teenage pregnancies that ended in abortion in Middlesex County, over the study period. With approximately 50 percent of all teenage pregnancies ending in abortion (Ontario Ministry of Health) the adjusted refusal rate was 30.03 percent. It is likely that the true refusal rate is bounded by these two estimates.

It was possible to calculate a refusal rate only for the 240 subjects referred to the study by participating physicians. It was not possible to institute a system for counting refusals through the public health nurses.

TABLE 6.0

ESTIMATES OF SUBJECT REFUSAL

Estimated number of subjects approached by physicians:	447
Number of participants:	240
Estimated Refusals:	207 (46.3%)
Estimated Refusals: (adjusted for abortions)	104 (30.03%)

NOTE: Estimates of refusal could be made only for physician referrals.

6.3 Study Group Selection Criteria

The subgroup of 204 study respondents was drawn from the subject compliment of the larger study (N=284) using the following selection criteria:

a) women who were less than twenty years old at conception;

b) who were primiparous and delivered a live, singleton infant;

c) who received antenatal care in either Middlesex or Elgin County; and

d) who provided appropriate consent to access medical records.

Altogether 80 subjects from the larger study's compliment of 284 were excluded leaving a study group of 204 respondents for my investigation. The 80 subjects were excluded because: 46 had not delivered at the time of analysis; 21 were multiparous and 13 had a multiple birth.

6.4 Sample Size and Estimates of Statistical Power

The sample size estimate for this investigation was made to determine whether the major analytic techniques proposed would have sufficient power to reliably detect the presence of significant relationships, should any exist. These calculations are outlined in Appendix A and provide confidence in the adequacy of the study group of 204 respondents to meet the analytical requirements of this research.

6.5 Issues of Confidentiality and Assessment of Bias

As already noted, the age of the study participants and the sensitive nature of the research topic required additional care and consideration in matters of confidentiality. Potential subjects were first informed of the study by their physician or public health nurse and their participation in the study was sought at that time. If the young woman refused to participate, physician /

patient confidentiality was observed and no further information was made available.

Bias introduced through the loss of potential subjects at cohort formation holds particular implications for the generalizability of study findings to the target population. While a lost cases analysis was not possible for the reasons outlined, it was possible to compare the sample distribution to the population distribution for a limited number of variables. The distribution for the following variables was obtained from the Ontario Ministry of Health: infant birth weight; gestational age; infant sex; maternal age; paternal age and marital status of the mother. Comparisons were made for women less than twenty years old by county of residence for each study year. The results of this analysis are summarized in Appendix B. With the exception of paternal age, no significant differences between the study group and the population of parturient adolescent women were found.

Bias may also be introduced through dropouts to the study occurring after the subject has agreed to participate. The refusal rate among those who had initially agreed to participate was less than three percent. Therefore, any bias introduced through such lost participants was considered negligible. The main reason

given by those who subsequently refused to participate were objections by the father of the baby or by her family.

6.6 Informed Consent

For the purpose of this research, informed consent means the participant has signed a consent to access medical records. This form may be found in Appendix C. It was approved by the Medical Records Committee of each participating hospital and conformed to the guidelines established by the Public Hospital's Act (1983).

6.7 Subject Intake and Sources of Data

Subjects for this study were drawn primarily from the caseload of participating physicians. For their part, physicians were asked to approach potential subjects as soon as possible after the confirmation of pregnancy and to persuade the young woman to participate in the study. In order to assist the physician and the public health nurse in describing the study, all practices were supplied with a number of single page descriptive outlines to be given to potential subjects for their consideration. To further encourage participation, all subjects were paid a nominal fee of five dollars for the first interview and

ten dollars for the second interview. During the first interview, subjects were asked to sign a consent to access medical records.

6.7.1 Questionnaire Format

Given the emphasis placed on early participation, it was believed that many potential subjects might not have told one or both parents and/or other important family members about the pregnancy. In cases where significant others were as yet unaware of the pregnancy or the circumstances in the home were not conducive to face-to-face interviewing, alternative approaches were necessary. These alternatives included interviewing the young woman in the doctor's office or in another location suitable to the respondent. It was therefore necessary to construct an interview schedule that could be self-administered (as in the case of interviews conducted in a physician's waiting room) or that could be administered by an interviewer. To achieve maximum flexibility in this regard, the interview schedule followed a self-administered format with a grade seven reading level, where possible. In 7.4 percent of the cases (15 respondents), the interviews were self-administered.

While many subjects were married or living in a stable relationship, others were not. Therefore, two questionnaires, one for single women and one for women in a stable relationship were developed. These two interview schedules differ only to the extent that date of marriage and the father's gender preference for the infant were gathered for the latter. The initial interview took approximately 50 minutes to administer and may be found in Appendix D.

6.7.2 Subject Interview

The larger study consisted of two waves of data collection and information abstracted from the hospital record of the mother and her infant(s). Once the young woman had agreed to participate in the study, her name and address were released to project staff. An interview date was then scheduled and the initial interview with the mother was conducted as early as possible in the antepartum period. The author was responsible for the construction of all questionnaires and the scheduling and interviewing of the subjects. On average, respondents were interviewed during the fifth month of their pregnancy. A structured interview was administered at the home of the participant in the majority of cases. Other locations

included the home of relatives, friends or the physician's office. In 15 of the 204 cases (7.4%) it was not possible to conduct a face to face interview. Instead questionnaires were completed by the respondent. Initial interviews were conducted over a 38 month period beginning January 1, 1983 and ending February 28, 1986. Subject intake was stable with approximately seven new cases per month being added to the study.

The second interview took place six weeks after delivery. Only selected variables from that interview were used in this research. These variables were number of prenatal visits, alcohol use, cigarette smoking and a measure of life event stress. Information on these variables was obtained at the second interview because they provided data over the pregnancy and up to delivery that was not available elsewhere.

6.7.3 Medical Chart Abstraction

At the time of the initial interview all subjects were asked to sign a consent to access medical records. For subjects less than 18 years old, parental or guardian consent was necessary. Information was abstracted from the hospital chart of the mother and her infant as soon as possible after the birth. If the young woman delivered at

a hospital outside of Middlesex or Elgin Counties, a written request was issued for her records.

The primary outcomes of concern were infant weight at birth and length of gestation. However, additional information relevant to the pregnancy was obtained. This information was gathered using a form based on that employed by Grindstaff and Riordan (1983). This form was developed and used to abstract approximately 3300 obstetric charts at St. Joseph's and Victoria Hospital, in London, Ontario. Revisions to this form were necessary to improve the efficiency of the abstraction process and to meet the objectives of the current study (see Appendix E).

6.8 Instrument Development and Pretesting

As already noted, maximum flexibility was needed for the interviewing process. Therefore, the questionnaire was constructed so that it could be self-administered, when necessary. The questionnaire used in the larger study was developed and pretested on a sample of thirty-two patients referred by study physicians. The majority of these patients were post delivery. The key issues considered in conducting the pretest were: question flow and arrangement; comprehension of the questions, particularly for younger ages; the identification of potentially

upsetting questions, and obtaining sufficient information for a statistical analysis of the proposed multi-item scales.

Although pregnant teenage women would have served as an ideal pretest sample, the possibility of depleting an already scarce study population necessitated the use of a suitable alternative sample, ie., teenage women who had already delivered a baby. Before pretesting, the new measures were scanned to identify items likely to be relevant only to an antenatal sample. No such items could be identified. Therefore, pretesting with a postpartum group was deemed acceptable. Some modifications were made on the basis of pretest results and additional items were added (ie., competence, coping and self esteem scales).

The medical record abstraction form was revised and pretested on a sample of randomly selected obstetric charts of teenage patients at a London hospital. Modifications were made to more closely follow the logical flow of the hospital record.

6.9 Measurement

In this section, the following measures will be discussed:

1. social support
2. stress
3. personal resources
4. other risk factors
5. social class, marital status
6. length of gestation
7. infant birth weight

Some instruments have been used in previous research and published information on reliability and validity were available. Others have been developed by the author specifically for this study. Information on the formal properties of each measure, based on the study data will be presented. The distribution of each variable may be found in Appendix F.

6.9.1 Assessment of Multi-Item Scales

Survey research, conducted through the use of questionnaires as in this study, provides an opportunity to assess reliability using the methods of split-half, test-retest or internal consistency. For this study, both cost and logistics determined, in large part, the method of reliability assessment to be used. As already noted in Section 6.7.1, it was anticipated that a number of subjects might be interviewed in the doctor's office or in

locations more acceptable to the respondent. This was necessary in cases where the young women had not yet revealed her pregnancy to one or both of her parents and/or siblings or where, in the respondent's view, circumstances in the home were not appropriate for interviewing. Given the difficulties anticipated in arranging even the initial interview, the choice of internal consistency as the method for assessing the reliability of the new measures was made.

The internal reliability of each scale was assessed through the use of Cronbach's Coefficient Alpha for scale additivity. Where appropriate, the factor structure of multi-item scales was assessed using principal component analysis. Based on the selection criteria outlined in Section 6.3, a study group of 204 respondents was assembled. However, for the multivariate assessment techniques of internal reliability and factor analysis, information from the full study sample of 284 respondents was available. Given the added statistical power of a larger sample size, it seemed reasonable to use all available data. Data analysis was conducted using SPSS-X on the IBM 4341.

6.10 Social Support

Although the concept of social support differs across disciplines, a common theme which emphasizes both the properties and processes of the individual's social system is clearly evident. Measurement efforts that, in part, reflect the diversity of these ideas may be loosely categorized into studies of the objective aspects of social networks and investigations of the social-psychological or perceptual content of supportive relationships. While such measurement approaches do not represent opposing views, recent evidence suggests it is the perceptual aspect of social support that may matter for health (Turner et al., 1983; Wethington and Kessler, 1986). The perceptual nature of social support was of primary interest to this research. Three sources of support hypothesized to be relevant to an adolescent population were considered: family, the father of the baby and friends. The nature and formal properties of the chosen support measures are discussed in turn.

6.10.1 Parental Support

Measures of social support abound in the literature. However, the instruments used are diverse and lack careful attention to issues of measurement. A review of the

literature revealed a scale particularly suited to the purposes of this study. The Parental Bonding Instrument, developed by Parker and his colleagues (1979) was chosen because it appeared to tap the contribution of each parent to the parent-child relationship from the respondent's perspective. This measure provides information along two dimensions; care and protection. The notion of care, that is the extent to which one feels loved or cared for, and worthy of concern by important others is germane to the concept of perceived support. As well, the ease of administration, and the considerable evidence of satisfactory reliability and validity formed the bases for the selection of this measure (Parker et al., 1979).

The full instrument consists of 25 items. Each item is scored along a 4 point scale ranging from "very much like" to "not at all like my mother or father". Its authors have identified two factors, care vs. indifference or rejection (12 items) and control or intrusion vs. encouragement of independence (13 items). Respondents were asked to complete the scale by first considering each item with respect to mother. The procedure was then repeated but with respect to father (Table 6.1A). If a biological parent was unknown, a step-parent could be substituted, a strategy used by Parker et al. (1979). However, if a biological parent was unknown and there was no suitable

parental figure as a replacement, then the questions were not applicable and left blank.

A confirmatory factor analysis with varimax rotation to a two factor solution was performed. As can be noted from the sample sizes given in Table 6.1A and 6.1B, all available information from respondents who completed these questions was used in the determination of the factor structure and the internal consistency of this measure. As expected, two distinct, bipolar factors emerged for both mother and father. The first factor explained 39.1 percent of the total item variance for mother (33.1% for father) and contained only care items as identified by Parker and colleagues. Parker et al. (1979) reported that 28 percent of the variance was explained by the first factor. The 12 items, loaded on factor one, clearly formed an additive scale as indexed by coefficient alpha (.93 for mother, .92 for father). The scale mean was slightly higher for mothers compared to fathers (25.1, sd=9.3 vs. 22.8, sd=9.8) suggesting mothers may be perceived as slightly more caring than fathers.

The second factor, presented in Table 6.1B, contained items suggesting over-protectiveness and explained 11.1 percent of the total item variance for mothers (13.6% for fathers). Parker et al. (1979) reported that 17 percent of

TABLE 6.1A

FACTOR LOADINGS AFTER VARIMAX ROTATION, COEFFICIENT ALPHA AND SUMMARY MEASURES FOR ITEMS OF THE PARENTAL BONDING INSTRUMENT (P.B.I.)

Factor Items Factor 1: Care		Factor Loadings			
Item No.	Item Description	Mother		Father	
		Factor 1	Factor 2	Factor 1	Factor 2
6	was affectionate to me	.796	-.161	.847	-.106
11	enjoyed talking with me	.778	-.242	.768	-.135
17	could make me feel better	.776	-.209	.745	-.095
1	spoke warmly to me	.770	-.232	.756	-.169
5	understood my problems	.702	-.341	.712	-.094
12	frequently smiled at me	.632	-.120	.729	-.066
16	made me feel I wasn't wanted	-.765	.234	-.734	-.149
4	seemed emotionally cold	-.756	.195	-.704	.174
18	did not talk with me much	-.746	.169	-.686	.109
24	did not praise me	-.717	.036	-.687	.065
2	did not help me as much as I needed	-.685	.078	-.599	.025
14	did not understand my needs	-.602	.389	-.591	.180

	MEAN	SD	RANGE	ALPHA	N
MOTHER	25.1	9.3	1-36	.93	274
FATHER	22.8	9.8	1-36	.92	243

TABLE 6.1B

FACTOR LOADINGS AFTER VARIMAX ROTATION, COEFFICIENT ALPHA AND SUMMARY MEASURES FOR ITEMS OF THE PARENTAL BONDING INSTRUMENT (P.B.I.)

Factor Items Factor 1: Protection		Factor Loadings			
Item No.	Item Description	Mother		Father	
		Factor 1	Factor 2	Factor 1	Factor 2
23	was over protective of me	.724	.046	.692	.129
9	tried to control everything I did	.667	-.336	.691	-.325
20	felt I could not look after myself	.629	-.286	.639	-.153
10	invaded my privacy	.585	-.458	.514	-.373
19	tried to make me depend on her	.577	-.176	.650	-.095
8	did not want me to grow up	.571	.059	.494	-.009
13	tended to baby me	.559	.317	.412	.180
15	let me decide things for myself	-.669	.340	-.640	.310
7	liked me to make my own decisions	-.637	.307	-.505	.390
21	gave me as much freedom as I wanted	-.538	.303	-.693	.080
3	let me do the things I liked	-.481	.369	-.437	.448
22	let me go out when I wanted	-.459	.303	-.649	.138
25	let me dress any way I pleased	-.438	.197	-.511	.130

	MEAN	SD	RANGE	ALPHA	N
MOTHER	14.4	8.6	1-38	.87	274
FATHER	13.6	8.5	1-38	.85	243

the variance was accounted for by the second factor. The scale mean was slightly higher for mothers compared to fathers (14.4, sd=8.6 vs. 13.6, sd=8.5) again suggesting mothers may be viewed as slightly more over-protective than fathers.

The quadrant method of scoring was not used. Instead, summary scores of the balance between care and protection were created for each parent by subtracting their total score on the protection items from their total score on the care items. Although the protection scale contained one more item than the care scale (12 vs. 13 items) this small inequality in item numbers would not seriously over-estimate the contribution of the protection scale to the summary score. This method of calculating the summary score was used to achieve an indicator of which component, care or protection, appeared to be more prominent. The scoring method used for all scale items is presented in Table F.26. Complete details for scoring all scale items and calculating the summary scores have been published elsewhere (Parker et al., 1979). For this scoring method, high positive scores indicate a preponderance of care while high negative scores indicate a preponderance of over-protection. The distribution for the mother and father scale is presented in Tables F.16 and F.17.

For the study group of 204, the mean summary score for mother was 10.8 (sd=15.3) and for father, it was 9.2 (sd=15.1). An absent father was reported by 31 respondents. In no case was a suitable step parent available. To retain these cases in analyses, the mean for the group was assigned to those cases missing a father support score. The implications of assigning the group mean for missing values is discussed in Chapter 9.0 (Section 9.2).

6.10.2 Partner Support (Father of the Baby)

A review of the literature concerning adolescent pregnancy revealed that scant attention had been paid to the father of the baby. Level of support from the baby's father as perceived by the respondent was measured using a five item scale developed by the author. Aspects of emotional support thought to be important components of the father's supportiveness were developed. Two items with face validity as indicators of emotional support were adapted from a scale of marital role strain developed by Pearlin and Schooler (1978). Three additional items were then developed by the author (Table 6.2). Each item was scored on a four point scale and ranged from "strongly

TABLE 6.2

COMPONENT ITEMS, STANDARDIZED ITEM ALPHA AND SUMMARY MEASURES FOR PARTNER (FATHER OF THE BABY) SUPPORT SCALE

He is someone:	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
*a) I can talk with about things that are important to me.	1	2	3	4
b) who is affectionate toward me.				
*c) who wants to be involved in caring for the baby.				
d) who understands how I am feeling.				
e) I can count on for financial support, should I need it.				

MEAN	SD	RANGE	ALPHA	N
15.3	4.9	5-20	.91	282

*SOURCE: L. Pearlin and C. Schooler (1978)

disagree" to "strongly agree". Increasing scores indicate increasing level of perceived support. Within the study group, this scale ranged from a low of 5 to a high of 20 with a mean score of 15.5 (sd=4.9).

All five scale items were scored in a positive direction, thereby introducing the possibility of a response bias. It was not possible to rule out, with certainty, the presence of a bias in responses for this sample. The distribution for partner support is presented in Table F.18.

The internal reliability of this scale was .91, indicating the appropriateness of adding the items to produce a summary score for use in analysis (Table 6.2). Although scale items have face validity as a measure of support, further research that incorporates other measures of partner support will be necessary to establish content validity.

6.10.3 Friend Support

The importance of friendship, particularly in adolescence is well established (Hamberg, 1974). Although measures intended to address aspects of friend support were available, many focused on the level of intimacy (ie. Bell and Boat, 1957; Weiss, 1974) or assessed the

availability of a confidant but not the content of that relationship (ie. Wellman, 1981).

A measure of the subjective experience of support from friends appeared to be adequately captured in the Provisions for Social Relationships Scale (PSR) developed at the Health Care Research Unit at the University of Western Ontario. This 18 item scale has been used in previous research conducted by this unit and has demonstrated satisfactory formal properties (see Turner et al., 1983).

A sub-dimension of this scale contained 9 items suggesting friend support. The internal reliability of this sub-scale was .83. Factor loadings and summary measures for the friends scale, again using all available information to assess the properties of this instrument are presented in Table 6.3.

Respondents were asked to determine how closely each statement described their relationship with others by responding on a 5 point scale ranging from "very much like" to "not at all like this". For this scale increased scores indicate increased friend support. The distribution for friend support is presented in Table F.19. For the study group, a nine item summary measure of perceived

TABLE 6.3

FACTOR LOADINGS AFTER VARIMAX ROTATION, COEFFICIENT ALPHA AND SUMMARY MEASURES FOR ITEMS OF THE FRIENDS SUBSCALE, PROVISION FOR SOCIAL RELATIONSHIPS (P.S.R.)

Items Factor: Friends		Factor Loadings	
Item No.	Item Description	Factor 1	Factor 2
11	feel close to my friends	.746	.099
1	able to relax with friends	.715	.061
16	talk over my problems	.690	.125
6	do things with my friends	.646	.142
7	can tell a friend anything	.613	.007
2	share same view on life	.594	.018
4	am trusted and respected	.589	.136
18	sometimes feel alone	.576	.139
15	good at what I do	.522	.152

MEAN	SD	RANGE	ALPHA	N
16.6	6.2	9-45	.83	284

friend support was formed and used in analysis. The mean score for the friends factor was 35.4 (sd=5.5).

In summary, the main sources of support considered in this study were parents, partner (father of the baby) and friends. Although supportive relationships were the focus of concern, it was believed that each measure was tapping a separate and distinct dimension of support. This belief was based in part upon theoretical considerations and upon the zero order correlations among the measures. Moderate and positive associations were obtained between measures of mother and father support ($r=.31$, $p<.05$). Although these results do not fully address the issue of collinearity among support measures, they do indicate that combinations of these variables may be included in multiple regression analysis.

6.11 Stressful Experiences

In this investigation three types of stressful experiences were considered. The random stresses that occur as part of daily living, stresses more directly related to the experiences of pregnancy and stresses arising from financial difficulties. These sources of stress have been identified as likely to be of particular relevance for this study group.

6.11.1 Life Events

Stressful experience over the pregnancy was measured using both a modified version of a life events scale and a scale, developed by the author, to index stress particular to pregnancy. The life events scale used in this study was a modified version of the 51 item Coddington Life Events Scale (1979) developed on an adolescent population.

The scale was reduced to 22 items by choosing events found by Coddington to vary significantly between pregnant teenagers and a non-pregnant control group. Modifications were then made to this scale by the author. These modifications included asking the respondent to give the month and year in which an identified event occurred. Gathering the month of occurrence for each event made it possible to identify a common exposure period of 12 months from delivery for each respondent. Levels of perceived stressfulness for each event were measured along a three point scale that ranged from "not at all stressful" to "very stressful" (Table 6.4). The distribution for life event stress is presented in Table F.13.

The summary measure used in analysis was calculated as a sum of individual items weighted by their associated

TABLE.6.4

MEAN ITEM NUMBER AND MEAN STRESS LEVEL FOR ITEMS OF THE LIFE EVENTS SCALE

In the past 12 months:	Happened		Month			
	No	Yes		None	Some	Very
	0	1	———	1	2	3

a) I have started high school/ university.
b) I have started to date.
c) My parents have seperated/divorced.
d) I have had more arguments with my parents.
e) My brother/sister left home.
f) I started using illegal drugs or alcohol.
g) A close friend of mine died.
h) My parents have started to argue more.
i) I had to quit school.
j) I have had more arguments with my husband/boyfriend.
k) I was suspended from school.
l) My grandmother/father died.
m) I have moved away from my old neighbourhood.
n) Someone close to me was sick enough to stay in hospital.
o) I failed a grade or a course.
p) My husband/boyfriend lost his job.
q) I was in trouble with the law.
r) My brother/sister died.
s) I was sick and had to stay in hospital.
t) Another adult came to live with my family.
u) I broke up with my husband/boyfriend.
v) I discovered I was pregnant.

MEAN NO. ITEMS	SD	RANGE
5.7	2.5	0-22

MEAN STRESS LEVEL	SD	RANGE
12.0	4.4	0-66

stress level. The mean stress score for the study group was 13.5 (sd.= 6.1) and ranged from a low of 2 to a high of 35. This scale provided a summary score of events that were both random in occurrence and that were likely taxing of an individual's resources in confronting such events. This scale was chosen over the many others available because of its relevance to an adolescent population.

6.11.2 Pregnancy Stress Scale

A second stress scale was developed specifically for this study by the author. This 8 item scale was intended to measure the occurrence or the anticipated occurrence and the perceived stressfulness of events attributable to the pregnancy. The specific events included leaving school or work, moving to a new residence and changes in key relationships that, in the respondent's view were due to her pregnancy. This scale took into account events that may not, at the time of the interview, have taken place but were none the less stressful in their anticipation. Therefore, two mutually exclusive response options were available for each event: the event had already happened and a stress level was identified or the event was about to happen and the stressfulness of the anticipated event was identified. Since the response options of "has

TABLE 6.3

MEAN ITEM NUMBER AND MEAN STRESS LEVEL FOR ITEMS OF THE PREGNANCY RELATED STRESS SCALE

Because I am pregnant:

	Has Happened			Might Happen		
a) I had to leave school/work for awhile.	1	2	3	1	2	3
b) I had to move to a different place (ie. larger apartment, move from parents home, etc.).						
c) Some of friends have changed.						
d) I have new expenses (ie. baby clothes, supplies etc.).						
e) My relationship with my family has changed.						
f) My relationship with my husband/boyfriend has changed.						
g) I don't go out as much as I used to.						
h) I have had some illness because of my pregnancy.						

MEAN NO. ITEMS	SD	RANGE
5.3	1.7	0-8

MEAN STRESS LEVEL	SD	RANGE
9.5	4.4	1-24

happened" and "might happen" are mutually exclusive, the scores over the 8 items were summed to form one total score which represents a mixture of actual and anticipated stress. The stress level was coded as 1, meaning "not at all stressful" to 3, meaning "very stressful" giving a possible range of 0 to 24 for this scale (Table 6.5). The distribution for the pregnancy related stress scale is presented in Table F.14.

A summary score for analysis was computed as the sum of the identified events weighted by their associated stress level. For the study group, the mean pregnancy related stress score was 9.7 (sd = 4.1) and ranged from a low of 0 to a high of 20.

6.11.3 Financial Stress

The potentially enduring difficulty of financial hardship was considered a likely source of stress for this group. A measure of economic strain developed by Pearlin and Schooler (1978) was modified for use in this research. This scale was intended to measure the frequency with which the respondents found that they did not have enough money to cover a range of basic life expenses from "buying the kinds of food you need" to "paying all the bills that come in" (Table 6.6).

TABLE 6.6

COMPONENT ITEMS, STANDARDIZED ITEM ALPHA AND SUMMARY MEASURES FOR FINANCIAL STRAIN

Do not have enough money:	Never Happens	Happens Once in Awhile	Happens Fairly Often	Happens Very Often
*a) to buy the kind of food you need?	1	2	3	4
b) to pay the rent (mortgage) without help?				
*c) to buy the clothing you need?				
d) for transportation costs (bus, gas for car?)				
e) to spend on things that you (your family) want?				
f) to pay all the bills that come in?				

MEAN	SD	RANGE	ALPHA	N
9.7	3.5	6-24	.82	284

*SOURCE: L. Pearlin and C. Schooler (1978)

Two items were adapted from Pearlin and Schooler (1978) and four additional items were developed by the author. Each item was measured along a 4 point scale ranging from "never happens" to "happens very often". Response values were reversed such that increasing scores indicate increasing financial difficulty. Again, all six items were scored in the same direction allowing for the possibility of a response bias. However, an examination of the individual item variation as well as the variation in the summary score suggested this possibility was unlikely. The distribution for financial stress is presented in Table F.15.

The internal reliability of this scale, assessed using Cronbach's alpha was .82. This scale is believed to have face validity as a measure of financial stress. For the study group, the financial stress score ranged from a low of 6 to a high of 24 with a mean of 9.8 (sd=3.5).

6.12 Personal Resources

Personal resources are those aspects of self or personality that may be called upon to assist an individual when confronted by threatening or challenging life circumstances (Pearlin and Schooler, 1978; Pearlin et

al., 1981). Personal competence and self esteem have been chosen as elements of personal resources to be examined in this research. Personal competence and self esteem were selected from the domain of personal resources which includes other factors such as locus of control, mastery, self-denigration and a wide range of personality characteristics. The choice of self esteem was based upon the research literature, reviewed in Chapter 4, identifying it as an important aspect of self likely to mediate between stressful circumstances and adverse health outcomes (Pearlin et al., 1981). From a review of the literature, personal competence was chosen as a promising variable likely to distinguish between individuals who were able and those who were unable to act effectively on their own behalf when confronted by stressful or demanding life circumstances. Personal competence was viewed as a variable likely to mediate between stressful circumstances and adverse outcomes.

6.12.1 Personal Competence

The theoretical basis for personal competence is grounded in developmental theory. As such, the concept of competence has been most extensively considered in the literature on community mental health. However, a review of the literature revealed no reliable and valid measure

of this construct suitable to the present research. Much of the recent work on the measurement of competence has focused on the use of multiple indicators such as intelligence, scholastic performance and subjective estimates of an individual's performance obtained through interviews with a range of key informants (Phillips and Zigler, 1961; Phillips, 1967). Clearly, such approaches would have been difficult to apply in the present study. Other measures, such as Rotter's Internal/External Locus of Control (1966) and Pearlin and Schooler's Mastery scale (Pearlin and Schooler, 1978) were considered as potentially appropriate to this research. Notions of competence, such as White's (1959) acknowledge the importance of some personal mastery of the environment and responsive feedback from it for the formation of competence. However, the concept of competence and its indicators are viewed as much more global (White, 1959; Smith, 1966). Therefore, these measures were rejected in favour of a more general measure that would include indicators of abilities of self-care and interpersonal effectiveness as components of personal competence.

Given the lack of suitable survey instruments, competence was measured using a scale developed for this study by the author. A set of 14 items with face validity as indicators of ability and experience in the areas of

self care, money management and problem solving were taken from a larger pool of items after pretesting.

The pretesting of this measure was conducted on one hundred London Secondary School students from grades 10 and 11. This measure was included as a part of a self-administered questionnaire within a separate research study on risk factors and heart disease.

Three response options per item were created. If the respondent felt the item concerned a task that she could not do without help from some other person, the response was scored as 0. If the respondent felt that she could do the task without help but had never done it, the response was scored as 1. If the respondent had done the task in the past, the response was scored as 2. Increasing scores indicate increasing level of competence (Table 6.7).

A principal component analysis with varimax rotation revealed two underlying factors. The first factor to emerge explained 18.1 percent of the variance and contained variables pertaining to self or personal effectiveness. The internal reliability of this scale was .54 suggesting a marginal degree of additivity among the scale items.

TABLE 6.7

FACTOR LOADINGS AFTER VARIMAX ROTATION, COEFFICIENT ALPHA AND SUMMARY MEASURES FOR ITEMS OF THE COMPETENCE SCALE

Factor Items
Factor 1: Personal Competence — Factor Loadings

Item No.	Item Description	Factor 1	Factor 2
1	prepare a [illegible]	.439	.070
2	do some household tasks	.599	-.098
3	sew on some buttons	.493	.052
4	shop carefully for food	.537	.307
7	care for a young child	.525	.011
8	shop carefully for clothes	.455	.137
13	communicate feelings to friends	.407	.101

MEAN	SD	RANGE	ALPHA	N
12.2	1.8	0-14	.54	284

Factor Items
Factor 2: Social Competence — Factor Loadings

Item No.	Item Description	Factor 1	Factor 2
5	plan and stick to a budget	.387	.298
9	supervise a small group	.569	.078
10	fill in complex forms	.610	.145
11	handle a job interview	.763	-.066
12	communicate problems to my supervisor	.534	.049

MEAN	SD	RANGE	ALPHA	N
7.4	1.9	0-10	.55	284

Items Dropped From Competence Scale

6	move on short notice	.272	.239
14	bring family members together	.260	.059

Summary Measure
Competence
12 items

MEAN	SD	RANGE	ALPHA	N
19.6	3.1	0-24	.63	284

The second factor contained five items suggesting a dimension of social effectiveness and explained 9.8 percent of the variance. This scale also demonstrated rather low internal reliability (alpha=.55). Two items that did not load satisfactorily on either factor were further evaluated and found to have weak inter-item correlations with other scale items. These items were not included in the final summary score for competence. Based upon the generally accepted level for internal reliability of .6, it was decided to use the summary scale of 12 items as an overall measure of personal competence (Cronbach, 1951). This measure had a satisfactory reliability of .63. For the study group, a summary score for personal competence was created. This score ranged from 9 to 24 with a mean of 19.5 (sd=3.1). The distribution for personal competence is presented in Table F.21.

6.12.2 Self Esteem

Self esteem was measured using the 6 item Rosenberg Self Esteem Scale (Rosenberg, 1979) used by Pearlin and Schooler (1978) in their study of stress and coping in a community sample. The scale was originally developed for use with high school students. The main sample reported by Rosenberg (1965) consisted of 5,024 high school students

TABLE 6.8

COMPONENT ITEMS, STANDARDIZED ITEM ALPHA AND SUMMARY MEASURES FOR SELF ESTEEM (ROSENBERG)

Scale Items:	Agree				Disagree
a) I feel that I have a number of good qualities.	1	2	3	4	5
b) I feel that I am a person of worth at least on an equal plane with others.					
c) I am able to do things as well as most other people.					
d) I take a positive attitude toward myself.					
e) On the whole I am satisfied with myself.					
f) All in all, I am inclined to feel that I am a failure.					

MEAN	SD	RANGE	ALPHA	N
25.3	4.3	6-30	.85	284

from 10 randomly selected schools in New York City. This instrument was chosen because of its theoretical underpinnings as a measure of positive self regard, its ease of administration (less than two minutes to complete) and its self report nature. Respondents were asked to rank themselves on a 5 point likert scale that ranged from "strongly agree" to "strongly disagree". For the purposes of analysis, the first five items of this scale have been recoded with low scores indicating low self esteem and high scores indicate high self esteem (Table 6.8).

The formal properties of this scale have been widely published (Rosenberg, 1979). The internal reliability of this scale, assessed using Cronbach's alpha was very satisfactory (.85). Test-retest reliability estimates over a 14 day period of .85 have been reported by Silbert and Tippett (1965). For the study group, a summary score for self esteem was computed and used in analysis. The score ranged from a low of 9 to a high of 30 with a mean of 25.7 (sd=4.7). The distribution for self esteem is presented in Table F.20.

6.13 Other Risk Factors

Five separate variables, prenatal care, drinking, smoking, weight gain and pregravid weight were arranged

under the heading other risk factors. Each variable within this cluster is described and used separately in analysis. Distributions for these variables may be found in Appendix F.

6.13.1 Pregravid Weight and Weight Gain

Pregravid weight, measured in kilograms, was obtained from both the hospital chart and from the respondent at the initial interview. Where pregravid weight was missing, the respondent's self report of prepregnancy weight was used. For the study group, the average pregravid weight was 55.8 kilograms (sd=8.4) and ranged from 37.7 to 94.1 kg. The distribution for pregravid weight is presented in Table F.22.

The respondent's weight at delivery ranged from 41.8 kg to 98.6 kg with an average of 66.7 kg (sd=18.2). The average weight gain, computed as the difference between weight at delivery and pregravid weight, was 14.9 kg (sd=5.6, N=204). For 10 respondents, weight at delivery was missing from the hospital chart. To preserve the number of cases available for analysis, the mean weight gain was substituted for the missing values. The implications of mean substitution for missing data is discussed in Chapter 9.0 (Section 9.2).

There was a single instance of weight loss rather than gain noted for this sample. This situation involved a respondent with a pregravid weight of 61.4 kg and a total weight loss at delivery of 1.4 kg. The distribution for weight gain is presented in Table F.23.

6.13.2 Smoking

Smoking was assessed using items adapted from the Canada Health Survey (1977:80). Questions used to measure smoking behaviour are found in Appendix D.

Approximately 61 percent of the sample identified themselves as current smokers with a mean smoking duration of 4.4 years. Smoking cessation while pregnant was reported by approximately 5 percent of the study group and the remaining 34 percent reported never having smoked cigarettes (Table F.1). Given the the possibility of a long term effect of smoking even after quitting, subjects who reported smoking cessation after becoming aware of their pregnancy were considered smokers in all analyses.

The measure of smoking used in most analyses is presented in Table F.1. This measure was dichotomized as never smoked (coded as 0) and ex-smoker/current smoker (coded as 1). This was a self-report measure and as such

may be subject to misrepresentation, particularly if the respondent feels smoking was an undesirable behaviour. Although the possibility of smoking misrepresentation can not be ruled out entirely, it was viewed as an unlikely occurrence in this investigation for two reasons. First, misrepresentation would likely take the form of under-reporting the use of tobacco. Thus by comparison to other Canadian teenaged females, one would expect the study group to have a comparatively larger proportion of non-smokers. Using information on smoking behaviour from the Canada Health Survey (1978; Table 11) the study group actually had a slightly lower proportion of non-smokers (study group non-smokers = 34.3%; Canada Health Survey, females, 15-19 = 38.4% non-smokers).

Secondly, other investigations of smoking behaviour have found self report measures of smoking to be a highly reliable estimate. One prospective, longitudinal study on cannabis and soft drug use among pregnant women currently being conducted at Carleton University in Ottawa finds no evidence to suggest that women lie about cigarette smoking or about alcohol or cannabus use (personal communication, P.A. Fried). Therefore, reasonable confidence is warranted in the self-report measure of smoking used in this study.

6.13.3 Alcohol Consumption

Alcohol consumption was also measured using items adapted from the Canada Health Survey (1977:82) and may be found in Appendix D. Information about the number of ounces of alcohol consumed per week was captured by these items. The most common alcoholic beverage was beer with one bottle equalling 12 ounces. Alcohol use among respondents was very low with 90 percent of the sample identifying themselves as non-drinkers (Table F.2).

Among the 10 percent who reported alcohol use, the average duration was 4.2 years. Approximately 3 percent of the total sample reported abstinence while pregnant. Investigations of fetal alcohol syndrome provide evidence of an effect of alcohol in mothers who were drinkers but remained abstinent for the period of their pregnancy (Vitez et al., 1984). For the purposes of analysis, alcohol consumption was dichotomized with non-drinkers coded as '0' and ex-drinkers and current drinkers coded as '1'.

Again, the self report nature of the questions on drinking behaviour may lead to concerns about misrepresentation. As noted for smoking, alcohol

consumption is, for the most part, a consistent behaviour likely to be recalled with a fair degree of accuracy. Also, no evidence has been found from other research of a similar nature to support the notion that pregnant women are likely to lie about their alcohol consumption (P.A. Fried, personal communication).

6.13.4 Prenatal Care

Recent studies have noted an important association between prenatal care and favourable pregnancy outcomes (Placek, 1972; Stickle and Ma, 1973; Sokol et al., 1980; Showstack et al., 1984; Geronimus, 1986). While there appears to be agreement among researchers as to the beneficial effects of prenatal care, there is noticeable divergence in the measurement of prenatal care.

The categorization of prenatal care reported in the literature ranges from a simple dichotomy (none vs. some care) to sophisticated life table analysis. Also, attention has been drawn to the role of length of gestation, particularly when prenatal care has been measured as the number of physician visits (Stanley, 1978). This was a particularly important issue since prenatal visits was used as a measure of prenatal care and it was an objective of this study to examine the influence of prenatal care on length of gestation.

Schwartz and Vineyard (1965) and Terris and Glasser (1975) used a modified life table analysis to control for the association between the number of prenatal visits and the length of gestation. Although this approach does achieve the goal of controlling for length of gestation, it was not amenable to inclusion in multivariate analyses.

Drillien (1957) and others have used week or month of the first physician visit as a measure of the adequacy of prenatal care. Such a measure does eliminate the problem of control for length of gestation, since number of visits does not enter into its construction. However, such a measure may classify some individuals as having adequate care, when care was initiated early but was subsequently irregular.

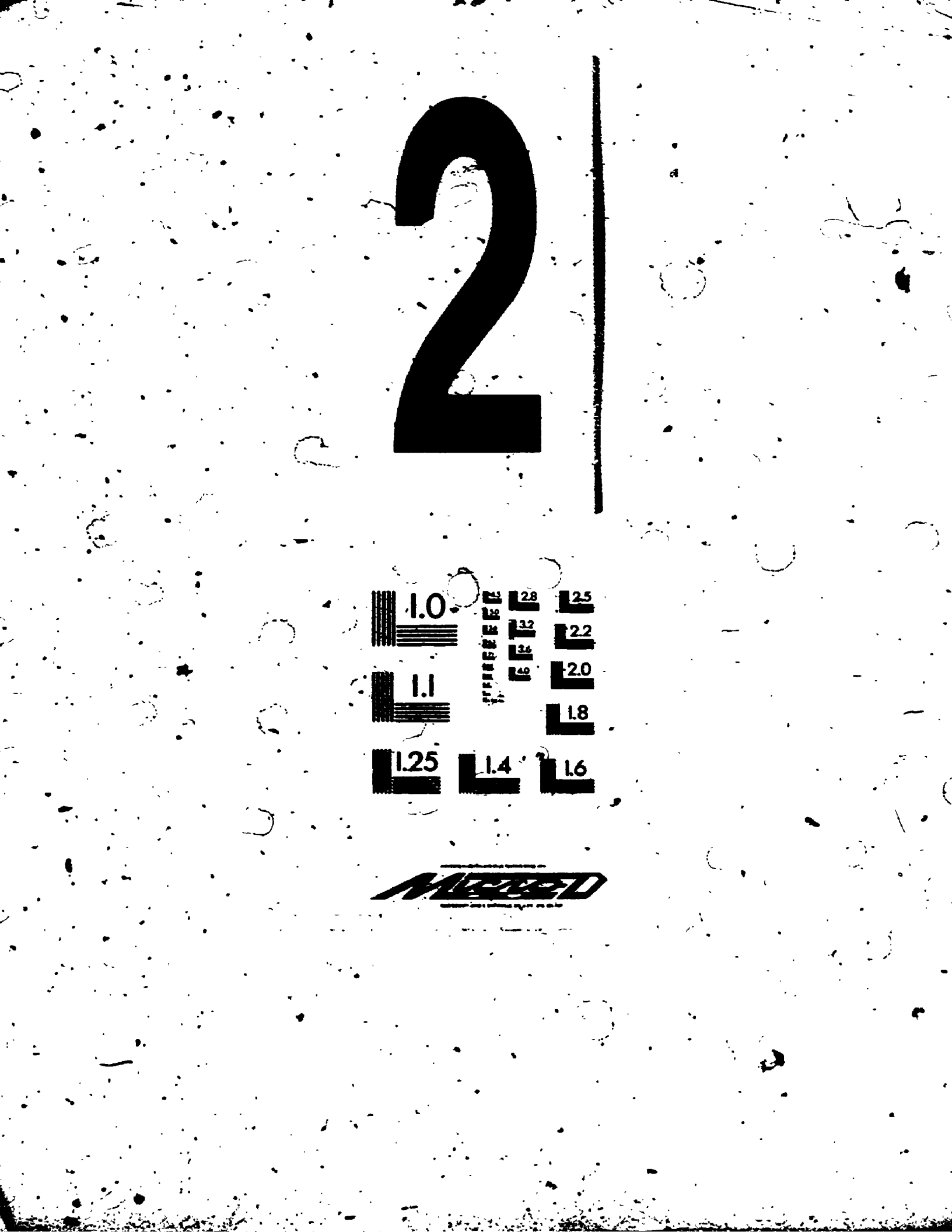
To adjust for the influence of gestation when measuring prenatal care through physician visits, Terris and Gold (1969) used a measure incorporating the expected number of prenatal visits for a given length of gestation based on the recommended visitation schedule of the hospital in their study. A ratio of observed to expected numbers of visits was then calculated.

The methods for categorizing prenatal care reviewed above adjust for the influence of length of gestation on prenatal care. However, measures that depend wholly on week of first attendance (eg. Drillien, 1957) as noted earlier, miss the potentially important information contained in the number of visits made by the respondent, while measures such as that of Terris and Gold (1969) introduce an element of idiosyncrasy or non-comparability through the use of a hospital-specific visitation schedule. Given these considerations, a measure of prenatal care that makes maximum use of all available data, controls for the influence of length of gestation and is based on a widely accepted definition of appropriate prenatal visitations was needed for this study.

The measurement of prenatal care employed by Showstack et al. (1984) appears to meet these requirements. This measure, not only uses all available information but is based on criteria of prenatal visitation developed by the Institute of Medicine in the United States (Showstack et al., 1984:1008). Prenatal care, by this measure, is categorized as adequate, inadequate or intermediate based upon the combination of number of visits, length of gestation and trimester of

first attendance. For example, a case would be coded as "adequate care" if, care was initiated in the first trimester and if, for a given length of gestation - such as 31 weeks, the number of prenatal visits made was equal to or greater than 6. By contrast, a case would be classified as "inadequate care" if, care was initiated in the third trimester or where the number of completed visits was less than the number specified for a given length of gestation. For example, prenatal care would be scored as "inadequate" if a subject made two or fewer visits at 31 weeks gestation. Intermediate care is composed of cases not included in either the adequate or inadequate category. An example of intermediate care would be 3 to 5 visits completed at 31 weeks gestation. The scoring of this variable may be found in Table F.25.

This measure of prenatal care was used by Showstack and his colleagues in their analysis of 18,470 birth records from California's Maternal and Child Health Data Base. These investigators examined the influence of prenatal care and length of gestation on infant birth weight. The results showed adequate prenatal care to be associated with an average birth weight increase of 98 grams after controlling for gestation in analysis (Showstack et al., 1984).


2
1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY

The measure of prenatal care used in this study was taken from the work of Showstack and his colleagues. This measure controls for the influence of gestational length when calculating prenatal care as a composite of the number of physician visits over the course of the pregnancy. The distribution for prenatal care is presented in Table F.3. Since only a few cases (8 cases, 3.9%) fell into the intermediate category, the categories of intermediate and inadequate prenatal care were combined, a strategy used by Showstack et. al. (1984). The dichotomous variable of prenatal care was therefore used in all analyses.

A final consideration in the measurement of prenatal care concerns the use of self-reported number of prenatal visits. Information on the number of prenatal visits recorded in the doctor's office was available for a subset of 49 study respondents. For this subgroup of 49 respondents, information on the progress of the pregnancy was recorded at each physician visit on the Ontario Antenatal Form and enclosed in the mother's hospital record. The adequacy of self-reported prenatal visits as a measure of the actual number of prenatal visits was examined within this subgroup. The mean of the actual number of visits made, as recorded on the antenatal form,

and the mean of the self-reported number of visits was compared using a paired t-test. The results of this analysis showed the mean difference was not statistically significant ($t=-0.78$, $p=0.44$). Therefore, it may be concluded that the self-reported number of visits was an acceptable measure of physician visits and may be used in the construction of the variable, prenatal care, as outlined.

6.14 Social Class of Origin

The young woman's social class of origin, as determined from her father's occupation was used to index social class position in this research. In cases of an absent father, social class was determined from her mother's occupation. Sufficiently detailed occupational information could not be obtained from the respondent with satisfactory reliability to make use of the Blishen Occupational Coding Scheme. In general, these young women lacked even the most basic information on the nature of their father's job or how long he had been employed. Therefore, occupation was coded using the Hollingshead classification scheme (1965). This widely used index of social class position provides an ordinal measure that ranges from 1 to 7.

Approximately 41 percent of the sample was classified in the lowest two of the seven categories which included semi-skilled and unskilled workers. The middle categories included minor professionals, owners of small businesses and clerical workers and accounted for the largest proportion of the sample (49.7%). The upper two categories contained executives, business managers and large business owners and accounted for the fewest cases (9.5%). The distribution for this variable is presented in Table F.4.

6.15 Marital Status

Marital status for this group fell into three categories: those who were not married and had never been married; those who were married to the father of the baby; and those who were living with but not married to the baby's father. For the purposes of this study, marital status was dichotomized into not married (68.1%), coded as 0 and married (31.9%), coded as "1". The distribution for this group on marital status is presented in Table F.5.

6.16 Length of Gestation

Length of gestation and infant birth weight were the dependent variables. Approximately 85 percent of the births to this study group took place at either St. Joseph's or Victoria Hospitals in London, Ontario. The rest of the study births were distributed across out-of-

town hospitals, primarily St. Thomas and Strathroy. Measurement of the length of gestation at Victoria and St. Joseph's hospital was conducted in a similar manner. Information on the measurement of gestational age was obtained from two established obstetricians at each of the two London hospitals. Length of gestation was calculated from the date of the last true menstrual period, using a 28 to 30 day cycle. Emphasis was placed on obtaining a detailed medical and menstrual history, particularly if the woman had conceived while using contraceptives or was unsure of her last true menstrual period. Ultra-sound was used in less than 50 percent of all such cases. When there was uncertainty about the date of the last menstrual period, a determination of gestational age was made through a clinical assessment conducted by a pediatrician using the Dubowitz scoring system. The Dubowitz scoring system is considered to yield an estimate of gestational age within a range of two weeks (Blidner et al., 1984).

Length of gestation, expressed in completed weeks was taken from the subject's hospital record. It was intended that information about the method used to estimate gestational length (ie. whether by clinical assessment of the neonate or by menstrual dates) would be collected. However, when the hospital records were examined, it became clear that the method used to estimate the length

of gestation was stated in only a few cases. Therefore, a distinction between the two methods could not be made. The mean length of gestation was 39.4 weeks (sd=1.9).

The distribution of length of gestation may be found in Table F.6. Preterm births of 36 weeks or less occurred in 6.4 percent of the study group. Post term births of 42 weeks or more were recorded in 5.4 percent and term births occurred for 88.2 percent of the respondents.

6.17 Infant Birth Weight

Infant birth weight, taken at delivery and expressed in grams was abstracted from the infant's hospital chart. The mean infant birth weight was 3311.7 grams (sd=538.7).

Approximately 5 percent of the infants had birth weights less than 2500 grams and less than 1 percent were below 1500 grams. Birth weights of 4000 grams or more were recorded for 10 percent of the infants. The distribution for this sample on infant birth weight, recoded into intervals of 250 grams for ease of presentation, is presented in Table F.7. For this study group, 5 percent or 10 infants had birth weights below 2500 grams. With so few subjects available, it was statistically more efficient to treat birth weight as a continuous variable.

CHAPTER 7.0

RESULTS

7.1 Introduction

Of the full sample (284) there were 204 women who met the selection criteria outlined in Section 6.3. Selected demographic features of these women and characteristics of their pregnancies will be discussed. This description is followed by a presentation of study results, organized around the research purposes and their associated questions, outlined in Chapter 5. The independent variables have been grouped into clusters under the headings of demographic, stress, support, personal resources and other. Study results are presented first for length of gestation, then for infant birth weight and finally for infant birth weight controlling for length of gestation. Tables accompanying the results are located in the text of this chapter or where specified, in Appendix F.

7.2 Demographic Characteristics of the Sample

Although subjects were recruited as soon as possible after the confirmation of pregnancy, consent to participate was not immediately secured in every case.

Thus, 68.1 percent were interviewed by the end of the second trimester and 31.9 percent were interviewed early in the third trimester (Table F.8).

The average age of the teenagers at the time of the first interview was 17.5 years with the youngest aged 15 and the oldest aged 20 years (Table F.9). Age was taken as age at interview. Women aged 20 years satisfied the selection criterion of 19 years at conception. The distribution of maternal age for the study group did not differ significantly from the distribution of maternal age for the population of teenage mothers resident in Middlesex County (see Appendix B). Maternal age was used as a continuous variable in all analyses, unless otherwise specified.

The average grade successfully completed by the study group was 10. Approximately 11 percent of these young women completed grade 8 or less and 6.4 percent had some post secondary education (Table F.10).

At the time of the first interview, 53.9 percent of the study group were students. Approximately 22 percent were working either full or part time and 24 percent were not working and not in school (Table F.11).

Approximately 68 percent of these young women were single at the time of interview (Table F.5). The distribution of marital status for the study group did not differ significantly from the distribution of marital status in the population of teenage mothers, resident in Middlesex County (see Appendix B).

While income in dollars was not asked, sources of income were obtained. Respondents were asked to rank all sources of income, in terms of dollar value, from most to least important. The most frequent source of income identified was government cheques, primarily family benefits allowance. Wages were the second most frequently identified income source (Table F.12).

7.2.1 Selected Characteristics of the Pregnancy and the Neonate

The majority (84.8%) of these young women were admitted in normal labour. Approximately 13 percent of the deliveries were by cesarean section and 1 percent were breech deliveries. Delivery characteristics of this group were compared to those of a similar sample reported on by Grindstaff and Riordan (1983). Using information abstracted from approximately 1600 records of teenage women delivering in two London, Ontario hospitals from

1970 to 1979, these investigators reported that 17 percent of the births sampled were by cesarean section and 2 percent were breech. This study group does not appear to differ meaningfully from the community sample of Grindstaff and Riordan (1983) at least with respect to delivery characteristics.

Of the 204 infants, 54.4 percent were male and 45.6 percent were female. Infant gender distribution was within expectation based upon information provided by The Ontario Ministry of Health (see Appendix B).

Approximately 14 percent of the newborns had one minute apgar scores of 6 or less, dropping to only 2 percent with such a score at five minutes. The average length of hospital stay was 5.9 days for mother and 6.2 days for the infant.

The majority of infants were discharged home with the mother (83.3%) in satisfactory health. Approximately 13 percent were discharged to adoption services. Again, comparisons between these results and those reported by Grindstaff and Riordan (1983) revealed no substantial differences. Further comparisons between this sample and the population of parturient teenagers in Middlesex County are presented in Appendix B.

7.3 Bivariate Associations for Independent Variables With Length of Gestation

Both the correlation ratio, Eta, and the zero order correlation coefficient have been used, where appropriate, to measure the strength of the association between the independent variables and the dependent variables, length of gestation and infant birth weight. Prenatal care, marital status, smoking and drinking status were used as dichotomous variables in this study and therefore were not appropriate for the calculation of a Pearson Correlation Coefficient. Analysis of variance was used to examine the relationship of these variables with all other study variables. From the analysis of variance the correlation ratio, eta, was obtained. Eta is based on the ratio of the explained sum of squares to the total sum of squares and is directly analogous to the Pearson Correlation Coefficient, except for the lack of a sign. The results are presented in Tables 7.1. and 7.2. Bivariate associations for the length of gestation are considered first. Based on the correlation ratio (Table 7.1), the strongest relationship was found for prenatal care with adequate prenatal care related to length of gestation. Increased alcohol consumption was associated with decreased length of gestation. Cigarette smoking was not significantly related to gestation. The association of

TABLE 7.1

CORRELATION RATIO (ETA) FOR INDEPENDENT VARIABLES WITH LENGTH OF GESTATION

VARIABLES	LENGTH OF GESTATION
Prenatal Care	.19
Marital Status	.12
Drinking Status	.14
Smoking Status	.02

NOTE: (1) A correlation ratio of .14 or greater was significant at the .05 level.

(2) Eta is directly analogous to the Pearson Correlation Coefficient except for the absence of a sign.

(3) Prenatal care: 0=inadequate, 1=adequate

Marital Status: 0=never married, 1=married*.

Drinking Status: 0=never drank, 1=former/current drinker

Smoking Status: 0=never smoked, 1=former/current smoker

* Note: Married included those subjects living in a commom-law relationship.

TABLE 7.2

ZERO ORDER CORRELATIONS FOR INDEPENDENT VARIABLES WITH LENGTH OF GESTATION

VARIABLES	LENGTH OF GESTATION
Maternal Age	-.08
Social Class	-.01
Weight Gain	.26
Pregravid Weight	.05
Life Event Stress	-.07
Pregnancy Stress	-.04
Financial Stress	.00
Father Support	-.10
Mother Support	-.05
Partner Support	.03
Friend Support	-.13
Self Esteem	-.01
Personal Competence	-.03

NOTE: (1) Correlation coefficients of .13 or greater were significant at the .05 level.

(2) Social class is coded as 1=highest through 7=lowest using the Hollingshead Scale.

maternal age (Table 7.2) and marital status (Table 7.1) with length of gestation was not statistically significant.

Perceived support from friends was negatively associated with gestation (Table 7.2). The direction of this relationship was contrary to that hypothesized. The relationship was weak and is considered further in subsequent analysis. Weight gain was positively related to length of gestation (Table 7.2).

7.4 Independent Variables and Length of Gestation

A primary purpose of this research was to examine relationships between socio-environmental factors and the study outcomes of length of gestation and infant birth weight. Independent variables were arranged in five clusters and the relationship between each cluster and length of gestation was evaluated separately.

The first research question concerned the nature of the relationship between the independent variables and length of gestation. Multiple regression analysis was used to determine how much variation in the dependent measure could be accounted for by each cluster of independent variables. Therefore, five separate regression analyses

were computed. For convenience, the results of these separate analyses are presented together in Table 7.3. For this exploratory level of analysis, a significance criterion of .10 was chosen and applied to the five analyses presented in Table 7.3.

A significance criterion of .10 was chosen because of the exploratory nature of the analysis at this stage of the research. The p value of .10 is widely used as a screening criterion and appropriate when the intent is to reduce strong constraints thereby allowing comparatively weaker variables an opportunity to contribute to the analysis. By choosing a more liberal significance level, variables with weaker associations are retained for consideration in subsequent analyses, thereby avoiding the possibility of overlooking potentially relevant variables through their exclusion at a preliminary analytical stage.

The demographic cluster accounted for 3.0 percent of the variation in gestation. Marital status was strongly and positively associated with outcome, with married women having longer gestations. Although not significantly associated with gestation in a bivariate analysis, age achieved statistical significance at the .10 level, with older women having shorter gestations.

TABLE 7.3

MULTIPLE REGRESSION OF LENGTH OF GESTATION ON DEMOGRAPHIC, STRESS, SUPPORT, RESOURCES AND OTHER VARIABLES

VARIABLES	b	S.E.	BETA
DEMOGRAPHIC			
Maternal Age	-.18	.11	-.12*
Marital Status	.64	.32	.15**
Social Class	-.01	.09	-.01
F Ratio=1.75	p=.16	R^2=.027	N=192
STRESS			
Life Event	-.04	.03	-.11
Pregnancy	.03	.04	.07
Financial	-.00	.04	-.00
F Ratio=0.74	p=.53	R^2=.012	N=192
SUPPORT			
Father	-.01	.01	-.10
Mother	-.00	.01	-.00
Partner	.02	.03	.04
Friend	-.05	.03	-.15*
F Ratio=1.55	p=.18	R^2=.032	N=192
RESOURCES			
Self Esteem	.00	.03	.01
Personal Competence	-.02	.05	-.03
F Ratio=0.11	p=.89	R^2=.001	N=192
OTHER			
Prenatal Care	.99	.34	.20**
Drinking	-1.10	.46	-.17**
Weight Gain	.10	.02	.28**
Pregravid Weight	.00	.02	.02
Smoking	-03	.28	-.01
F Ratio=6.50	p=.00	R^2=.148	N=192

* P < .10 ** P < .05

NOTE: Multiple regression with block entry

The support cluster accounted for 3.0 percent of the variance in gestation. Among the four variables, only perceived support from friends was marginally and negatively associated with outcome. The direction of this association was unexpected. It was hypothesized that increased levels of support would be associated with increased, and not decreased, length of gestation. However, the relationship was weak and may be a chance occurrence.

The stress cluster was only weakly associated with length of gestation, explaining 1.0 percent of the variance in outcome. The personal resources cluster made up of self esteem and personal competence was not related to length of gestation.

The largest proportion of variance in outcome was accounted for by the other cluster (15%). Of the five variables, prenatal care, weight gain and alcohol consumption were significantly related to length of gestation.

Both age and marital status have been identified in other research as correlates of pregnancy outcomes. However, the ways in which these factors influence outcome is not completely understood. Therefore, a second research

question addressed here considers possible explanatory roles for other variable groups in the relationship between demographic factors and length of gestation.

Using multiple regression analysis to simultaneously control variation in the demographic variables, each of the remaining independent variable groups was introduced into the model. Their association with length of gestation and with the demographic factors already in the analysis was examined. The results of these analyses are presented in Tables 7.4 through 7.7. Again, a less stringent criterion of significance of .10 was chosen.

The association between the demographic cluster and length of gestation with the stress variables in the model was examined first. With the entry of the stress cluster, two things were noticed (Table 7.4). First, stressful life events achieved marginal statistical significance at the .10 level. Second, the relationships of both marital status and age to outcome were retained. Together these variables accounted for 4.7 percent of the variance in gestation.

No change in the relationship between the demographic factors and length of gestation was noted when the support

cluster was added to the model (Table 7.5). This was also true when the personal resources cluster was added to the model (Table 7.6).

However, the addition of the other cluster to the model produced important changes in the relationship between the demographic factors and length of gestation (Table 7.7). The unstandardized partial regression coefficient (b) for marital status was reduced by 31 percent (see Table 7.3) and became non-significant. Similarly, the b value for age was reduced by 44 percent (see Table 7.3) and was also no longer significant. It appears that maternal age and marital status influence length of gestation indirectly through their association with prenatal care, weight gain and alcohol consumption. That is to say, these three variables may intervene in the relationship between the demographic factors and length of gestation. The total variance accounted for by this combination of variables was 16 percent.

At this stage in the analysis, two objectives have been met: first, an evaluation of the association between the independent variable clusters and length of gestation has been carried out; and second, the determination of a possible explanatory or intervening role for the independent variable clusters in the relationship of age

TABLE 7.4

MULTIPLE REGRESSION OF LENGTH OF GESTATION ON DEMOGRAPHIC CLUSTER WITH STRESS VARIABLES IN THE MODEL

	VARIABLES	b	S.E.	BETA
DEMOGRAPHIC				
	Age	-.22	.11	-.14*
	Marital Status	.74	.32	.17**
	Social Class	-.03	.09	-.02
STRESS				
	Life Event	-.04	.03	-.13*
	Pregnancy	.05	.04	.11
	Financial	.01	.04	.01

F Ratio=1.53 p=.17 R^2=.047 N=192

* p < .10
** p < .05

NOTE: Multiple regression with block entry.

TABLE 7.5

MULTIPLE REGRESSION OF LENGTH OF GESTATION ON DEMOGRAPHIC CLUSTER WITH SUPPORT VARIABLES IN THE MODEL

	VARIABLES	b	S.E.	BETA
DEMOGRAPHIC				
	Age	-.16	.11	-.11*
	Marital Status	.66	.36	.15*
	Social Class	-.02	.09	-.01
SUPPORT				
	Father	-.02	.01	-.10*
	Mother	-.00	.01	-.00
	Partner	-.01	.03	-.03
	Friend	-.04	.02	-.12*
	F Ratio=1.50	p=.17	R^2=.054	N=192

* p < .10
** p < .05

NOTE: Multiple regression with block entry.

TABLE 7.6

MULTIPLE REGRESSION OF LENGTH OF GESTATION ON DEMOGRAPHIC CLUSTER WITH PERSONAL RESOURCES IN THE MODEL

VARIABLES	b	S.E.	BETA
DEMOGRAPHIC			
Age	-.18	.11	-.12*
Marital Status	.65	.32	.15**
Social Class	-.01	.09	-.01
RESOURCES			
Self Esteem	-.00	.02	-.01
Personal Competence	-.02	.05	-.03

F Ratio=1.09 p=.37 R^2=.028 N=192

* p < .10
** p < .05

NOTE: Multiple regression with block entry.

TABLE 7.7

MULTIPLE REGRESSION OF LENGTH OF GESTATION ON DEMOGRAPHIC CLUSTER WITH OTHER VARIABLES IN THE MODEL

VARIABLES	b	S.E.	BETA
DEMOGRAPHIC			
Age	-.10	.11	-.06
Marital Status	.44	.31	.10
Social Class	-.05	.09	-.04
OTHER			
Prenatal Care	.93	.34	.19**
Weight Gain	.10	.02	.28**
Drinking	-.94	.46	-.14**
Smoking	-.02	.29	-.01
Pregravid Weight	.02	.02	.02
F Ratio=4.38	p=.0001	R^2=.160	N=192

* p < .10
** p < .05

NOTE: Multiple regression with block entry.

and marital status with length of gestation has been completed. The next step will consider the ways in which relationships may be influenced by the introduction of all study variables into analysis.

Using multiple regression with block entry, independent variable sets were entered and retained in analysis. The results are presented in Table 7.8. At each step, both the standardized partial regression coefficients and the cumulative explained variance were examined. The criterion for statistical significance when assessing the regression coefficients was .10.

The support cluster was included in the model after the demographic and the stress clusters. At that point, the relationships of marital status and age with outcome were unchanged. However, a slight increase in the relationship of life event stress and length of gestation was noted.

The personal resources cluster was then added. No meaningful increment to the explained variance in outcome was achieved by including personal resources in the model. Together the demographic, stress, support and personal resources clusters accounted for 7.6 percent of the explained variance in length of gestation.

TABLE 7.8

SUMMARY FOR FIVE SEPARATE MULTIPLE REGRESSIONS OF LENGTH OF GESTATION ON DEMOGRAPHIC, STRESS, SUPPORT, PERSONAL RESOURCES AND OTHER VARIABLES

VARIABLES	b	S.E.	BETA	b	S.E.	BETA	b	S.E.	BETA	b	S.E.	BETA	b	S.E.	BETA
Age	-.18	.11	-.12*	-.22	.11	-.14*	-.20	.11	-.13*	-.20	.11	-.13*	-.13	.11	-.09
Marital	.64	.32	.15*	.74	.32	.17*	.73	.32	.17*	.72	.32	.17*	.55	.32	.13
Class	-.01	.09	-.01	-.03	.09	-.02	-.02	.09	-.02	-.02	.09	-.00	-.05	.09	-.04
R^2=.027 F=1.75 p=.16															
Life Event Stress				-.04	.03	-.13*	-.05	.03	-.16*	-.05	.03	-.15*	-.05	.03	-.15*
Pregnancy Stress				.05	.04	.11	.04	.04	.08	.04	.04	.09	.04	.04	.09
Financial Stress				.01	.04	.01	-.01	.04	-.02	-.01	.04	-.02	-.01	.04	-.02
R^2=.047 F=1.53 p=.17															
Father Support							-.02	.01	-.11*	-.02	.01	-.11*	-.02	.01	-.12*
Mother Support							-.00	.01	-.03	-.00	.01	-.04	-.01	.01	-.07
Partner Support							-.01	.03	-.03	-.01	.03	-.02	-.02	.03	-.02
Friend Support							-.04	.03	-.12*	-.04	.03	-.12*	-.04	.03	-.09
R^2=.075 F=1.49 p=.15															
Self Esteem										-.01	.03	-.03	-.00	.03	-.00
Personal Competence										-.01	.05	-.01	-.01	.04	-.02
R^2=.076 F=1.24 p=.26															
Prenatal Care													.92	.35	.19**
Weight Gain													.10	.02	.31**
Drinking													-1.10	.46	-.16**
Smoking													-.01	.29	-.01
Pregravid Weight													.01	.02	.01
R^2=.219 F=2.89 p=.00															

NOTE: (1) Multiple regression with block entry * p < .10 ** p < .05

Finally, the other cluster was included in the model. As anticipated, the association of age and marital status with length of gestation disappeared with the addition of prenatal care, weight gain and alcohol consumption. The relationship between stress and gestation remained the same. The association between friend support and length of gestation observed earlier was no longer significant. Perceived support from father achieved statistical significance. All study variables, taken together, accounted for 21.9 percent of the variance in length of gestation.

The results presented in Table 7.8 provided an opportunity to examine the effect of the demographic, stress, support and personal resources variables on length of gestation after taking into account prenatal care, alcohol consumption and weight gain. With the entry of prenatal care, weight gain and alcohol consumption together in the model, both age and marital status were no longer associated with gestation. However, the association between stressful life events and length of gestation remained significant. Thus, it appears that age and marital status influence length of gestation through their association with prenatal care, weight gain and alcohol

consumption. Whereas, the relationship of stressful life events and father support does not appear to be mediated by these three variables.

With all 17 study variables in the regression analysis, many statistically non-significant associations were noted. In order to identify the most parsimonious subset of variables significantly related to length of gestation, multiple regression analysis using backward elimination was chosen. The method of backward elimination (as opposed to forward inclusion) was chosen because it allowed for the removal of those variables that contributed the least to explained variance in length of gestation. Backward elimination begins by first entering all variables into the analysis. At subsequent steps, variables contributing the least to the explained variance were dropped from the analysis. The variables retained are then reassessed. This procedure continues as long as the probability value of the F ratio for each remaining variable is less than .05 - a more stringent criterion for statistical significance. The result of this analysis is presented in Table 7.9.

The full model consisted of 17 independent variables and accounted for 21.9 percent of the variance in length of gestation. At the final step, four variables accounting

for 18.6 percent of the explained variance were found to be significantly related to length of gestation, at the .05 level. The decrement in the explained variance was tested and found to be statistically non-significant ($F=0.565$, $p>.05$.). This test may be interpreted as an indicator of the goodness of fit with the data achieved by this parsimonious, four variable model.

As can be seen from Table 7.9, increased weight gain and adequate prenatal care were associated with increased length of gestation. Alcohol consumption was the third most important variable associated with decreased length of gestation. Over-protection from fathers as measured by the Parental Bonding Instrument was significantly associated with length of gestation. The perception of over-protection from father was associated with increased length of gestation.

For the 17 variables evaluated, four were found to be statistically significant at the .05 level. Given the number of statistical tests executed, one must consider the possibility of a chance occurrence of significance. As can be seen from Table A.2, Appendix A, with 17 tests of significance performed, the probability of four significant findings was approximately one in one hundred.

TABLE 7.9

MULTIPLE REGRESSION OF LENGTH OF GESTATION ON DEMOGRAPHIC, STRESS, SUPPORT, PERSONAL RESOURCES AND OTHER VARIABLES

VARIABLES	b	S.E.	BETA
Weight Gain	.11	.02	.29
Prenatal Care	1.03	.32	.21
Drinking	-1.10	.44	-.16
Father Support	-.02	.01	-.14

F Ratio=8.52 p=.000 R^2=.186 N=192

NOTE: (1) All variables are significant at the .05 level.

(2) Multiple regression with backward elimination.

In summary, prenatal care and weight gain were the two variables most closely related to length of gestation. The perception of father as over-protective was related to increased length of gestation. Alcohol consumption was associated with decreased gestational length.

7.5 Interactions Among the Independent Variables

Based on previous research and theoretical considerations, it appeared likely some of the independent variables in this research might have significant interaction effects with the study outcomes. Of particular interest was the possible interaction of support and stress found in other research to be significantly associated with pregnancy complications (Nuckolls et al., 1972; Norbeck and Tilden, 1983). Four interaction terms were formed by multiplying each individual support measure by life event stress. These terms were then entered after the main effects into the regression model for length of gestation. None of the interaction terms were significant. Possible explanations for the absence of interactions in this study are considered in the Discussion Section.

7.6 Independent Variables and Infant Birth Weight

Attention will now be turned to the second outcome measure, infant birth weight. A primary research objective concerned an examination of the role and significance of socio-environmental factors for birth weight.

7.6.1 Bivariate Associations For Independent Variables With Infant Birth Weight

Similar to the analysis conducted for length of gestation, bivariate associations for the independent variables with infant birth weight are presented in Tables 7.10 and Table 7.11. Only four variables were significantly related to infant birth weight at the .05 level. Weight gain and prenatal care formed the strongest association with birth weight. Alcohol consumption was associated with birth weight. Increased stress was associated with decreased birth weight. The association of marital status and maternal age with outcome was not significant (Tables 7.10 and 7.11). For this study group, smoking was not significantly associated with infant birth weight.

7.6.2 Independent Variables and Infant Birth Weight

Independent variable clusters and their separate contribution to explained variance in birth weight was evaluated through multiple regression analysis. The criterion for statistical significance at this step of analysis was .10. This level of significance was chosen to

TABLE 7.10

CORRELATION RATIO (ETA) FOR INDEPENDENT VARIABLES WITH INFANT BIRTH WEIGHT

VARIABLES	INFANT BIRTH WEIGHT
Prenatal Care	.25
Marital Status	.09
Drinking Status	.18
Smoking Status	.07

NOTE: (1) A correlation ratio of .14 or greater was significant at the .05 level.

TABLE 7.11

ZERO ORDER CORRELATIONS FOR INDEPENDENT VARIABLES WITH INFANT BIRTH WEIGHT

VARIABLES	INFANT BIRTH WEIGHT
Maternal Age	.01
Social Class	.02
Weight Gain	.31
Pregravid Weight	.11
Life Event Stress	-.16
Pregnancy Stress	-.01
Financial Stress	-.09
Father Support	.01
Mother Support	.02
Partner Support	.03
Friend Support	-.08
Self Esteem	.09
Personal Competence	.06

NOTE: (1) Correlation coefficients of .13 or greater were significant at the .05 level.

reduce the possibility of eliminating potentially important variables at a preliminary step in the analysis. For the convenience of presentation, the results of the five separate regression analyses are presented together in Table 7.12.

In the first analysis, variables within the demographic cluster were unrelated to infant birth weight. Maternal age, marital status and social class, taken together, explained less than 1 percent of the variance in outcome. As well, variables within the support and personal resources clusters were not significantly associated with the explained variance in outcome.

Although stressful life events achieved statistical significance, the stress cluster accounted for only 3 percent of the variance in birth weight. As might be expected, based on the bivariate associations, the strongest relationships with birth weight were noted for weight gain followed by prenatal care and alcohol consumption. Taken together, these variables accounted for 22.1 percent of the variance in birth weight. No relationship was found for smoking and infant birth weight. This finding was contrary to expectation and possible explanations for this result are presented in the Discussion Section.

TABLE 7.12

MULTIPLE REGRESSION OF INFANT BIRTH WEIGHT ON DEMOGRAPHIC, STRESS, SUPPORT, RESOURCES AND OTHER VARIABLES

VARIABLES	b	S.E.	BETA
DEMOGRAPHIC			
Maternal Age	-3.4	31.2	-.01
Marital Status	104.3	87.7	.09
Social Class	-5.9	24.7	-.02
F Ratio=0.49	p=.68	R^2=.008	N=192
STRESS			
Life Event	-14.7	6.8	-.16**
Pregnancy	7.5	10.0	.06
Financial	-12.1	11.3	-.08
F Ratio=1.96	p=.12	R^2=.030	N=192
SUPPORT			
Father	.99	2.9	.03
Mother	.88	2.7	.02
Partner	5.93	8.1	.05
Friend	-10.74	7.3	-.11
F Ratio=0.69	p=.59	R^2=.015	N=192
RESOURCES			
Self Esteem	7.7	6.9	.08
Personal Competence	11.5	12.7	.07
F Ratio=1.17	p=.31	R^2=.012	N=192
OTHER			
Weight Gain	31.6	6.3	.33**
Prenatal Care	328.9	86.9	.25**
Drinking	-365.9	116.6	-.21**
Smoking	-84.6	73.9	-.07
Pregravid Weight	4.5	4.2	.07
F Ratio=10.6	p=.00	R^2=.221	N=192

* P < .10 ** P < .05

NOTE: Multiple regression with block entry

Having examined the relationship of each variable cluster with birth weight, the next step was to assess the contribution of all independent variables to the explained variance in birth weight. Therefore, all independent variable clusters were added, one at a time, to the model terminating when all variables had entered. The results of this analysis are presented in Table 7.13. The criterion for statistical significance was .10.

In combination, these variables accounted for 27 percent of the variance in infant birth weight. Main effects were noted for stressful life events, prenatal care, weight gain and alcohol consumption. Of the four variables, prenatal care, weight gain and alcohol consumption were most strongly related to infant birth weight, with stressful life events following. Alcohol use and increased life stress were associated with decreased birth weight, while adequate prenatal care and increased weight gain were associated with increased birth weight.

The next step in analysis was taken to reduce the large 17 variable model to a more parsimonious model. At this point, a more stringent criterion for significance was employed. The criterion of .05 was chosen. Multiple

TABLE 7.13

SUMMARY FOR FIVE SEPARATE MULTIPLE REGRESSIONS OF INFANT BIRTH WEIGHT ON DEMOGRAPHIC, STRESS, SUPPORT, PERSONAL RESOURCES AND OTHER VARIABLES

VARIABLES	b	S.E.	BETA	b	S.E.	BETA	b	S.E.	BETA	b	S.E.	BETA	b	S.E.	BETA
Age	-3.4	31	-.01	-6	32	-.02	.03	33	.01	.07	33	.01	20	31	.05
Marital	104	87	.09	124	89	.11	108	100	.09	90	101	.08	32	91	.03
Class	-5.9	24	-.02	-14	24	-.04	-15	26	-.04	-13	26	-.04	-25	24	-.07
R^2=.008 F=0.49 P=.68															
Life Event				-15	7	-.17†	-16	7	-.17*	-14	7	-.16*	-13	7	-.15*
Pregnancy				12	10	.09	11	11	.08	12	11	.09	14	10	.11
Financial				-14	12	-.09	-16	12	-.10	-16	12	-.10	-10	12	-.06
R^2=.042 F=1.34 p=.23															
Father Support							.49	3	.01	.3	3	.01	-1	3	-.03
Mother Support							-.69	3	-.02	-1.2	3	-.03	-2	3	-.06
Partner Support							1.19	9	.01	.8	9	.01	1	8	.01
Friend Support							-10.44	7	-.10	-14.3	8	-.14*	-10	7	-.10
R^2=.053 F=1.02 p=.43															
Self Esteem										9	8	.10	6	7	.05
Personal Competence										12	13	.07	9	12	.05
R^2=.066 F=1.07 p=.39															
Weight Gain													31	7	.32**
Prenatal Care													313	91	.24**
Drinking													-398	124	-.22**
Smoking													-62	76	-.06
Pregravid Weight													4	4	.06
R^2=.27 F=3.71 p=.00															

NOTE: (1) Multiple regression with block entry * p < .10 ** p < .05

regression analysis with backward elimination was employed and the results are presented in Table 7.14.

As can be seen from the standardized regression coefficients presented in Table 7.14, weight gain showed the strongest association with infant birth weight. Prenatal care was the next variable most closely associated with birth weight. Alcohol use and stressful life events were associated with decreased birth weight. As hypothesized, increased life stress was associated with decreased infant birth weight. This final subset of four variables, prenatal care, weight gain, alcohol consumption and stress accounted for 22.5 percent of the variance in birth weight.

The decrement in the R squared term from the 17 variable model to the four variable model was tested and found to be non-significant ($F=0.825$, $p>.05$). This reduction in the explained variance by the elimination of thirteen independent variables may be considered an indicator of the goodness of fit between the reduced model and the data. The finding of four significant variables after 17 tests of significance had been executed was unlikely to have occurred by chance alone (see Appendix A).

TABLE 7.14

MULTIPLE REGRESSION OF INFANT BIRTH WEIGHT ON DEMOGRAPHIC, STRESS, SUPPORT, PERSONAL RESOURCES AND OTHER VARIABLES

VARIABLES	b	S.E.	BETA
Weight Gain	30.9	6.2	.32
Prenatal Care	333.8	85.5	.25
Drinking	-361.7	115.0	-.20
Life Event Stress	-10.9	5.8	-.12

F Ratio=13.6 p=.000 N=192 R^2=.225

NOTE: (1) All variables are significant at the .05 level.

(2) Multiple regression with backward elimination

7.7 Interactions Among Independent Variables

Based on theoretical considerations as well as findings from other studies, interaction terms for the stress and support variables were formed and evaluated. Although an interaction of stressful life events and perceived support had been hypothesized, no significant interactions were found. Some possible explanations for these findings are provided in the Discussion Section.

7.8 Infant Birth Weight Controlling For Length Of Gestation

Central to this study has been the notion that improvements in our understanding of factors bearing upon infant health may be achieved through a consideration of those variables that appeared to influence its two major predictors, length of gestation and infant birth weight. Therefore, analyses to this point have considered these outcomes separately. However, length of gestation was strongly and positively related to infant birth weight ($r = .61$, $p > .0001$). Therefore, this stage of analysis will consider the relationship between the independent variables and infant birth weight controlling for length of gestation. This allows one to determine whether a variable exerts an influence on birth weight over and

above its influence on length of gestation. Length of gestation was entered along with all other independent variables in the model with infant birth weight as the outcome measure.

Multiple regression was chosen as the statistical technique most appropriate for evaluating the influence of the study variables on birth weight while controlling for the influence of length of gestation. Length of gestation was added, with all study variables, to give a full 18 variable model for regression analysis. Backward elimination was used to exclude those variables not making a significant contribution to explained variance in birth weight. The full 18 variable model explained 47.3 percent of the variance in birth weight. Backward elimination led to a four variable model explaining 43.5 percent of the variance in birth weight. As can be seen from Table 7.15, length of gestation was most closely associated with infant birth weight. Although the strength of the association was reduced, weight gain, prenatal care and alcohol consumption were found to be significantly related to birth weight, after length of gestation was added to the model. The addition of length of gestation to the model accounted for substantially more variation in birth weight. The decrement in the explained variance was tested

TABLE 7.15

MULTIPLE REGRESSION OF INFANT BIRTH WEIGHT ON DEMOGRAPHIC, STRESS, SUPPORT, RESOURCES AND OTHER VARIABLES WITH LENGTH OF GESTATION IN THE MODEL

VARIABLES	b	S.E.	BETA
Gestation	139.4	16.1	.51
Weight Gain	17.4	5.6	.18
Prenatal Care	196.1	74.3	.15
Drinking	-221.9	99.6	-.12

F Ratio=36.1 p=.000 R^2=.435 N=192

NOTE: (1) All variables are significant at the .05 level.

(2) Multiple regression with backward elimination.

and found to be non-significant ($F=0.006$, $p>.05$). It may be concluded that the three variable model provides a good fit to the data.

7.9 Summary.

The significant relationships between the independent variables and length of gestation (Table 7.9), infant birth weight (Table 7.14) and birth weight controlling for gestation (Table 7.15) will be reviewed briefly. The relationships, presented in the tables just noted are further summarized in Table 7.16.

The variables of prenatal care, weight gain and alcohol consumption were significantly associated both with length of gestation and with infant birth weight (Table 7.9 and 7.14). In Table 7.15 where gestation was included in the model weight gain, prenatal care and alcohol consumption maintained a significant effect on birth weight. It appears that weight gain, prenatal care and alcohol consumption influence infant birth weight directly as well as indirectly through length of gestation.

Weight gain was associated with both length of gestation and birth weight. The association between weight

gain and birth weight was maintained when gestation was entered into the analysis. Length of gestation may be viewed as an intervening variable in the relationship between weight gain and infant birth weight.

Life event stress was not related to length of gestation (Table 7.9) but appeared to be associated with infant birth weight (Table 7.14). Therefore, one would not expect that controlling for length of gestation would diminish the relationship between life event stress and birth weight. However, the regression coefficient for stressful life events was only marginally smaller than in Table 7.14 (where gestation was not included) but its p value ($p=.09$) fell short of statistical significance.

Father support, measured as over-protection on the Parental Bonding Instrument, was associated with length of gestation (Table 7.9) but was not found to be significantly associated with infant birth weight for this sample. Although one might expect an indirect relationship between father support and birth weight through length of gestation, the data appear to suggest that the influence of father support is limited to length of gestation only. The following table summarizes the relationships of the independent variables to length of gestation and birth weight.

TABLE 7.16

RELATIONSHIPS OF SIGNIFICANT INDEPENDENT VARIABLES WITH LENGTH OF GESTATION AND INFANT BIRTH WEIGHT

INDEPENDENT VARIABLE	ASSOCIATED WITH LENGTH OF GESTATION	RELATIONSHIP TO BIRTH WEIGHT
Prenatal Care	yes	direct and indirect through gestation
Alcohol Consumption	yes	direct and indirect through gestation
Weight Gain	yes	direct and indirect through gestation
Father Support	yes	no association
Stressful Life Events	no	possibly direct

CHAPTER 8.0

DISCUSSION AND IMPLICATION OF FINDINGS

8.1 Introduction

The pregnancy outcomes of length of gestation and infant birth weight while closely associated are recognized as separate and important factors in infant health. Therefore, separate analyses were conducted for each outcome. As noted in Chapter 1, birth weight is the more important variable. Therefore, it was necessary to determine if those variables significantly associated with birth weight remained so after controlling for the influence of length of gestation. The primary objectives of this study have been first, a search for potential new variables that might be related to length of gestation and infant birth weight; and second, the assessment of a possible intervening role for these variables with known correlates of pregnancy outcomes. This research was, for the most part, successful in achieving these objectives. This discussion will elaborate upon the research findings.

8.2 Age and Marital Status

An objective of this study was to contribute further to our understanding of how socio-environmental variables might intervene in the relationship of age and marital

status with pregnancy outcomes. The significant association of marital status and age with length of gestation disappeared when the variables of prenatal care, weight gain and alcohol consumption were added to the model. Therefore, it seems likely that the frequently observed relationships of age and marital status with pregnancy outcome may be secondary to their associations with prenatal care, weight gain and alcohol consumption, in particular. As noted earlier, other studies have also reported no significant influence of young maternal age for pregnancy outcomes once factors such as race, parity and socio-economic status as well as prenatal care and weight gain have been taken into account (Elster, 1984).

It has been suggested in other research that age may be viewed as a marker for social rather than biological reproductive disadvantage (Morris, 1981). Such a statement assumes that age has both a biological component and a social component. This study was able to provide some evidence in support of the social component through the identification of prenatal care, weight gain and alcohol consumption as intervening variables in the relationship between maternal age and marital status with length of gestation. These findings suggest that perhaps we need to expand our view of the ways in which maternal age may influence pregnancy

outcomes. This expanded view should include an acknowledgment of a social component for maternal age.

8.3 Prenatal Care

The measure of prenatal care used in the present research was adapted from that of Showstack et al. (1984) who examined the relationship between prenatal care, length of gestation and infant birth weight. The definition of prenatal care employed in this research allows for assumptions about the direction of influence, that is, prenatal care influences length of gestation and not vice versa. While this suggests a causal relationship, it does not reveal the mechanisms through which prenatal care influenced length of gestation and birth weight.

Research has suggested that prenatal care may influence pregnancy outcomes through the early detection of potential risk factors, such as diabetes. As well, regular prenatal care provides an opportunity to monitor the pregnancy for the development of problems likely to influence outcomes, such as pregnancy-induced hypertension or anemia and to intervene early in the course of their development.

In addition to this problem-oriented function of prenatal care, it may be that other components such as education and support also influence pregnancy outcomes. Nutritional counselling may be one aspect of the educational function of prenatal care that ultimately acts to influence gestation and birth weight. Programs of prenatal care that have included components of education and support have been shown to be associated with improved pregnancy outcomes, including a decrease in the proportion of low weight births (Blondel et. al., 1987). The mechanisms through which support and education may act to influence pregnancy outcomes are, as yet, unidentified. However, it seems reasonable to speculate that education may lead to changes in behaviours such as changes in dietary habits that improve the nutritional intake of the young mother, resulting in improved pregnancy outcomes. Also, it may be that the support component of prenatal care leads to enhanced feelings of self worth and peace of mind that through some as yet unidentified physiological pathways result in improved pregnancy outcomes.

Although this study has employed a sophisticated definition of prenatal care, the quality and content of the care received has not been measured. However, it has been possible to examine other variables potentially

associated with adequate prenatal care in this study. An examination of the relationships among the demographic factors of age, social class and marital status with prenatal care was conducted. The results of this examination suggested that respondents from the lower social classes were no more likely than respondents from the middle and upper classes to receive inadequate prenatal care. This finding was contrary to results from other studies reported in the literature. However, many of those investigators have used samples with a diverse ethnic mix (often black) and samples with substantial barriers to adequate health care. The sample for this study was drawn from a predominantly white, medically well-serviced area within a universal health care system.

A significant association between marital status and prenatal care has been observed in this study, with married teenagers more likely to receive adequate prenatal care than unmarried teenagers. It may be that married teenagers experienced greater motivation to maintain scheduled physician visits for prenatal care. To the extent that marital status is associated with the desirability of the pregnancy, this too may have added to the motivation of the young woman to observe her prenatal schedule. It may also be that for married teenagers, the pregnancy was a planned event. In such circumstances, it

is reasonable to believe that the young woman would experience a level of satisfaction or happiness about the forth coming birth that may have encouraged her to take an active role in seeking and maintaining prenatal care.

Younger teenagers (15 and 16 years) were no more likely than any other age group to receive inadequate prenatal care. There is some evidence in the literature suggesting that teenagers tend to initiate prenatal care late in the pregnancy. Estimates range from a low of 20 percent (Horon et al., 1983) beginning care by the second trimester to a high of 67 percent (Graham, 1981) having sought prenatal care by that time. For this study group, approximately 76 percent initiated prenatal care within the first 8 to 10 weeks of pregnancy. This greater than expected proportion appearing early for prenatal care may be due, in part, to the way in which the study group was selected. It may be that some physicians were reluctant to refer those teenagers who appeared late for prenatal care. This likelihood was anticipated early in the research and efforts were made to remind the participating physicians that all pregnant teenagers, regardless of how late they may have attended, were eligible for study inclusion. However, the possibility remains that some proportion of those teenagers who initiated care late in their pregnancy were not approached about the study.

If this type of selection factor were operating, then one could expect the study group to differ from the population from which it was drawn with respect to birth weight. Since late or inadequate prenatal care has been reported in the literature to be associated with low birth weight, the study group would be expected to have fewer infants of low birth weight. A comparison of the proportion of low weight births (<2500 grams) between the study group infants (proportion low weight = .049) and the infants of teenage mothers in Middlesex County (proportion of low weight = .083) showed no significant differences (X^2=0.113, p>.05). Although this difference was not statistically significant, it does represent almost a two-fold increase in the proportion of low weight births in the population. Therefore, we must conclude that there is some evidence of a possible bias in the direction of a selection of early prenatal attenders.

The results of this study and those reviewed earlier strongly suggest that prenatal care is an important determinant of both length of gestation and infant birth weight. Prenatal care has been variously defined in the literature from the date of the initial prenatal visit to a simple count of the number of physician visits made by the respondent. The results of this study suggest that a

more precise measure, that adjusts for length of gestation when considering the number and timing of prenatal visits may be a more appropriate measure. This measure allows for assumptions about the direction of influence, removing the potential for the number of physician visits to become a proxy variable for length of gestation.

This measure of prenatal care fails to provide information on the quality or content of the care delivered. If accumulated findings continue to support the importance of prenatal care, then further research steps need to be taken to identify those components of prenatal care most closely associated with favourable pregnancy outcomes. Random assignment of women to groups receiving or not receiving prenatal care would be most difficult to implement. However, random assignment to a program of basic care versus the same program with an added feature (ie, nutritional education) might be one approach to identifying those components of prenatal care that matter for pregnancy outcomes.

8.4 Alcohol Consumption

Questions on drinking behaviour were adapted from the Canada Health Survey for use in this study. Alcohol consumption was found to be related to length of gestation and to infant birth weight after adjusting for length of

gestation. Beverage type has been identified in other research as a potentially important factor in improving our understanding of the ways in which alcohol may influence pregnancy outcomes. Beer was the most frequently identified beverage for this study group.

Given the significant association between alcohol consumption and both length of gestation and infant birth weight noted in this study, it would appear that more precise refinements to the measurement of the amount of alcohol consumed may be a promising area for further research. Investigations of fetal alcohol syndrome have used milliliters of absolute alcohol consumed daily (Vitez et al., 1984).

As well, the associations suggest that in addition to the current emphasis on smoking behaviour during pregnancy, alcohol consumption should also be considered. Alcohol consumption patterns vary significantly by age and sex. Drinking is a habit more often associated with young males and may be overlooked when considering young females. Approximately 50 percent of those who reported drinking alcohol were below the legal drinking age. The combined circumstances of being young and underage may lead some physicians to overlook the potential for alcohol use within this age group.

Alcohol consumption is a modifiable risk factor. However, as already noted, both age and gender need to be considered when designing programs of alcohol awareness. Programs of education and counselling tailored to the underage, female drinker may be an important component of prenatal care as well as of health care in general.

8.5 Weight Gain

Weight gain over the pregnancy was derived from the respondent's pregravid weight and her weight at term. Weight gain was found to be significantly associated with both length of gestation and infant birth weight uncontrolled for length of gestation. Once length of gestation was introduced into the model, the relationship between weight gain and birth weight was retained. It would appear that weight gain was associated with length of gestation and with infant birth weight after adjusting for length of gestation.

The direct association between weight gained and birth weight points to an important role for maternal nutrition counselling in pregnancy. Weight gain appears to be an important clinical variable that provides a non-invasive option for influencing fetal growth.

8.6 Social Support and Length of Gestation

Of the three sources of support examined in this research - parental support, support from the baby's father and from friends, only parental support was significantly related to the study outcomes. Parental support was found to be directly related to length of gestation. However, no direct or indirect relationship was observed with infant birth weight.

Within parents, a main effect was found for father only, with fathers perceived as over-protective associated with increased length of gestation. The finding of a main effect for father rather than mother was somewhat unexpected. In the event of pregnancy, it was expected that mother would be the dominant source of support and that support from mother would be associated with the study outcomes. The finding of over-protection rather then care as the influential component of parental support and father rather than mother as the source of such over-protection may reflect the different nature of the relationship between father-daughter as compared with the mother-daughter relationship. This study has defined support and its sources very specifically. Future studies may wish to include measures that address specific sources as well as kinds of support.

8.7 Stressful Life Events and Infant Birth Weight

The measurement of stress employed in this study was a count of stressful events. This study was able to detect a marginal relationship between stressful life events and birth weight not previously observed. For instance, the studies of Nuckolls et al. (1972) and Norbeck and Tilden (1983) were unable to find a direct relationship between stressful events and pregnancy complications. However, one reason for the finding of a direct effect for life event stress and birth weight in this study may be due to the fact that life events were measured after delivery when subjects had knowledge of the baby's birth weight. Although not statistically significant, this finding is encouraging of further research into the association of stressful events and pregnancy outcomes.

8.8 Summary and Conclusions

The results of this and other studies support the view that maternal age and marital status may be indicators more of social than of biological risk factors, at least with respect to the pregnancy outcomes examined within this study group. The association of these

demographic variables with length of gestation appeared to be explained by adequate prenatal care, weight gain and alcohol consumption.

Prenatal care was found to be an important variable in this study. Although the mechanisms whereby early and regular prenatal care affect birth weight and gestation are not fully explained, the importance of such care must be emphasized. Factors that influence the timing and regularity of prenatal visits would therefore be an important subject for future research. As well, the identification of components of prenatal care that are associated with favourable outcomes is deserving of further investigation. A number of studies have identified barriers to adequate prenatal care that have included low socio-economic status, rural location and direct economic constraints on access to health care. Such barriers to adequate health care have not been found in the present study. However, approximately 22 percent of the subjects were classified as receiving inadequate care. Although the obvious barrier of unaffordable health care was removed, other less obvious barriers must exist.

From the present study, it was not possible to determine if prenatal care was relatively more important for teenage women than for women in other age groups.

However, it is possible to speculate about those components of prenatal care that deserve special attention for a teenage patient. Based on the results of this study, the potential risk of alcohol consumption might be stressed within a younger obstetric patient group. Also the kinds of life circumstances that might be a source of difficulty over the pregnancy, such as being unmarried, might be considered a topic of discussion in prenatal care and referrals made, where necessary, to community-based service agencies. Future research might consider a comparison of the effectiveness of prenatal care in a teenage group versus other age groups. Information from such research might contribute to the identification of components of prenatal care that may be of greater importance to some age groups. Programs of prenatal care could then be designed to emphasize those components thought to be important for specific age groups.

Weight gain, alcohol consumption and prenatal care are, to some extent, malleable factors. Programs designed to alter or shape these variables to a health enhancing level are needed. Alcohol consumption in particular should not be overlooked. Health care providers and others, need to be made aware of the potential for alcohol use among underage females. As with smoking awareness campaigns targeted to the young smoker, so alcohol awareness

campaigns could be designed with the underage, female drinker in mind.

Some indication of the prevalence of youthful female drinking may be gained from the Canada Health Survey (1978). Approximately 52 percent of females aged 15 to 19 years old identified themselves as current drinkers. Based on information from the Canada Health Survey and the results of the present research, the youthful female drinker appears to be a substantial subgroup of the population for whom programs aimed at counter-acting the adverse health effects of alcohol consumption should be considered.

Given the prominence of smoking as a risk factor in pregnancy outcome, the non-significant association between smoking and infant birth weight found in this study warrants some discussion. The majority of studies that have examined the relationship between smoking and pregnancy outcome have employed samples with a wide range of maternal age. This study was confined to women between 15 and 20 years of age. A tentative explanation for the absence of a significant association between smoking and pregnancy outcomes may lie in a cumulative effect for smoking. Further research into the notion of a threshold duration for smoking is suggested.

Although smoking was not significantly associated with birth weight or length of gestation, the substantive importance of a smoking risk should not be overlooked. An examination of the mean differences in birth weight for smokers versus non-smokers was carried out. Smokers experienced a mean birth weight of 82.3 grams less than non-smokers. Although lacking statistical significance, such a finding may have some clinical relevance. In cases where birth weight is expected to be low, even modest gains through the encouragement of non-smoking may prove beneficial.

As noted earlier, stressful life events have been consistently identified in the literature as an important variable in both emotional and physical health outcomes. The research findings so far accumulated have been logically compelling but statistically modest. Although interpretations must be made with caution, this study was able to provide suggestive evidence of a possible relationship between stressful life events and infant birth weight.

A primary contribution of this research has been the identification of important relationships for prenatal care, alcohol consumption, weight gain and possibly stress with length of gestation and infant birth weight.

Evidence has been presented in this study for the importance of prenatal care. Suggestions for future research focusing upon the components of prenatal care most closely associated with pregnancy outcomes have been made. This study has also provided evidence for the negative and potentially serious implications of youthful drinking for length of gestation and infant birth weight. The health effects of youthful drinking are clearly an area warranting further research attention. As noted, prenatal care, alcohol consumption and weight gain are, to some extent, malleable factors likely sensitive to a variety of program interventions. However, factors such as parental and life event stress are not so obviously amenable to program interventions. Aspects of social support and life event stress are concerns that stretch across the life time of the individual. Any programming efforts aimed at enhancing perceptions of support or coping with stressful events should consider both a youthful target group and creative strategies of early intervention. Women who experience life events they describe as stressful and who appear to lack appropriate supports should perhaps be considered as a group at risk for potential pregnancy difficulties. Referrals to other agencies or the provision of additional services (ie., family counselling, public health visits) should be made,

where possible. Future research efforts might focus on the ways in which such interventions could be implemented within a family practice setting.

CHAPTER 9.0

IMPLICATIONS

9.1 Introduction

This chapter considers some of the implications arising from the results of the present study. However, before turning our attention to such implications, a number of issues must be considered. In particular, concerns about the generalizability of the study results to other populations must be addressed. The study design and some factors that may affect the over all generalizability of the study findings must also be discussed. Finally, the limitations of the measurements used and the quality of the data gathered is examined.

9.2 Generalizability

The aspects of generalizability to be discussed here concern first, the representativeness of the study group with respect to the population from which they were drawn and secondly, the use of mean substitution for missing data.

As noted in Chapter 6.0, information about the teenagers who refused to participate in this study was not made available, for reasons of confidentiality.

The evidence presented in Appendix B provided some confidence that the study group was representative of the population of childbearing teenagers in Middlesex County, at least with respect to the central variables of length of gestation, infant birth weight, maternal age and marital status. Although no evidence of participant bias could be found, such a possibility can not be completely ruled out. Therefore, generalizations of study findings to all childbearing teenagers in Middlesex County can be made only with caution.

Secondly, the treatment of missing data holds important implications for the generalizability of study results. For this study, the independent variables of father support and weight gain suffered from missing data. For father support 31 cases (15.2%) were missing information and 10 cases (4.9%) were missing information on weight gain. It is believed that the information missing for father support is systematic rather than random. That is, respondents were missing information on father support because there had <u>never</u> been a father or suitable father replacement (ie. step-father) in the home. Therefore, it is reasonable to speculate that these 31 cases may share other social characteristics possibly associated with the study outcomes of length of gestation and infant birth weight.

To impute the group mean to those cases because of missing information on one variable may have distorted the results. In order to determine if mean substitution has resulted in very different findings, selected analyses were repeated allowing for a listwise deletion of cases with missing values for support and weight gain. The results of these analyses are presented in Table F.24. For both dependent variables, length of gestation and birth weight, deletion of missing values did not alter the associations observed. Father support was significantly related to length of gestation and not associated with birth weight when mean replacement was used and remained so when listwise deletion of missing cases was allowed. Weight gain also remained significantly associated with both outcomes. Based on these analyses, we may conclude that the results reported in Chapter 7.0 are not substantially different than would have been expected had mean substitution for missing values not been used.

9.3 Study Design

A second issue to be considered involves an examination of selected aspects of the study's design that may affect the quality of the study. A major strength of the study's design is the prospective nature. Since a goal

of science is the unravelling of causal associations, the prospective design is an important feature. In addition to the strengths, certain weaknesses must be acknowledged. First, the majority of subjects were drawn from the caseload of physicians. It was not possible to monitor the physicians or their patients. Thus, it is possible that some physicians referred only healthy patients and/or patients who appeared early for prenatal care. A comparison of pregnancy outcomes between the study group and the population of teenage mothers in Middlesex County revealed no significant differences in length of gestation or infant birth weight, both variables likely to be sensitive to the exclusion of less healthy subjects. However, the possibility that some physicians may have selectively referred patients can not be entirely ruled out.

The age range of the study group does not include teenage women aged 14 years or less. Therefore, the extent to which the findings from this study group apply to very young teenagers can not be determined. However, very young teenagers account for less than one percent of all live births.

Approximately 62 percent of the study group were found to be in the lower social classes. This should not be interpreted as meaning that only middle and lower class teenagers become pregnant. Since there was no information available from the physicians about women who declined to participate, it was not possible to determine if the upper class teenagers disproportionately refused to participate. It may be that, when faced with a pregnancy, upper class teenagers have more options from which to choose. Such options may range from moving out of the area until after the delivery of the baby to terminating the pregnancy.

9.4 Measurement and Quality of Data

Whenever possible, multi-item indices with published reliability and validity estimates were chosen to measure the study variables. As can be seen from Chapter 6.0, much attention was devoted to the assessment of the selected measures. The satisfactory evaluation of their psychometric properties determined their inclusion in this study. It was not possible, in all cases, to obtain reliable and valid measures for all of the variables of interest (ie., partner support). In the absence of available measures, scales were designed by the author for use in this study. Although limited assessment of the

psychometric properties of these scales was undertaken through pretesting and with the study data, the possibility that these measures lack appropriate reliability and validity must be considered.

Some additional discussion is required about the self-report measures of smoking and drinking behaviour used in this study. Information about the smoking and drinking behaviours was obtained from the majority of respondents through face-to-face interviews using questions adapted from the Canada Health Survey. Although 7.4 percent of the questionnaires were self-administered, this is not likely to seriously bias the study results. While the debate continues, some investigators have suggested that data collected through interviewer-administered questionnaires is perhaps more reliable than information collected through self-administered questionnaires. This belief arises in part from the control that can be exercised over the completeness of the responses, and over the participation of other family members who might influence the responses.

However, for reasons of social desirability, some respondents might identify themselves as non-smokers, thereby misrepresenting their true smoking status. Such a bias in responses would dilute a real difference between

the non-smoking and smoking groups. However, it should be noted that a main effect for alcohol consumption was found in this study. Taking this one step further, it appears reasonable to believe that if teenage women were to under-report any behaviour, they would be more likely to under-report an illegal activity such as alcohol consumption, rather than smoking. However, for this study it was not possible to completely rule out the misclassification of smoking behaviour as one possible explanation for the non-significant association between smoking and infant birth weight.

9.5 Suggestions for Future Research

The prospective design of this study and the careful attention to issues of measurement, warrant some confidence in the validity of the study's main findings. It is not possible for any one study to be definitive. The present study has identified a few variables that appear to be associated with length of gestation and infant birth weight. Other prospective longitudinal studies are required to confirm and extend the relationships suggested by this research.

One area of concentration for such research could involve the evaluation of different programs of prenatal care. Such studies would attempt to identify those program elements that appear to be causally related to favourable pregnancy outcomes, and with infant birth weight in particular. One possible approach for future research might involve intervention studies with family practice physicians. Such studies might examine the effects on birth weight of manipulating the educational or supportive counselling components of prenatal care to determine the impact on pregnancy outcomes among young women. It may be that information provided to pregnant teenagers within an atmosphere of concern and understanding may lead to a greater sense of confidence and a reduction in distress and anxiety. It is also possible that a reduction in distress and an increase in feelings of confidence and self-worth might lead to improved pregnancy outcomes including an increase in birth weight. Although this study was able to identify an important role for prenatal care, it was not possible to identify specific components of importance to pregnancy outcome. Future research in the form of intervention trials will be a major step toward providing this information.

Another area for future research would involve a further exploration of the relationship between alcohol consumption and both length of gestation and birth weight among young women. Although this study was able to identify alcohol use as an important factor in pregnancy outcomes, it must be left to future research to look more carefully at such exposure characteristics as beverage type, amount consumed and the stage of pregnancy where risk may be greatest. A goal of the present research has been to identify some new variables possibly associated with variations in length of gestation and birth weight. It is hoped that future research will further explicate the relationships revealed through the present study.

APPENDIX A

SAMPLE SIZE

APPENDIX A

SAMPLE SIZE

Introduction

Sample size in this study was fixed through its dependence upon subjects gathered by the larger study. Estimates of statistical power were calculated based upon statistical considerations introduced through the major analytic technique of multiple regression used in this research.

Estimates of Statistical Power

Following the approach, suggested by Cohen (1977), uses three factors; sample size (N), number of independent variables (U) and explained variance (R^2) to determine the statistical power available in regression analysis.

From the information provided by Cohen (1977:416) the following table of power values has been assembled. Table A.1 provides power values under conditions of decreased sample size and with increased numbers of predictor variables across increments of explained variance. At a most conservative level, this table provides power values for a range of explained variance from a low of 10 percent

to a high of 30 percent. The significance criterion was set at the .05 level. As can be seen from Table A.1, with a sample size of 200 cases and 5 independent variables, the likelihood that a statistical test would detect a significant difference is .88 at the lower level of explained variance (.10). With 200 cases and an increase to 10 independent variables at 10 percent explained variance, the power of most statistical analyses remained satisfactory (.80 or above).

TABLE A.1

POWER VALUES AS A FUNCTION OF SAMPLE SIZE AND THE NUMBER OF PREDICTOR VARIABLES

		R^2		
		.10	.20	.30
N	U			
200	5	.88	*	*
	10	.84	.98	*
150	5	.80	*	*
	10	.76	.98	*

* indicates a power > .995
N = sample size
U = number of independent variables

Missing data that result in some cases being lost to a particular analysis is one of the more common challenges to statistical power. Again, from Table A.1 the power of our statistical test drops as sample size is reduced. For

example, at 10 percent explained variance, with 200 cases and 5 independent variables, the power of a statistical test is more than adequate at .88. However, should case size be reduced, perhaps through missing data, from 200 to 150 cases and the number of independent variables increased to 10, the power of our analysis, falls to .76 at the level of 10 percent explained variance.

Given the power values presented in Table A.1 it becomes clear that losing cases through missing data is most problematic for a combination of small values of explained variance (R^2) and a large number of predictor variables. In fact, any combination of 150 cases or less with 10 or more independent variables that explain less than 10 percent of the variance reduces the chance of finding a statistically significant effect. However, combining a larger case size with the most parsimonious set of predictor variables greatly increases the power of the analysis even under conditions of low explained variance.

Based upon these estimates and the estimates of explained variance from the studies reviewed earlier (.10 to .30), a minimum sample size of 200 subjects will more than adequately provide the necessary power to detect substantively relevant effects, should such effects exist.

Probability Associated With A Selected Number of Significant Findings

This study has considered 17 independent variables and 2 dependent variables. In certain multiple regression analyses all independent variables were evaluated simultaneously with respect to each dependent variable. In all, 17 tests of statistical significance were performed in each analysis. Therefore, it may be possible that the number of significant findings could be explained on the basis of chance alone. In order to determine the probability of finding a selected number of variables to be significant after performing 17 statistical tests, the following formula was used (Colton, 1974:74).

$$f(x) = ({}^{n}C_{x}) * a^{x}(1-a)^{n-x}$$

x = number of significant variables
n = number of statistical tests
a = alpha level .05

This formula yields the probability (P) of finding a selected number of significant associations given a set number of statistical tests (n) for a specified level of significance (a).

TABLE A.2

PROBABILITY (P) OF (x) SIGNIFICANT FINDINGS WITH AN ALPHA LEVEL OF .05 FOR (n) STATISTICAL TESTS

SIGNIFICANT VARIABLES (x)	NUMBER OF TESTS (n)	PROBABILITY OF OCCURRENCE (P)
6	17	.00001
5	17	.0001
4	17	.008
3	17	.042
2	17	.158
1	17	.374

As can be seen from Table A.3, the probability of finding four significant variables after performing 17 statistical tests at an alpha level of .05 was 8 chances in one thousand or slightly less than one chance in one hundred. Given this level of probability, the finding of four or more significant variables was unlikely due to chance alone.

APPENDIX B

ASSESSMENT OF BIAS

APPENDIX B

ASSESSMENT OF BIAS

Given the confidential nature of the physician-patient relationship, comparative data could not be obtained from those refusing to participate. However, percent distribution for marital status, maternal age, paternal age, infant sex, length of gestation and infant birth weight for women less than 20 years old, resident in Middlesex County during the study years (1983-1985) were obtained from the Ontario Ministry of Health. Within limitations, this information allows for a determination of bias with respect to some central study variables.

The percent distribution of cases across categories of the variables listed above and corresponding tests of significance are presented in Table B.1. From the information assembled, it appears that the sample differs from the population only for paternal age. The sample contains proportionately more fathers less than 20 years old. The difference was likely due to bias introduced through missing data from the Ministry of Health. Approximately 37 percent of the cases from the Ministry reported paternal age as unknown. For all other variables

examined, no significant differences between the study group and the population of parturient adolescent women were found.

TABLE B.1

DISTRIBUTION AND TESTS OF SIGNIFICANCE FOR SELECTED VARIABLES FOR STUDY GROUP AND POPULATION, MIDDLESEX COUNTY, 1985

VARIABLE	SAMPLE (N)	POPULATION (N)	TEST STATISTIC	P-VALUE
MATERNAL AGE				
< 15	0	1		
15 - 19	204	239	X^2=0.085	p>.05
MARTIAL STATUS				
Never Married	139	160		
Ever Married	65	80	X^2=0.108	p>.05
INFANT SEX				
Male	111	131		
Female	93	109	X^2=0.01	p>.05
GESTATION (wks)				
20 - 39	71	95		
40+	133	145	X^2=1.08	p>.05
PATERNAL AGE				
15 - 19	80	28		
20+	124	212	X^2=45.6	p<.05
BIRTH WEIGHT (gm)				
	Mean	**SD**		
Sample	3311.66	538.68		
Population	3318.74	573.64	t=-0.133	p>.05

APPENDIX C

CONSENT FORM

THE UNIVERSITY OF WESTERN ONTARIO
HEALTH CARE RESEARCH UNIT

Consent for Access to Medical Records

I, _____ fully understand that the information contained in these records will be held in the strictest confidence by the project staff and that this information will never be shared or reported in a manner that will identify me or my infant(s).

Specifically:

I hereby consent to allow Doctor _____ and/or the Medical Records Department at _____ to release the medical records for myself and my infant(s) to the project staff of the Health Care Research Unit for the purpose of reviewing and abstracting information from these records.

Witness: _____ Signed: _____

Date: _____

Parent or Guardian: _____

APPENDIX D

QUESTIONNAIRE

NOTE: This questionnaire was used for the collection of data at the first interview. Questions on smoking and drinking were taken from the second interview. Those questions have been included and may be found on page 1A. The format of this questionnaire was used for both interview and self-administered purposes.

50. Have you ever smoked cigarettes on a regular basis?

0. no GO TO QUESTION 54
1. yes

51. At what age did you begin smoking?

I was _____ years old.

52. On an average day, about how many cigarettes do you smoke?

I smoke _____ cigarettes daily.

53. Since you became pregnant, would you say you smoked:

1. less than usual? New amount
2. about the same as usual?
3. more than usual? New amount
4. quit while pregnant?

54. Have you ever drank alcohol on a regular basis?

0. no GO TO QUESTION 58
1. yes

55. At what age did you begin drinking?

I was _____ years old.

56. In an average week, how much of the following do you drink?

1. hard liquor _____ ounces.
2. wine _____ ounces.
3. beer _____ ounces.

57. Since you became pregnant, would you say that you have been drinking alcohol:

1. less than usual? New amount
2. about the same as usual?
3. more than usual? New amount
4. quit while pregnant?

SUBJECT I.D. NUMBER _____

SOCIAL SUPPORT AND OUTCOMES IN TEENAGE PREGNANCY

TIME ONE

Respondent's Name: _____

Address: _____

_____

Phone: _____

Date of Interview _____

Date of Confinement _____

Consent Signed: Yes ____

No ____

SECTION 1: SOME FACTS ABOUT YOURSELF

This section asks you a few questions about yourself.

1. When were you born?

_____
day / month /year

2. For most of your life have you lived

1. in a rural area (less than 2500 people)
2. in an urban area (greater than 2500 people)

3. a) Please circle the number of the last grade that you successfully completed.

1 2 3 4 5 6 7 8 9 10 11 12 13

b) Did you go to a community college or university?

1. no community college or university
2. community college 1 2 3
3. university 1 2 3

4. Are you currently,

1. working full time only
2. working full time, student part time
3. working part time only
4. working part time, student part time
5. not working
6. a student (including home tutoring)
7. other _____

5. If you are not currently employed please go to question 6. If you are now working, what type of work do you do?

_____

_____

6. What is your religion? (Please circle)

1. Protestant
2. Catholic
3. Jewish
4. no particular faith
5. other (specify)_____

7. What is your current marital status? (Please circle)

1. single/never married
2. separated, widowed, divorced
3. living together but not married
4. married

8. Please read over the list below and circle all the people who lived with you <u>while you were growing up</u>.

1. mother
2. father
3. stepmother
4. stepfather
6. aunt
7. uncle
8. brother(s)
9. sister(s)
10. grandmother
11. grandfather
12. adult male (not related)
13. adult female (not related)
14. other male relative
15. other female relative
16. roommate(s)
17. anyone not listed? (Who)

_____

9. a) Not counting yourself, how many people currently live with you?

_____other people live with me.

9. b) Please circle all the people currently living with you. If you live alone please skip to question 10.

1. mother	9. sister(s)
2. father	10. grandmother
3. stepmother	11. grandfather
4. stepfather	12. adult male (not related)
5. husband/boyfriend	13. adult female (not related)
6. aunt	14. other male relative
7. uncle	15. other female relative
8. brother(s)	16. roommate(s)

17. anyone not listed? (who)_____

10. In general, what were your marks like during your last two years in school? (Please circle)

1. D's to F's
2. C to D's
3. C's
4. B to C's
5. B's
6. A to B's
7. A's

11. Please read each statement carefully then circle the number that tells how strongly you agree or disagree.

1. strongly disagree
2. somewhat disagree
3. somewhat agree
4. strongly agree

Because of my pregnancy:	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
a) My relationship with the father of my baby has changed for the better.	1	2	3	4
b) My relationship with my family has changed for the better.	1	2	3	4
c) My relationship with my friends has changed for the better.	1	2	3	4

4.

12. Please read each statement below then circle the number that tells how often you feel this way.

1. never
2. once in awhile
3. fairly often
4. very often

Because of my pregnancy I feel that:	Never	Once in Awhile	Fairly Often	Very Often
a) People will not let me do things for myself.	1	2	3	4
b) People will not let me make my own declaions.	1	2	3	4
c) People treat me like a child.	1	2	3	4

13. Please read each statement below then circle the number that tells how strongly you agree or disagree.

1. strongly disagree
2. somewhat disagree
3. somewhat agree
4. strongly agree

	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree
a) Since I've become pregnant I feel unattractive.	1	2	3	4
b) Lately, I think I have never looked better.	1	2	3	4
c) I don't like the changes my body is going through.	1	2	3	4

14. Below is a list of things people sometimes do when dealing with their problems. Please tell us if you use any of these methods when dealing with problems that you face because of your pregnancy.

1. never
2. once in awhile
3. fairly often
4. very often

how often do you:	Never	Once in Awhile	Fairly Often	Very Often
a) try to ignore problems by thinking of good things	1	2	3	4
b) look around at other people and remind yourself how much better off you are	1	2	3	4
c) think over way you have dealt with similar problems in the past	1	2	3	4
d) talk over your problems with a close friend	1	2	3	4
e) ask the advice of someone you trust	1	2	3	4
f) ask your doctor for information	1	2	3	4
g) read books or magazine articles about people with similar problems	1	2	3	4
h) decide not to worry about some things because there is really nothing you can do to change it	1	2	3	4
i) tell yourself that some things are just not meant to be	1	2	3	4
j) tell yourself it doesn't matter what others may think or say	1	2	3	4
k) get angry and yell at other people	1	2	3	4
l) try to do things yourself instead of waiting for others	1	2	3	4
m) stay away from people who are not happy with you	1	2	3	4

15. Think now about all the pleasures and the problems that are a part of your pregnancy. Please read each statement below and circle the number that tells how you feel.

When you think of these things:	Very	Some-what	Only a Little	Not At all
a) How bothered or upset do you feel?	1	2	3	4
b) How contented do you feel?	1	2	3	4
c) How tense do you feel?	1	2	3	4
d) How worried do you feel?	1	2	3	4
e) How unhappy do you feel?	1	2	3	4
f) How relaxed do you feel?	1	2	3	4
g) How fearful do you feel?	1	2	3	4

16. Please read each item carefully. If you decide it is something you could not do by yourself place a check ( ) mark in the first column. If this is something you could do by yourself, place a check in the second column and, if you have done it place a check in the last column. Please note that you would check both the second and third column if the item is something you could do and have done by yourself.

	Could not Do This	Could Do it	Have Done it
a) A friend comes for dinner. You need to prepare a meal.			
b) You are expecting visitors for the weekend. You need to do some housekeeping tasks.			
c) You have some buttons missing off your shirt. You need to find some buttons and sew them on.			
d) You have decided to have a party but you do not have much money. You need to plan carefully and get the most for your money.			
e) You always seem to be running out of money. You need to plan and stick to a budget.			

16. (continued)

	Could not Do This	Could Do it	Have Done it
f) It is now the beginning of the month. You must find and move into a new place by the end of the month.	____	____	____
g) You have been asked to babysit a young child for the weekend. You must prepare meals and care for this child.	____	____	____
h) You have started a new job (new school term). You need to shop for clothes that are not too expensive.	____	____	____
i) Your teacher (boss) puts you in charge of other people for a short time. You need to organize your group and provide some direction in completing a task.	____	____	____
j) You apply for a job. There are many forms to fill in. You read each item carefully and do your best to correctly answer all questions.	____	____	____
k) You are going for an interview. You need to clearly describe to people the things you are good at without sounding boastful.	____	____	____
l) You have a problem with your school work (job). You need to ask your teacher (boss) for help and advice in solving it.	____	____	____
m) You like your friends but one of them has said something about you that you don't like. You decide to talk to this friend and try to deal with the issue as best you can.	____	____	____
n) Your family has not spent much time together lately. You think you can change this and have your family spend more time together.	____	____	____

SECTION 2.: FOR WOMEN NOT LIVING WITH A HUSBAND OR BOYFRIEND

Now I would like to ask you a few questions about the father of your baby. Please remember that your answers are completely private. We do not want to know who he is and at no time will your name be put together with your answers.

17. How old is the father of your baby?

_____ years old.

18. At the present time is he:

1. working full time only
2. working full time and a student part time
3. working part time only
4. working part time and a student part time
5. not working
6. a student (including home tutoring)
7. other _____

19. Please tell us what kind of work he does. If he is not currently working, what type of work did he do at his last job?

_____

_____

20. a) Please circle the last grade that he successfully completed.

1 2 3 4 5 6 7 8 9 10 11 12 13

b) Did he go to community college or university?

1. no university or community college
2. yes, community college 1 2 3 4
3. yes, university 1 2 3 4 5 6

21. How often do you spend time with the father of your baby? Would you say you:

1. Have no contact with him at all
2. see him maybe once a month
3. see him 2 - 3 times a month
4. see him at least once a week
5. see him more than once a week
6. see him every day

22. When you think about <u>how often you see him</u>, do you feel you want to:

1. see less of him than you do now?
2. leave things the way they are?
3. see more of him than you do now?

23. When you think about <u>your relationship with the father</u> of your baby, how strongly do you agree or disagree with the following statements.

<u>He is someone:</u>	<u>Strongly Disagree</u>	<u>Somewhat Disagree</u>	<u>Somewhat Agree</u>	<u>Strongly Agree</u>
a) I can talk with about things that are important to me.	1	2	3	4
b) who is affectionate toward me.	1	2	3	4
c) who wants to be involved in caring for the baby.	1	2	3	4
d) who understands how I am feeling.	1	2	3	4
e) I can count on for financial support should I need it.	1	2	3	4

24. a) Does he know that you are pregnant?

1. yes
2. no

b) If <u>no</u>, do you plan to tell him?

1. yes
2. no

25. Does he want you to have the baby?

1. yes
2. no
3. I'm not sure how he feels.

26. Was this pregnancy something:

1. you both planned?
2. he planned?
3. you planned?
4. that happened and was not planned?

27. People often think over plans for the baby and for themselves. Have you thought that you might:

1. look after him/her yourself?
2. have your parents look after him/her?
3. place him/her for adoption?
4. other (please describe) _____

_____

28. What sex do you hope your baby will be?

1. male
2. female

If you are living with your parents, please answer the following questions by thinking of you and your family.
If you are not living with your parents, please answer the following questions by thinking of yourself.

29. Please circle the number that best tells how often you (your family)

	Never Happens	Happens Once in Awhile	Happens Fairly Often	Happens Very Often
do not have enough money:				
a) to buy the kind of food you need?	1	2	3	4
b) to pay the rent (mortgage) without help?	1	2	3	4
c) to buy the clothing you need?	1	2	3	4
d) for transportation costs (bus, gas for car?)	1	2	3	4
e) to spend on things that you (your family) want?	1	2	3	4
f) to pay all the bills that come in?	1	2	3	4

30. By the end of the month would you say: (Please circle)

1. there is always some money left over.
2. there is usually some money left over.
3. there is just enough to get by on.
4. you sometimes have to borrow money until next pay.
5. you always have to borrow money until next pay.

31. Please rank the following sources of income in order of their dollar value for you (your family). For example, if wages provides the most money it would be ranked as 1 and so on. If any of these are not sources of income for you please leave them blank.

____ wages
____ government cheques (ie. unemployment, welfare)
____ parents provide some money or buy major items (crib, clothes, baby supplies)
____ father of the baby provides some money
____ other sources (please describe) _____
____ I live at home and I'm not sure where the money comes from.

SECTION 3: FAMILY HISTORY

Now we would like to ask you some questions about your parent(s) (or adoptive parents) and about your relationship with them. (Please circle)

32. Are both your natural parents alive now? (If you are adopted, please answer the following questions by thinking about your adoptive parents.)

1. yes
2. no

33. During your life have your parents?

1. divorced?
2. separated?
3. remained married?

34. If one or both of your parents died, please fill in the sentence that tells us which parent died and how old you were when this happened.

1. My mother died when I was _____ years old.
2. My father died when I was _____ years old.

35. If there is a father or someone you think of as a father in your family, please answer questions 35 and 36 by thinking of that person. Otherwise, please go to question 37.

a) What was the last grade he completed?

1 2 3 4 5 6 7 8 9 10 11 12 13

b) Did he go to community college or university?

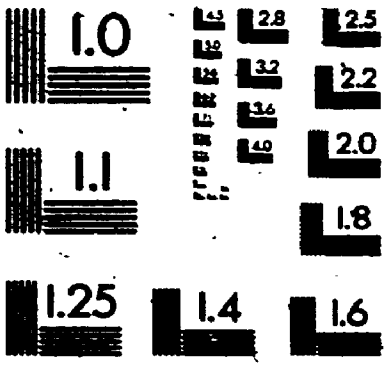
1. no community college or university
2. yes, community college 1 2 3 4
3. yes, university 1 2 3 4 5 6

36. What is/was his usual job called? (Please describe what he does/did at that job)

_____

_____

3 of/de 3



13.

If there is a mother or someone you think of as a mother in your family, please answer questions 37 and 38 by thinking of that person. Otherwise, please go to question 40.

37. a) Thinking now about your mother/stepmother, what was the last grade she completed? (Please circle)

1 2 3 4 5 6 7 8 9 10 11 12 13

b) Did she go to community college or university?

1. no community college or university
2. yes, community college 1 2 3 4
3. yes, university 1 2 3 4 5 6

38. What is/was her usual job called? (Please describe what she does/did at that job.)

_____

_____

14.

IF YOU DO NOT HAVE A MOTHER OR SOMEONE YOU THINK OF AS MOTHER PLEASE GO TO THE NEXT PAGE. OTHERWISE PLEASE ANSWER THE QUESTION ON THIS PAGE.

39. The following questions ask something about your relationship with your parent(s) as you were growing up. As you read each sentence, please think back over your relationship with your MOTHER. Please circle the number that best tells how much each statement is like your past experience.

1. very much like my experience
2. somewhat like my experience
3. not very much like my experience
4. not at all like my experience

My mother:	very much like	somewhat like	not very much like	not at all like
a) spoke to me with a warm and friendly voice	1	2	3	4
b) did not help me as much as I needed	1	2	3	4
c) let me do those things I liked doing	1	2	3	4
d) seemed emotionally cold to me	1	2	3	4
e) appeared to understand my problems and worries	1	2	3	4
f) was affectionate to me	1	2	3	4
g) liked me to make my own decisions	1	2	3	4
h) did not want me to grow up	1	2	3	4
i) tried to control everything I did	1	2	3	4
j) invaded my privacy	1	2	3	4
k) enjoyed talking things over with me	1	2	3	4
l) frequently smiled at me	1	2	3	4
m) tended to baby me	1	2	3	4
n) did not seem to understand what I needed or wanted	1	2	3	4
o) let me decide things for myself	1	2	3	4
p) made me feel I wasn't wanted	1	2	3	4
q) could make me feel better when I was upset	1	2	3	4
r) did not talk with me very much	1	2	3	4
s) tried to make me depend on her	1	2	3	4
t) felt I could not look after myself unless she was around	1	2	3	4
u) gave me as much freedom as I wanted	1	2	3	4
v) let me go out as often as I wanted	1	2	3	4
w) was overprotective of me	1	2	3	4
x) did not praise me	1	2	3	4
y) let me dress in any way I pleased	1	2	3	4

IF YOU DO NOT HAVE A FATHER OR SOMEONE YOU THINK OF AS FATHER PLEASE GO TO THE NEXT PAGE. OTHERWISE PLEASE ANSWER THE QUESTION ON THIS PAGE.

40. The following questions ask something about your relationship with your parent(s) as you were growing up. As you read each sentence, please think back over your relationship with your FATHER. Please circle the number that best tells how much each statement is like your past experience.

1. very much like my experience
2. somewhat like my experience
3. not very much like my experience
4. not at all like my experience

My Father:

	very much like	somewhat like	not very much like	not at all like
a) spoke to me with a warm and friendly voice	1	2	3	4
b) did not help me as much as I needed	1	2	3	4
c) let me do those things I liked doing	1	2	3	4
d) seemed emotionally cold to me	1	2	3	4
e) appeared to understand my problems and worries	1	2	3	4
f) was affectionate to me	1	2	3	4
g) liked me to make my own decisions	1	2	3	4
h) did not want me to grow up	1	2	3	4
i) tried to control everything I did	1	2	3	4
j) invaded my privacy	1	2	3	4
k) enjoyed talking things over with me	1	2	3	4
l) frequently smiled at me	1	2	3	4
m) tended to baby me	1	2	3	4
n) did not seem to understand what I needed or wanted	1	2	3	4
o) let me decide things for myself	1	2	3	4
p) made me feel I wasn't wanted	1	2	3	4
q) could make me feel better when I was upset	1	2	3	4
r) did not talk with me very much	1	2	3	4
s) tried to make me depend on him	1	2	3	4
t) felt I could not look after myself unless he was around	1	2	3	4
u) gave me as much freedom as I wanted	1	2	3	4
v) let me go out as often as I wanted	1	2	3	4
w) was overprotective of me	1	2	3	4
x) did not praise me	1	2	3	4
y) let me dress in any way I pleased	1	2	3	4

SECTION 4. RELATIONSHIPS WITH OTHERS

41. We are interested in knowing if there is a special person in your life. Someone you can <u>really trust</u>. That is, someone you can really talk to about your problems and your feelings. (Please circle)

a) Is there <u>one person</u> you can really talk to?

1. yes
2. no - GO TO QUESTION 42

b) Is this person

1. male?
2. female?

c) Is this person

1. a helping professional (teacher, public health nurse, etc.)?
2. a neighbour?
3. a friend?
4. an other relative?
5. a brother/sister?
6. a mother/father?
7. a husband/boyfriend?
8. other (who?)_____

42. Not including the people you now live with, please place an "x" in the box that tells <u>how often</u> in a normal month you would <u>talk</u> to:

	Daily	More than once a week	Once a week	2-3 times a month	Once a month or less	Never
a) other relatives, (aunts, cousins, grandparents)						
b) close friends						
c) other friends (<u>not</u> counting close friends)						
d) neighbours						

17.

43. Not counting the people you live with, how many close friends do you have. (by close friends, we mean people you can talk to on the phone or call on when you feel like going out.)

I have _____ close friends.

44. We would like to know what kinds of things you do for fun. Below is a list of activities people usually like to do for relaxation and enjoyment. Please tell me how often you do the following and whether you usually do these things alone or with friends.

	HOW OFTEN						WITH WHOM USUALLY	
	daily	more than once a week	once a week	2-3 times a month	once a month or less	never	alone	with others
a) attend sporting events								
b) participate in team sports(school, PUC)								
c) play games (video games, cards, bingo)								
d) hobbies (painting, photography,collections)								
e) go to movies,concert, theatre								
f) go to meetings (clubs, guides, J.A., etc.)								
g) go to church or church run activities								
h) go to classes,lectures, take lessons								
i) go to dances, house parties								
j) visit friends,relatives								
k) play a musical instrument								
l) read (at library, at home, in a group)								
m) go on picnics, drives								
n) take walks, (parks, neighbourhood)								
o) volunteer work,(visit elderly,candystriping)								
p) go shopping								
q) jogging,exercise, fitness, etc.								
r) other things not listed _____								

45. How often do you attend religious services?

1. never or almost never
2. a few times a year, as on important religious holidays or special occasions
3. about once a month
4. about 2 or 3 times a month
5. about once a week or more

46. How religious are you? Would you say you are:

1. not at all religious
2. somewhat religious
3. very religious

47. Now I would like to know something about your relationships with other people. Please read each sentence and circle the number which best tells how closely the statement describes your relationships.

Are they

1. very much like this
2. much like this
3. somewhat like this
4. not very much like my experience
5. not at all like this

	very much like	much like	somewhat like	not very much like	not at all like
a) When I'm with my friends I feel completely able to relax and be myself.	1	2	3	4	5
b) I share the same ideas about life that many of my friends do.	1	2	3	4	5
c) My friends don't know one another well.	1	2	3	4	5
d) People who know me trust me and respect me.	1	2	3	4	5

47. (continued)

1. very much like this
2. much like this
3. somewhat like this
4. not very much like this
5. not at all like this

	very much like	much like	somewhat like	not very much like	not at all like
e) No matter what happens, I know that my family will always be there for me should I need them	1	2	3	4	5
f) When I want to go out to do things I know that many of my friends would enjoy doing these things with me.	1	2	3	4	5
g) I have at least one friend that I could tell anything to.	1	2	3	4	5
h) Sometimes I'm not sure if I can completely rely on my family.	1	2	3	4	5
i) My friends do not always approve of my attitudes and lifestyle.	1	2	3	4	5
j) My family lets me know they think I'm a worthwhile person.	1	2	3	4	5
k) I feel very close to some of my friends.	1	2	3	4	5
l) People in my family have confidence in me.	1	2	3	4	5
m) There are some problems that I can't share with anyone.	1	2	3	4	5
n) People in my family provide me with help in finding solutions to my problems.	1	2	3	4	5
o) People who know me think I am good at what I do.	1	2	3	4	5
p) My friends would take the time to talk over my problems, should I ever want to.	1	2	3	4	5
q) I know my family will always stand by me.	1	2	3	4	5
r) Even when I am with my friends I feel alone.	1	2	3	4	5

SECTION 5. LIFE EVENTS

48. Please read each statement and Circle 0 if within the last 12 months, it did not happen to you or 1 if it did happen to you. If the event did happen to you, please circle the number that tells how stressful this event was for you. Also, please name the month when this event happened to you.

1. not at all stressful
2. somewhat stressful
3. very stressful

In the past 12 months:	Happened No	Happened Yes	Month	None	Some	Very
a) I have started high school/ university	0	1	____	1	2	3
b) I have started to date	0	1	____	1	2	3
c) My parents have separated/ divorced	0	1	____	1	2	3
d) I have had more arguments with my parents	0	1	____	1	2	3
e) My brother/sister left home	0	1	____	1	2	3
f) I started using illegal drugs or alcohol	0	1	____	1	2	3
g) A close friend of mine died	0	1	____	1	2	3
h) My parents have started to argue more	0	1	____	1	2	3
i) I had to quit school	0	1		1	2	3
j) I have had more arguments with my husband/boyfriend.	0	1	____	1	2	3
k) I was suspended from school	0	1	____	1	2	3
l) My grandmother/grandfather died	0	1	____	1	2	3

48. (continued)

1. not at all stressful
2. somewhat stressful
3. very stressful

In the past 12 months:	Happened No	Happened Yes	Month #	None	Some	Very
m) I have moved away from my old neighbourhood	0	1		1	2	3
n) Someone close to me was sick enough to stay in hospital	0	1	____	1	2	3
o) I failed a grade or course in school	0	1	____	1	2	3
p) My husband/boyfriend lost his job	0	1	____	1	2	3
q) I was in trouble with the law	0	1	____	1	2	3
r) My brother/sister died	0	1	____	1	2	3
s) I was sick and had to stay in the hospital	0	1	____	1	2	3
t) Another adult came to live with my family	0	1		1	2	3
u) I broke up with my husband/ boyfriend	0	1	____	1	2	3
v) I discovered I was pregnant	0	1	____	1	2	3

SECTION 6. YOUR FEELINGS

49. These sentences tell how people sometimes feel. You may feel this way some of the time. Please read each statement carefully then circle the number that best tells how you have been feeling recently.

How much like you is each sentence. Is it:

1. very much like me
2. much like me
3. somewhat like me
4. not very much like me
5. not at all like me

		very much like	much like	somewhat like	not very much like	not at all like
a)	I feel strong and healthy.	1	2	3	4	5
b)	I am easily startled.	1	2	3	4	5
c)	I feel sad.	1	2	3	4	5
d)	I can change my plans or my mind if I get new information.	1	2	3	4	5
e)	When I get angry, I stay angry.	1	2	3	4	5
f)	I feel tense.	1	2	3	4	5
g)	I don't feel worth much.	1	2	3	4	5
h)	I yell at people.	1	2	3	4	5
i)	I like being the way I am.	1	2	3	4	5
j)	I feel nervous.	1	2	3	4	5
k)	I cry and I don't know why.	1	2	3	4	5
l)	I'm good at what I do.	1	2	3	4	5
m)	I feel like I am boiling inside.	1	2	3	4	5
n)	When faced with a problem I can work it out.	1	2	3	4	5
o)	My hands sometimes shake.	1	2	3	4	5
p)	I feel hopeless.	1	2	3	4	5

49. (continued)

1. very much like me
2. much like me
3. somewhat like me
4. not very much like me
5. not at all like me

	very much like	much like	somewhat like	not very much like	not at all like
q) I lose my temper.	1	2	3	4	5
r) When I fail at something I try again.	1	2	3	4	5
s) I feel tight inside.	1	2	3	4	5
t) I am a worthwhile person.	1	2	3	4	5
u) I feel angry.	1	2	3	4	5
v) New situations make me tense.	1	2	3	4	5
w) I feel ashamed of myself.	1	2	3	4	5
x) I get into fights or arguments.	1	2	3	4	5
y) I feel under pressure.	1	2	3	4	5
z) People would be better off without me.	1	2	3	4	5

50. Sometimes life seems to go our way and sometimes nothing we do seems to matter--things still happen to us anyway. Please read over each statement below and circle the number that best tells how much you agree or disagree.

1. strongly agree
2. mildly agree
3. neither agree nor disagree
4. mildly disagree
5. strongly disagree

	Agree				Disagree
a) I have little control over the things that happen to me.	1	2	3	4	5
b) There is really no way I can solve some of the problems I have.	1	2	3	4	5
c) There is little I can do to change many of the important things in my life.	1	2	3	4	5
d) I often feel helpless in dealing with problems of life.	1	2	3	4	5

50. (continued)

1. strongly agree
2. mildly agree
3. neither agree nor disagree
4. mildly disagree
5. strongly disagree

	Agree				Disagree
e) Sometimes I feel that I am being pushed around in life.	1	2	3	4	5
f) What happens to me in the future mostly depends on me.	1	2	3	4	5
g) I can do just about anything I really set my mind to.	1	2	3	4	5

51. Please read each statement below and circle the number that tells how strongly you agree or disagree.

1. strongly agree
2. mildly agree
3. neither agree or disagree
4. mildly disagree
5. strongly disagree

	Agree				Disagree
a) I feel that I have a number of good qualities.	1	2	3	4	5
b) I feel that I am a person of worth at least on an equal plane with others.	1	2	3	4	5
c) I am able to do things as well as most other people.	1	2	3	4	5
d) I take a positive attitude toward myself.	1	2	3	4	5
e) On the whole I am satisfied with myself.	1	2	3	4	5
f) All in all, I am inclined to feel that I am a failure.	1	2	3	4	5

52. Please think now about how you felt before you became pregnant. Please read each statement and circle the number that tells how strongly you would have agreed or disagreed at that time.

1. strongly agree
2. mildly agree
3. neither agree or disagree
4. mildly disagree
5. strongly disagree

	Agree				Disagree
a) I feel that I have a number of good qualities.	1	2	3	4	5
b) I feel that I am a person of worth at least on an equal plane with others.	1	2	3	4	5
c) I am able to do things as well as most other people.	1	2	3	4	5
d) I take a positive attitude toward myself.	1	2	3	4	5
e) On the whole I am satisfied with myself.	1	2	3	4	5
f) All in all, I am inclined to feel that I am a failure.	1	2	3	4	5

52. Please think now about how you felt before you became pregnant. Please read each statement and circle the number that tells how strongly you would have agreed or disagreed at that time.

1. strongly agree
2. mildly agree
3. neither agree or disagree
4. mildly disagree
5. strongly disagree

	Agree				Disagree
a) I feel that I have a number of good qualities.	1	2	3	4	5
b) I feel that I am a person of worth at least on an equal plane with others.	1	2	3	4	5
c) I am able to do things as well as most other people.	1	2	3	4	5
d) I take a positive attitude toward myself.	1	2	3	4	5
e) On the whole I am satisfied with myself.	1	2	3	4	5
f) All in all, I am inclined to feel that I am a failure.	1	2	3	4	5

53. The sentences below say something about how people sometimes feel. Please read each sentence and circle the number that best tells how often you have felt this way in the past 7 days.

Have you felt this way:

0. Rarely or none of the time (less than one day)
1. Some or a little of the time (1 to 2 days)
2. Occasionally or a moderate amount of time (3 to 4 days)
3. Most or all of the time (5 to 7 days)

During the past seven days:

a)	I was bothered by things that usually don't bother me.	0	1	2	3
b)	I did not feel like eating; my appetite was poor.	0	1	2	3
c)	I felt that I could not shake off the blues even with help from my family or friends.	0	1	2	3
d)	I felt that I was just as good as other people.	0	1	2	3
e)	I had trouble keeping my mind on what I was doing.	0	1	2	3
f)	I felt depressed.	0	1	2	3
g)	I felt that everything I did was an effort.	0	1	2	3
h)	I felt hopeful about the future.	0	1	2	3
i)	I thought my life had been a failure.	0	1	2	3
j)	I felt fearful.	0	1	2	3
k)	My sleep was restless.	0	1	2	3
l)	I was happy.	0	1	2	3
m)	I talked less than usual.	0	1	2	3
n)	I felt lonely.	0	1	2	3
o)	People were unfriendly.	0	1	2	3
p)	I enjoyed life.	0	1	2	3
q)	I had crying spells.	0	1	2	3
r)	I felt sad.	0	1	2	3
s)	I felt that people disliked me.	0	1	2	3
t)	I could not get "going".	0	1	2	3

54. Please read each statement below and circle the number that best describes how much you agree or disagree with each statement. There are no right or wrong answers, so answer according to your own opinion.

1. strongly agree
2. mildly agree
3. mildly disagree
4. strongly disagree

	Agree		Disagree	
a) One of the worst things about taking care of a home is that a woman feels she can't get out.	1	2	3	4
b) Having to be with children all the time gives a woman the feeling her wings have been clipped.	1	2	3	4
c) Most young mothers are bothered more by the feeling of being shut up in the home than by anything else.	1	2	3	4
d) One of the bad things about raising children is that you aren't free enough of the time to do just as you like.	1	2	3	4
e) A young mother feels "held down" because there are lots of things she wants to do while she is young.	1	2	3	4

SECTION 7. CLINICAL INFORMATION

This section asks some special questions about you. These questions may seem personal. We want to remind you that none of your answers will ever be put together with your name. Please try to answer each one. Your answers will help us very much.

55. How old were you when you first started your menstrual period?

_____ (age)

56. Approximately, when was the first day of your last period before your pregnancy?

_____ (day) _____ (month)

57. When did you expect your next period to begin before you found you were pregnant?

_____ (day) _____ (month)

58. How many weeks after you missed your period did you wait before seeing the doctor?

_____ (weeks)

59. How long do your periods usually last?

My periods usually last _____ days.

60. How many days are there usually between the 1st day of one period and the 1st day of the next period?

_____ days

61. Do you usually have a lot of pain with your period?

1. no, not very often
2. yes, sometimes
3. yes, very often

62. Do you usually have heavy bleeding with your period?

1. no, not very often
2. yes, sometimes
3. yes, very often

63. How old were you when you first began to date? (Please circle)

0. I have never dated

I was 8 9 10 11 12 13 14 15 16 17 18 19 years old.

64. You may have gained a few extra pounds in the past few weeks. Not including those extra pounds, how much do you usually weigh?

_____
(pounds)

65. How tall are you?

_____ _____
(feet) (inches)

Although the following questions may seem personal, none of your responses will in any way be linked with your name. Your answers here will help us a great deal.

66. How old were you the first time you had sex (sexual intercourse)? (Please circle).

I was 7 8 9 10 11 12 13 14 15 16 17 18 19 years old.

67. Please think back to the first time you had sex (sexual intercourse). Did you or your partner use any of the following birth control methods: (Circle as many as apply)

1. no method used
2. rhythm (safe period)
3. withdrawal (pulling out)
4. douche (washing with water, etc.)
5. condom (safe, rubber)
6. diaphragm
7. foam, jelly or cream
8. IUD (loop, copper 7, etc.)
9. pill
10. other (specify) _____
11. don't remember

68. Except for the first time, did/do you and your partner usually use any of the following: (circle as many as apply)

1. we don't use anything
2. rhythm (safe period)
3. withdrawal (pulling out)
4. douche (washing with water, etc.)
5. condom (safe, rubber)
6. diaphragm
7. foam, jelly or cream
8. IUD (loop, copper 7, etc.)
9. pill
10. other (specify) _____

69. At the time you became pregnant, were you or your partner using any of the following: (circle as many as apply)

1. no method used
2. rhythm (safe period)
3. withdrawal (pulling out)
4. douche (washing with water, etc.)
5. condom (safe, rubber)
6. diaphragm
7. foam, jelly or cream
8. IUD (loop, copper 7, etc.)
9. pill
10. other (specify) _____

70. In general would you say you or your partner usually use birth control

1. all of the time
2. some of the time
3. none of the time

71. Sometimes people do not use birth control regularly for many reasons. Below are some reasons people have given for not using birth control. Would you please check ( ) the column that tells whether or not these reasons are true for you.

	True For Me	Not True For Me
a) I don't know about birth control methods		
b) Birth control was not easily or readily available		
c) My partner and/or I do not like the methods of birth control available		
d) I thought it was a safe time		
e) I simply took a chance that I would not get pregnant		
f) Methods of birth control are too much bother		
g) Sex is not as much fun when using birth control methods		
h) I do not approve of birth control		
i) Other (please specify)		

72. Please read each of the statements below and circle the number that best tells how much you agree or disagree with each statement.

1. I strongly disagree
2. I mildly disagree
3. I mildly agree
4. I strongly agree

a)	I would find it embarrassing to learn about all of the different methods of birth control.	1	2	3	4
b)	I would feel uncomfortable if I thought about or planned for intercourse before it occurred.	1	2	3	4
c)	I would find it embarrassing to get birth control from a doctor or a drugstore.	1	2	3	4
d)	I would find it embarrassing to talk about birth control with my sexual partner.	1	2	3	4

73. Being pregnant may mean some changes in your life. The following is a list of some things that may have happened already, might happen to you soon or will not happen to you. Please read each statement carefully.
For each event please show how stressful it was or how stressful it might be by circling 1, 2, or 3.

1. not at all stressful
2. somewhat stressful
3. very stressful

If the event will not happen to you, place a checkmark in the last column.

Because I am pregnant:

	Has Happened to me and was	Might Happen to me and it feels	Will not Happen to me
a) I had to leave school/work for awhile	1 2 3	1 2 3	( )
b) I had to move to a different place (ie. larger apartment, move from parents' home, etc.)	1 2 3	1 2 3	( )
c) Some of my friends have changed	1 2 3	1 2 3	( )
d) I have new expenses (ie. baby clothes, supplies)	1 2 3	1 2 3	( )
e) My relationship with my family has changed	1 2 3	1 2 3	( )
f) My relationship with my husband/boyfriend has changed	1 2 3	1 2 3	( )
g) I don't go out as much as I used to	1 2 3	1 2 3	( )
h) I have had some illness because of my pregnancy	1 2 3	1 2 3	( )

SECTION 8. SOCIAL SUPPORT

74. We would like to know a little bit about your thoughts and feelings about yourself and the people who matter to you. After reading each set of three stories below, please place a check in the box that best describes you.

Debbie	Leslie	Robin
People are devoted to Debbie and love her. They always support her, listen to her and sympathize with her. They care about her a lot.	People are usually fond of Leslie. They can be sympathetic, but do not always listen to her nor support her.	People are not devoted to Robin. They do not support her, listen to her or sympathize with her. They do not care about her or love her.

Check one box.

☐	☐	☐	☐	☐
I'm like Debbie	I'm halfway between Debbie and Leslie	I'm like Leslie	I'm halfway between Leslie and Robin	I'm like Robin

Jane	Kim	Viki
People rarely let Jane know that she is wanted. She does not really make a difference to them and they are rarely concerned about her. She does not matter to them.	People sometimes let Kim know that she matters. Sometimes they think that she makes a difference to them.	People constantly let Viki know that she is wanted. She really makes a difference to them. They are concerned about her and she matters.

75. Check one box.

☐	☐	☐	☐	☐
I'm like Jane	I'm halfway between Jane and Kim	I'm like Kim	I'm halfway between Kim and Viki	I'm like Viki

35.

	Michelle	Jill	Paula
76.	People always think that Michelle is a friend. They like talking with her and spending a lot of time with her. She always has lots of people around. She is seldom alone.	Jill has friends and is a good person to be with, but she isn't always surrounded by people.	Paula is mostly alone. She rarely sees people or spends time with them. She is most often by herself.

Check one box.

a)	☐ I'm like Michelle	☐ I'm halfway between Michelle and Jill	☐ I'm like Jill	☐ I'm halfway between Jill and Paula	☐ I'm like Paula

Some people may care about you and support you more than others. Please tell us by circling the appropriate number how much you think those close to you care about you and support you.

1. not at all
2. a little
3. pretty much
4. very much
5. very, very much

N/A - not applicable

b)	My boyfriend/husband talks with me and spends time with me	1	2	3	4	5	N/A
c)	My parents talk with me and spend time with me	1	2	3	4	5	N/A
d)	My other relatives talk with me and spend time with me	1	2	3	4	5	N/A
e)	My friends talk with me and spend time with me	1	2	3	4	5	N/A
f)	My neighbours talk with me and spend time with me	1	2	3	4	5	N/A
g)	The people I work with talk with me and spend time with me	1	2	3	4	5	N/A
h)	My teachers talk with me and spend time with me	1	2	3	4	5	N/A

36.

	Jenny	Lynn	Shelley
77.	Jenny rarely has a close friend that she can count on. She does not know that they will always be there for her to lean on and she does not support them.	Lynn sometimes has a close friend who is there for her and who she can count on.	Shelley always has a close friend that she can count on. She does not have to worry about whether they will be there for her to lean on. She gives them the same support.

Check one box.

☐	☐	☐	☐	☐
I'm like Jenny	I'm halfway between Jenny and Lynn	I'm like Lynn	I'm halfway between Lynn and Shelley	I'm like Shelley

	Carrie	Cathy	Sharon
78.	People believe that Carrie will make the right decisions and do the right things. They have confidence and faith in her.	Some people have confidence and faith in Cathy. Sometimes they think that she will make the right decisions and do the right things.	People rarely believe that Sharon will make the right decisions or do the right things. They hardly ever have confidence in her.

Check one box.

☐	☐	☐	☐	☐
I'm like Carrie	I'm halfway between Carrie and Cathy	I'm like Cathy	I'm halfway between Cathy and Sharon	I'm like Sharon

	Joanne	Anne	Linda
79.	Joanne rarely spends time with other people. When she wants to do things, she hardly ever has anyone to do things with her.	Anne sometimes spends time with other people. When she wants to do things, sometimes there are other people around to do things with her.	Linda is almost always with other people. Whenever she wants to do things, she knows that one or another of her friends will be there to do things with her.

Check one box.

a)	☐ I'm like Joanne	☐ I'm halfway between Joanne and Anne	☐ I'm like Anne	☐ I'm halfway between Anne and Linda	☐ I'm like Linda

1. not at all
2. a little
3. pretty much
4. very much
5. very, very much

N/A - not applicable

b)	My boyfriend/husband does things with me	1	2	3	4	5	N/A
c)	My parents do things with me	1	2	3	4	5	N/A
d)	My other relatives do things with me	1	2	3	4	5	N/A
e)	My friends do things with me	1	2	3	4	5	N/A
f)	My neighbours do things with me	1	2	3	4	5	N/A
g)	The people I work do things with me	1	2	3	4	5	N/A
h)	My teachers do things with me	1	2	3	4	5	N/A

	Ruth	Sandy	Cindy
80.	Ruth knows that people care a lot about her. She has their attention and support.	Sandy sometimes has people's attention and support. She sometimes feels that they care about her.	Cindy is uncertain that people care about her. She gets little attention or support.

Check one box.

☐	☐	☐	☐	☐
I'm like Ruth	I'm halfway between Ruth and Sandy	I'm like Sandy	I'm halfway between Sandy and Cindy	I'm like Cindy

	Becky	Angie	Beth
81.	Becky is rarely admired and praised. There are very few people who think Becky is important and worthy.	Angie is sometimes admired and praised by some people. She is not always being reminded of her worth.	Beth is constantly being admired by people. They always praise her and think that she is important and worthy.

Check one box.

☐	☐	☐	☐	☐
I'm like Becky	I'm halfway between Becky and Angie	I'm like Angie	I'm halfway between Angie and Beth	I'm like Beth

39.

	Karen	Andrea	Janet
82.	Karen does not have a lot of different people to lean on. She does not belong to a group of people who know each other and would help one another when needed.	Andrea sometimes has people she can lean on. She belongs to a group of people who sometimes help one another when needed.	Janet knows that there are a lot of different people she can lean on. She belongs to a group of many people who know each other and who always help one another out when needed.

Check one box.

a)	☐ I'm like Karen	☐ I'm halfway between Karen and Andrea	☐ I'm like Andrea	☐ I'm halfway between Andrea and Janet	☐ I'm like Janet

1. not at all
2. a little
3. pretty much
4. very much
5. very, very much

N/A - not applicable

b)	I can count on my boyfriend/husband	1	2	3	4	5	N/A
c)	I can count on my parents	1	2	3	4	5	N/A
d)	I can count on my other relatives	1	2	3	4	5	N/A
e)	I can count on my friends	1	2	3	4	5	N/A
f)	I can count on my neighbours	1	2	3	4	5	N/A
g)	I can count on the people I work with	1	2	3	4	5	N/A
h)	I can count on my teachers	1	2	3	4	5	N/A

APPENDIX E

ABSTRACTION FORM

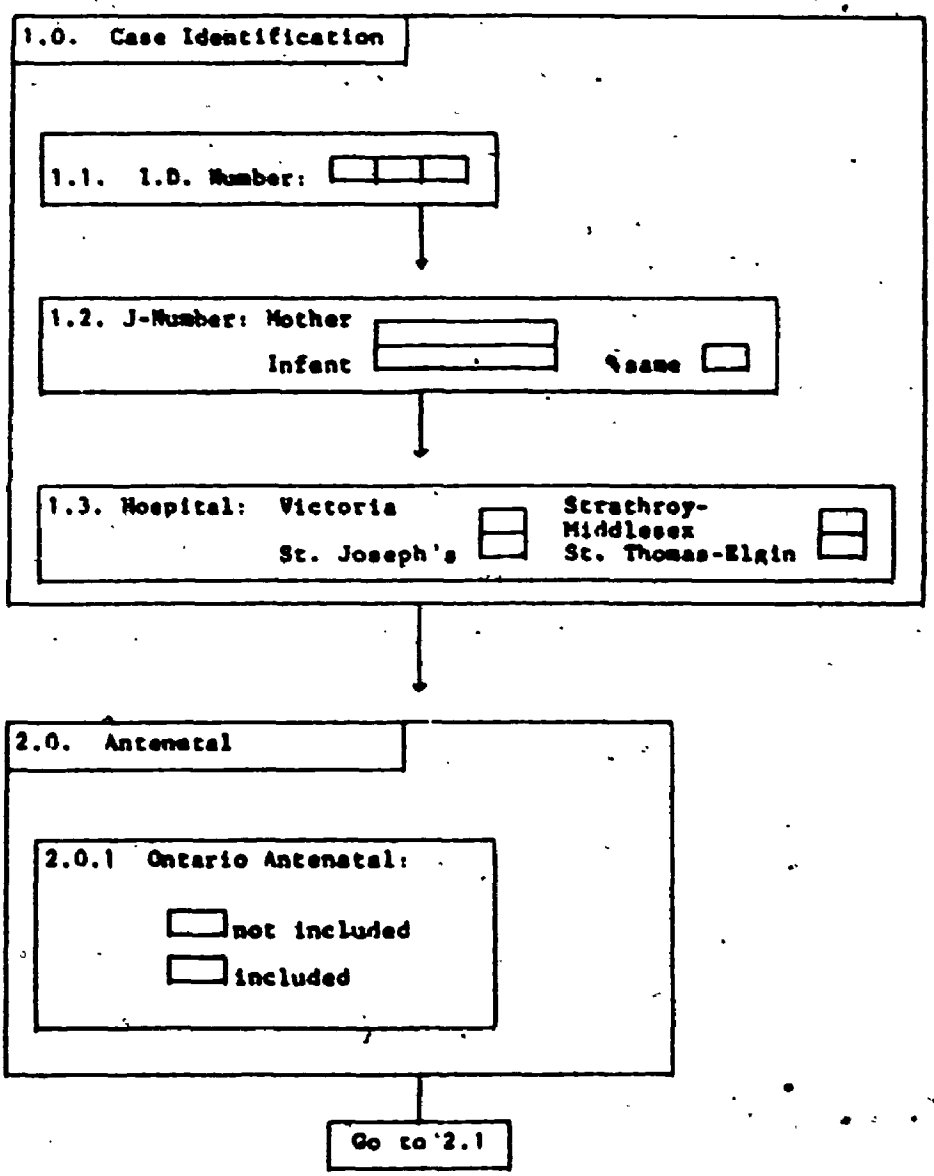
ARSTRACTION FORM

SOCIAL SUPPORT AND OUTCOMES IN TEENAGE PREGNANCY

Health Care Research Unit
The University of Western Ontario

CHART ABSTRACTION INSTRUMENT
Health Care Research Unit
The University of Western Ontario

SOCIAL SUPPORT AND OUTCOMES IN TEENAGE PREGNANCY



I.D. Number: ☐☐☐ 2.

2.0. Antenatal (continued)

2.1. Reproductive History:
(T____ + P____ + (TA____ + S____) + SB____) = _____

2.2. Initial Physical:

2.2.1. Height _____ ☐ in. / ☐ cm.

2.2.2. ppw. _____ ☐ lbs / ☐ kg

2.2.4. B.P. _____ d / s (mm/hg)

2.2.3. p.w. _____ ☐ lbs / ☐ kg

2.2.5. First Antenatal Visit
_____/_____/_____
D M Y

2.2.6. Subsequent visits:
_____ (specify)
number

2.3. Risk

2.3.1. Initial Risk Grade
☐ A
☐ B — Go to 2.3.2
☐ C
☐ N - Go to 5.0

2.3.2. Risk Grade Change
☐ none - go to 2.3.3
TO:
☐ A
☐ B — Go to 2.3.3
☐ C
☐ N - Go to 6.0

2.3.3. Risk Grade @ Admission
☐ A
☐ B
☐ C
☐ N Go to 7.0

Go to 2.4

3.

I.D. Number: ☐☐☐

2.0. Antenatal (continued)

2.4. Admission

2.4.1. Admission Status:

☐ in normal labour
☐ elective for induction
☐ elective for cesarean → Go to 2.4.2

☐ emergency

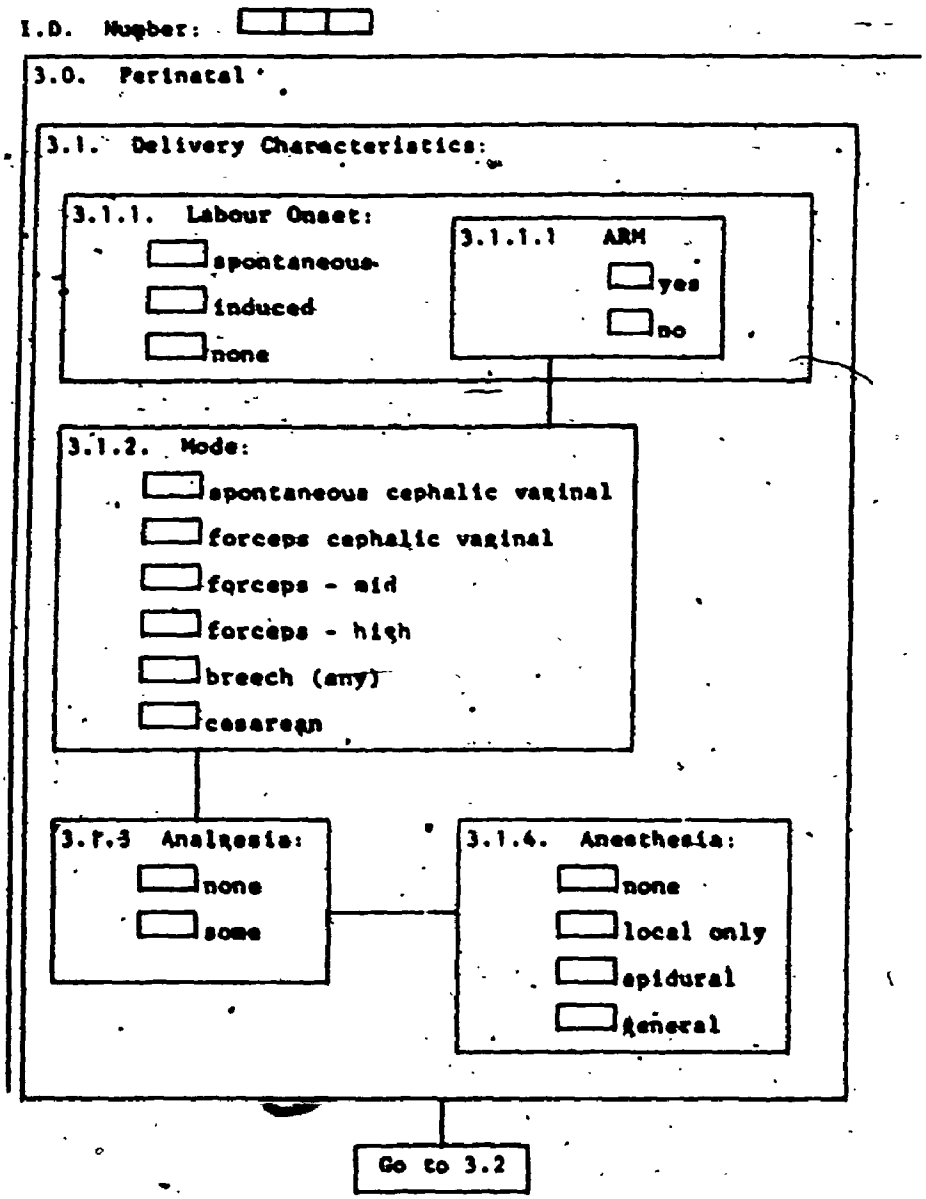
2.4.1.1. Reason:

☐ premature labour
☐ hemorrhage
☐ trauma/accident
☐ eclampsia
☐ other _____ specify

2.4.2. Time:

_____ / _____ / _____
D H Y

Go to 3.0


I.D. Number:
3.0. Perinatal
3.1. Delivery Characteristics:
3.1.1. Labour Onset:
spontaneous
induced
none
3.1.1.1 ARM
yes
no
3.1.2. Mode:
spontaneous cephalic vaginal
forceps cephalic vaginal
forceps - mid
forceps - high
breech (any)
cesarean
3.1.3 Analgesia:
none
some
3.1.4. Anesthesia:
none
local only
epidural
general
Go to 3.2

I.D. Number: ☐☐☐

3.0. Perinatal (continued)

3.2. Infant Characteristics:

3.2.1. Sex:
☐ male
☐ female

3.2.2. Birthweight:
_____ (grams)

3.2.3. Length:
_____ (cms.)

3.2.4. Head Circumference:
_____ (cms.)

3.2.5. Date of Birth:
_____/_____/_____
day month year

3.2.6. Gestational Age Weeks
8.1.6.1 By dates ☐
8.1.6.2 By assessment ☐
8.1.6.3 Recorded ☐

3.2.7. Apgars:
☐ 1 minute
☐ 5 minute

Go to 4.0

6.

I.D. Number: ☐☐☐

4.0. Outcomes

4.1. Maternal Complications:

☐ none - Go to 4.1.1.

	S	P	E	C	I	F	Y
☐ pregnancy course	( )		( )		( )		( )
☐ intrapartum	( )		( )		( )		( )
☐ postpartum	( )		( )		( )		( )

4.1.1. Discharge:
- ☐ no, deceased → 4.1.2. Date: ___/___/___ (D / M / Y)
- ☐ yes

4.2. Infant Complications:

☐ none - Go to 4.2.1

	S	P	E	C	I	F	Y
☐ pregnancy course	( )		( )		( )		( )
☐ intrapartum	( )		( )		( )		( )
☐ postpartum	( )		( )		( )		( )

4.1.1. Discharge:
- ☐ no, deceased → 4.1.2. Date: ___/___/___ (D / M / Y)
- ☐ yes

END CASE

I.D. Number: ☐☐☐

5.0. Risk Assessment

5.1. Incompetent Cervix:

☐ no

☐ yes

5.2. Medical History:

	no	yes
5.2.1 kidney	☐	☐
5.2.2 heart	☐	☐
5.2.3 hypertension	☐	☐
5.2.4 diabetes	☐	☐
5.2.5 infections	☐	☐
5.2.6 rubella	☐	☐
5.2.7 thyroid	☐	☐
5.2.7.1 hypo ☐ hyper ☐		
5.2.8 transfusions	☐	☐
5.2.9 operations	☐	☐
5.2.10 other _____ (specify)	☐	☐

5.3. Obstetrical History:

No.	Year	Sex	G.A.(wks)	Wt.(gms)	Lab.(hrs:min)	Comment
1					:	
2					:	
3					:	
4					:	

5.4. Socioeconomic:

☐ adequate

☐ problematic → Go to 2.3.2

I.D. Number: ☐☐☐

6.0. Initial Visit Pregnancy History (continued)

6.4. Other significant

☐ none - Go to 7.0

	No	Yes
6.4.1 bleeding	☐	☐
6.4.2 vomiting	☐	☐
6.4.3 pyrexia	☐	☐
6.4.4 smoking	☐	☐
6.4.4.1 (cigs/day) ☐		
6.4.5 alcohol	☐	☐
6.4.6 radiation	☐	☐
6.4.7 drug use	☐	☐
6.4.8 dental care	☐	☐
6.4.9 allergies	☐	☐

Go to 2.3.3

8.

I.D. Number: ☐☐☐

6.0. Initial Visit Pregnancy History:

6.1. Previous admission(s) this pregnancy:

☐ no - Go to 6.4

☐ yes

6.2. Admission reason(s):

	( )
6.2.1 I.U.G.R.	☐
6.2.2 bleeding	☐
6.2.3 H.D.P.	☐
6.2.4 surgery _____ specify	☐
6.2.5 premature labour	☐
6.2.6 false labour	☐
6.2.7 dates	☐
6.2.8 hyperemesis	☐
6.2.9 other _____ specify	☐

6.3. Trimester: (#)

	1	2	3	
6.3.1				enter
6.3.2				days
6.3.3				total
6.3.4				per
6.3.5				tri-
6.3.6				mester
6.3.7				
6.3.8				
6.3.9				

Go to 6.4

10.

I.D. Number: ☐☐☐

7.0. Post-initial Pregnancy History

7.1. Pelvic architecture:
- ☐ normal
- ☐ abnormal — 7.1.1 Specify: _____

7.2. RHOGAM:
- ☐ Rh+
- ☐ normal — Go to 7.3
- ☐ abnormal — 7.2.1 titre: ____ : ____

7.3. Blood group:
- ☐ A
- ☐ B
- ☐ AB
- ☐ O
- ☐ other - 7.3.1. Type: _____ specify

7.4. Rh:
- ☐ pos.
- ☐ neg.

7.5. VDRL:
- ☐ pos.
- ☐ neg.

7.6. Rubella titre:
- ☐ normal
- ☐ abnormal - 7.6.1 _____ specify

Go to 7.7

11.

I.D. Number: ☐☐☐

7.0. Post-initial Pregnancy History (continued)

7.7. Amniocentesis:

☐ no - Go to 7.8

☐ yes → 7.7.1 Results:

☐ normal - Go to 7.8

☐ abnormal

7.7.1.1 Abnormality:

☐ cytology

☐ alphafetoprotein

7.8. Antenatal abnormalities:

☐ none - Go to 7.9

7.8.1 Trimester: ☐ thru ☐ → 7.8.1.1 Abnormality: (specify) _____

7.8.2 Trimester: ☐ thru ☐ → 7.8.2.1 Abnormality: (specify) _____

7.8.3 Trimester: ☐ thru ☐ → 7.8.3.1 Abnormality: (specify) _____

APPENDIX F

TABLES

TABLE F.1

DISTRIBUTION OF SMOKING STATUS

SMOKING STATUS	N	PERCENT
Never Smoked	70	34.3
Ex-Smoker	10	4.9
Current Smoker	124	60.8
	204	100.0

NOTE: (1) All ex-smokers were considered as smokers in analysis.

(2) Smoking was used as a dichotomous variable in all analyses and coded as follows: '0' meaning never smoked and '1' meaning ex/current smoker.

TABLE F.2

DISTRIBUTION OF DRINKING STATUS

DRINKING STATUS	N	PERCENT
Never Drank	183	89.7
Ex-drinker	6	2.9
Current Drinker	15	7.4
	204	100.0

NOTE: (1) All ex-drinkers were coded as drinkers in analysis.

(2) Drinking was treated as a dichotomous variable in all analyses and coded as follows: '0' meaning never drank and '1' meaning ex/current drinker.

TABLE F.3

DISTRIBUTION OF ADEQUACY OF PRENATAL CARE

PRENATAL CARE	N	PERCENT
Adequate	159	78.0
Intermediate	8	3.9
Inadequate	37	18.1
	204	100.0

NOTE: Adequacy of prenatal care was used in all analyses as a dichotomous variable coded as follows:

'0' meaning inadequate (combined inadequate and intermediate categories) and '1' meaning adequate care.

TABLE F.4

DISTRIBUTION OF SOCIAL CLASS

SOCIAL CLASS	N	PERCENT
UPPER CLASS		
1	7	3.5
2	12	6.0
MIDDLE CLASS		
3	25	12.4
4	31	15.4
5	44	21.9
LOWER CLASS		
6	56	27.9
7	26	12.9
missing	3	****
	204	100.0

NOTE: Social class was measured using the Hollingshead Occupational codes.

TABLE F.5

DISTRIBUTION OF MARITAL STATUS

MARITAL STATUS	N	PERCENT
Never Married	139	68.1
Common-Law	44	21.6
Married	21	10.3
	204	100.0

NOTE: Marital status was used as a dichotomous variable in analysis with '0' meaning never married and '1' meaning married/common-law.

TABLE F.6

DISTRIBUTION OF LENGTH OF GESTATION

LENGTH OF GESTATION	N	PERCENT	CUMULATIVE
25	1	0.5	0.5
31	1	0.5	1.0
32	1	0.5	1.5
33	1	0.5	2.0
34	3	1.5	3.4
35	1	0.5	3.9
36	5	2.5	6.4
37	9	4.4	10.8
38	12	5.9	16.7
39	37	18.1	34.8
40	104	51.0	85.8
41	18	8.8	94.6
42	10	4.9	99.5
44	1	0.5	100.0
	204	100.1	100.0

NOTE: Gestation was measured as completed weeks and treated as a continuous variable in all analyses.

TABLE F.7

DISTRIBUTION FOR INFANT BIRTH WEIGHT

BIRTH WEIGHT CATEGORIES	N	PERCENT	CUMULATIVE
501 - 750	1	0.5	0.5
1001 - 1250	1	0.5	1.0
1751 - 2000	1	0.5	1.5
2001 - 2251	3	1.5	3.0
2251 - 2500	4	2.0	5.0
2501 - 2750	16	7.8	12.8
2751 - 3000	25	12.3	25.1
3001 - 3250	38	18.6	43.7
3251 - 3500	43	21.1	64.8
3501 - 3750	35	17.2	82.0
3751 - 4000	19	9.3	91.3
4001 - 4250	I3	6.4	97.7
4251 - 4500	4	2.0	99.7
4501 - 4700	1	0.5	100.2
	204	100.2	100.2

NOTE: Birth Weight, measured in grams was used as a continuous variable in all analyses. Birth weight categories of 250 grams were used for ease of presentation in this table.

TABLE F.8

DISTRIBUTION OF TRIMESTER AT INTERVIEW

TRIMESTER	N	PERCENT
First	40	19.6
Second	99	48.5
Third	65	31.9
	204	100.0

TABLE F.9

DISTRIBUTION OF MATERNAL AGE

MATERNAL AGE	N	PERCENT
15	17	8.3
16	30	14.7
17	45	22.1
18	59	28.9
19	45	22.1
20	8	3.9
	204	100.0

NOTE: (1) Maternal age was used as a continuous variable in all analyses.

(2) Women who were 20 years old at interview met the selection criteria of 19 years at conception.

TABLE F.10

DISTRIBUTION OF MATERNAL EDUCATION

GRADE	N	PERCENT
8 or less	22	10.8
9	37	18.1
10	59	28.9
11	40	19.6
12	31	15.2
13	2	1.0
post secondary	13	6.4
	204	100.0

NOTE: Education was measured as last year successfully completed.

TABLE F.11

DISTRIBUTION OF WORK STATUS

WORK STATUS	N	PERCENT
Working	45	22.1
Not Working	49	24.0
Student	110	53.9
	204	100.0

TABLE F.12

DISTRIBUTION OF MOST IMPORTANT SOURCE OF INCOME

SOURCE OF INCOME	N	PERCENT
Government	70	34.3
Wages	66	32.4
Father of the Baby	36	17.6
Parents	13	6.4
Other (baby sitting)	19	9.3
	204	100.0

NOTE: Most important source of income was defined as that source providing the largest amount of money.

TABLE F.13

DISTRIBUTION OF LIFE EVENT STRESS

Life Event Stress Score	N	Percent
2	1	0.5
3	1	0.5
4	7	3.4
5	5	2.5
6	8	3.9
7	10	4.9
8	16	7.8
9	16	7.8
10	2	1.0
11	12	5.9
12	15	7.4
13	19	9.3
14	16	7.8
15	8	3.9
16	11	5.4
17	10	4.9
18	8	3.9
19	9	4.4
20	6	2.9
21	7	3.4
22	1	0.5
23	2	1.0
24	3	1.5
25	2	1.0
26	2	1.0
27	1	0.5
28	2	1.0
29	1	0.5
30	1	0.5
34	1	0.5
35	1	0.5
	204	100.0

NOTE: Life event stress was used as a continuous variable in all analyses. Increasing scores mean increasing life event stress.

TABLE F.14

DISTRIBUTION FOR PREGNANCY RELATED STRESS

Pregnancy Stress Score	N	Percent
0	2	1.0
1	2	1.0
2	3	1.5
3	7	3.4
4	10	4.9
5	8	3.9
6	14	6.9
7	12	5.9
8	27	13.2
9	16	7.8
10	19	9.3
11	23	11.3
12	15	7.4
13	7	3.4
14	12	5.9
15	6	2.9
16	8	3.9
17	6	2.9
18	4	2.0
19	2	1.0
20	1	0.5
	204	100.0

NOTE: Pregnancy related stress was used as a continuous variable in all analyses. Increasing scores mean increasing pregnancy related stress.

TABLE F.15

DISTRIBUTION FOR FINANCIAL STRESS

Financial Stress Score	N	Percent
6	33	16.2
7	33	16.2
8	27	13.2
9	26	12.7
10	14	6.9
11	16	7.8
12	17	8.3
13	8	3.9
14	10	4.9
15	6	2.9
16	4	2.0
17	1	0.5
18	5	2.5
19	1	0.5
22	1	0.5
24	2	1.0
	204	100.0

NOTE: Financial stress was used as a continuous variable in all analyses. Increasing scores mean increasing financial stress.

TABLE F.16

DISTRIBUTION FOR MOTHER SUPPORT

Value	N	Pct	Value	N	Pct	Value	N	Pct	Value	N	Pct
-31	1	0.5	-5	3	1.5	12	3	1.5	30	3	1.5
-28	1	0.5	-4	1	0.5	13	2	1.0	31	3	1.5
-27	1	0.5	-3	2	0.5	15	1	1.0	32	3	1.5
-26	1	0.5	-2	3	1.0	16	8	4.1	34	3	0.5
-25	1	0.5	-1	6	3.0	17	3	1.5	35	1	0.5
-24	3	1.5	0	3	1.5	18	4	2.0	36	1	0.5
-23	2	1.0	1	9	4.6	19	3	1.5	miss	7	***
-17	1	0.5	2	6	3.0	20	12	6.1		204	100
-16	1	0.5	3	4	2.0	21	5	2.5			
-15	1	0.5	4	3	1.5	22	2	1.0			
-13	4	2.0	5	4	2.0	23	5	2.5			
-12	1	0.5	6	2	1.0	24	11	5.6			
-11	1	0.5	7	2	1.0	25	9	4.6			
-10	1	0.5	8	3	1.5	26	5	2.5			
-9	7	3.6	9	3	1.5	27	5	2.5			
-8	1	0.5	10	6	3.0	28	6	3.0			
-6	1	0.5	11	7	3.6	29	5	2.5			

TABLE F.17

DISTRIBUTION FOR FATHER SUPPORT

Value	N	Pct	Value	N	Pct	Value	N	Pct	Value	N	Pct
-37	1	0.5	-2	7	3.4	14	4	2.0	31	1	0.5
-29	2	1.0	-1	2	1.0	15	4	2.0	33	2	1.0
-28	1	0.5	0	2	1.0	16	7	3.4	34	2	1.2
-23	1	0.5	1	3	1.5	17	4	2.0		204	100
-21	1	0.5	2	5	2.5	18	4	2.0			
-18	3	1.5	3	2	1.0	19	6	2.9			
-17	3	1.5	4	3	1.5	20	3	1.5			
-16	2	1.0	5	2	1.0	21	7	3.4			
-15	3	1.5	6	1	0.5	22	7	3.4			
-14	1	0.5	7	2	1.0	23	10	4.9			
-11	3	1.5	8	5	2.5	24	1	0.5			
-10	1	0.5	9	4	2.0	25	2	1.0			
-8	2	1.5	9.2	31	15.2	26	1	0.5			
-6	2	1.0	10	5	2.5	27	8	3.9			
-5	4	2.0	11	3	1.5	28	1	0.5			
-4	4	2.0	12	2	1.0	29	5	2.5			
-3	6	2.9	13	3	1.5	30	2	1.0			

NOTE: Both mother and father support were used as a continuous variable in all analyses.

TABLE F.18

DISTRIBUTION OF PARTNER SUPPORT

Value	N	Pct	Value	N	Pct
5	13	6.4	15	5	2.5
6	6	3.0	16	21	10.4
7	8	4.0	17	15	7.4
8	2	1.0	18	25	12.4
9	7	3.5	19	28	13.9
10	3	1.5	20	47	23.3
11	6	3.0	missing	2	*****
12	3	1.5		204	100.0
13	9	2.0			
14	4	2			

NOTE: Partner support was used as a continuous variable in all analyses. Increasing scores mean increasing partner support.

TABLE F.19

DISTRIBUTION FOR FRIEND SUPPORT

Value	N	Pct	Value	N	Pct	Value	N	Pct
12	1	0.5	28	2	1.0	38	15	7.4
13	1	0.5	29	4	2.0	39	16	7.8
17	2	1.0	30	5	2.5	40	22	10.8
19	1	0.5	31	4	2.0	41	19	9.3
20	1	0.5	32	4	2.0	42	11	5.4
23	2	1.0	33	3	1.5	43	19	9.3
24	1	0.5	34	6	2.9	44	14	6.9
25	5	2.5	35	9	4.0	45	8	3.9
26	1	0.5	36	12	5.9		204	100.0
27	5	2.5	37	11	5.4			

NOTE: Friend support was used as a continuous variable in all analyses. Increasing scores mean increasing friend support.

TABLE F.20

DISTRIBUTION FOR SELF ESTEEM

Value	N	Pct	Value	N	Pct	Value	N	Pct
9	1	0.5	18	1	0.5	25	14	7.0
10	2	1.0	19	1	0.5	26	7	3.5
13	1	0.5	20	7	3.5	27	17	8.5
14	1	0.5	21	7	3.5	28	19	9.5
15	5	2.5	22	13	6.5	29	23	11.5
16	3	1.5	23	8	4.0	30	55	27.5
17	4	2.0	24	11	5.5	missing	4	****
							204	100.0

NOTE: Self esteem was used as a continuous variable in all analyses. Increasing scores mean increasing self esteem.

TABLE F.21

DISTRIBUTION FOR PERSONAL COMPETENCE

Value	N	Pct	Value	N	Pct	Value	N	Pct
9	1	0.5	15	5	2.5	20	25	12.3
10	1	0.5	16	8	3.9	21	31	15.1
12	6	2.9	17	18	8.8	22	25	12.3
13	3	1.5	18	18	8.8	23	16	7.8
14	5	2.5	19	25	12.3	24	17	8.3
							204	100.0

NOTE: Personal competence was used as a continuous variable in all analyses. Increasing scores mean increasing personal competence.

TABLE F.22

DISTRIBUTION FOR PREGRAVID WEIGHT

Value	N	Pct	Value	N	Pct	Value	N	Pct
37.7	2	1.0	53.6	4	2.0	63.6	5	2.5
40.0	1	0.5	54.1	2	1.0	64.0	1	0.5
40.9	1	0.5	54.5	12	5.9	65.0	1	0.5
41.5	1	0.5	54.9	1	0.5	65.9	4	2.0
43.2	6	2.9	55.0	3	1.5	66.2	1	0.5
43.6	2	1.0	55.5	4	2.0	66.8	2	1.0
44.1	3	1.5	55.9	1	0.5	67.6	1	0.5
44.5	4	2.0	56.0	1	0.5	68.0	1	0.5
45.0	2	1.0	56.4	1	0.5	68.2	3	1.5
45.4	1	0.5	56.8	13	6.4	69.5	1	0.5
45.5	3	1.5	56.9	1	0.5	70.4	1	0.5
46.8	2	1.0	57.0	1	0.5	70.5	2	1.0
47.2	1	0.5	57.3	1	0.5	72.2	1	0.5
47.3	1	0.5	57.6	1	0.5	72.5	1	0.5
47.7	5	2.5	58.0	1	0.5	74.1	1	0.5
48.6	2	1.0	58.2	4	2.0	77.3	2	1.0
49.1	4	2.0	58.6	3	1.5	88.6	1	0.5
49.5	4	2.0	58.9	1	0.5	94.1	1	0.5
50.0	9	4.4	59.1	12	5.9		204	100.0
50.5	2	1.0	60.0	5	2.5			
50.9	3	1.5	60.5	2	1.0			
51.4	1	0.5	61.0	1	0.5			
51.8	3	1.5	61.4	10	4.9			
52.3	12	5.9	61.8	2	1.0			
52.4	1	0.5	62.3	1	0.5			
52.7	1	0.5	62.7	2	1.0			
53.0	1	0.5	63.0	2	1.0			
53.2	1	0.5	63.2	1	0.5			

NOTE: Pregravid weight was used as a continuous variable in all analyses.

TABLE F.23

DISTRIBUTION FOR WEIGHT GAIN

Value	N	Pct	Value	N	Pct	Value	N	Pct
			13.7	2	1.0	20.9	1	0.5
-1.4	1	0.5	13.9	1	0.5	21.0	1	0.5
0.9	1	0.5	14.1	4	2.0	21.1	2	1.0
2.3	1	0.5	14.3	11	5.4	21.2	1	0.5
4.4	1	0.5	14.4	2	1.0	21.4	1	0.5
4.5	1	0.5	14.5	3	1.5	21.8	3	1.5
4.6	1	0.5	14.6	2	1.0	22.5	1	0.5
5.0	1	0.5	14.8	1	0.5	22.7	5	2.5
5.3	1	0.5	15.0	4	2.0	22.8	1	0.5
5.4	2	1.0	15.2	2	1.0	23.8	1	0.5
5.9	1	0.5	15.4	1	0.5	24.0	1	0.5
6.4	3	1.5	15.6	2	1.0	24.7	1	0.5
6.8	1	0.5	15.7	1	0.5	25.0	1	0.5
7.3	3	1.5	15.8	2	1.0	25.5	1	0.5
7.4	2	1.0	15.9	9	4.4	25.7	1	0.5
7.5	1	0.5	16.4	1	0.5	26.1	1	0.5
8.1	1	0.5	16.5	1	0.5	26.6	2	1.0
8.2	3	1.5	16.7	1	0.5	27.3	1	0.5
9.0	1	0.5	16.8	3	1.5	29.1	1	0.5
9.1	4	2.0	16.9	1	0.5	29.4	1	0.5
9.4	2	1.0	17.3	2	1.0	31.5	1	0.5
9.5	1	0.5	17.6	1	0.5		204	100.0
9.6	1	0.5	17.8	1	0.5			
10.0	4	2.0	17.9	2	1.0			
10.2	1	0.5	18.0	1	0.5			
10.3	1	0.5	18.1	4	2.0			
10.5	4	2.0	18.2	3	1.5			
10.7	2	1.0	18.3	1	0.5			
10.8	1	0.5	18.6	1	0.5			
10.9	1	0.5	18.8	1	0.5			
11.3	1	0.5	18.9	1	0.5			
11.4	7	3.0	19.0	1	0.5			
11.7	1	0.5	19.4	4	2.0			
11.8	1	0.5	19.5	3	1.5			
12.0	1	0.5	19.6	1	0.5			
12.7	4	2.0	19.8	2	1.0			
13.0	1	0.5	20.0	1	0.5			
13.2	3	1.5	20.3	1	0.5			
13.4	1	0.5	20.5	3	1.5			
13.6	16	7.8	20.6	1	0.5			

NOTE: Weight gain was used as a continuous variable in all analyses.

TABLE F.24

MULTIPLE REGRESSION ANALYSIS FOR SIGNIFICANT VARIABLES EXCLUDING MISSING CASES ON FATHER SUPPORT AND WEIGHT GAIN

DEPENDENT VARIABLE: LENGTH OF GESTATION

Variables	b	Beta		
Weight Gain	0.1	.32*		
Prenatal Care	1.3	.26*	R^2=.20	F=9.88
Alcohol	-1.1	-.17*	p=.0	N=163
Father Support	-0.1	-.15*		

DEPENDENT VARIABLE: BIRTH WEIGHT

Variables	b	Beta		
Weight Gain	34.6	.35*		
Prenatal Care	339.9	.29*	R^2=.27	F=14.92
Alcohol	-345.7	-.20*	p=.0	N=163
Stress	-10.8	-.12		

DEPENDENT VARIABLE: BIRTH WEIGHT

Variables	b	Beta		
Gestation	128.8	.50*		
Weight Gain	20.0	.20*	R^2=.48	F=28.7
Prenatal Care	229.1	.17*	p=.0	N=163
Alcohol	-220.2	-.13*		

NOTE: *P<.05

TABLE F.25

DEFINITIONS OF ADEQUACY OF PRENATAL CARE

Definitions	If Gestation is (weeks)	The Number of Prenatal Visits Must Be:
Adequate (care initiated in the first trimester and)	‹ = 13	› = 1
	14 to 17	› = 2
	18 to 21	› = 3
	22 to 25	› = 4
	26 to 29	› = 5
	30 to 31	› = 6
	32 to 33	› = 7
	34 to 35	› = 8
	› = 36	› = 9
Inadequate (care initiated in the third trimester or)	14 to 21	0
	22 to 29	‹ = 1
	30 to 31	‹ = 2
	32 to 33	‹ = 3
	› = 34	‹ = 4
Intermediate	All combinations other than above.	

Source: Showstack et al. (1984).

TABLE F.26
SCORING SCHEME FOR THE PARENTAL BONDING INSTRUMENT

Protection Items:	Very Like	Somewhat Like	Somewhat Unlike	Very Unlike
Let me do things I like doing	0	1	2	3
Liked me to make own decisions	0	1	2	3
Let me decide things for myself	0	1	2	3
Gave me as much freedom as wanted	0	1	2	3
Let me go out as often as wanted	0	1	2	3
Let me dress any way I pleased	0	1	2	3
Did not want me to grow up .	3	2	1	0
Tried to control everything	3	2	1	0
Invaded my privacy	3	2	1	0
Tended to baby me	3	2	1	0
Tried to make me depend on him	3	2	1	0
Felt I could not look after myself	3	2	1	0
Was overprotective	3	2	1	0
Care Items:				
Spoke with warm and friendly voice	3	2	1	0
Understood my problems and worries	3	2	1	0
Was affectionate to me	3	2	1	0
Enjoyed talking to me	3	2	1	0
Frequently smiled at me	3	2	1	0
Could make me feel better when I was upset	3	2	1	0
Did not help me	0	1	2	3
Emotionally cold to me	0	1	2	3
Did not understand my needs	0	1	2	3
Made me feel I wasn't wanted	0	1	2	3
Did not talk with me very much	0	1	2	3
Did not praise me	0	1	2	3

SOURCE: Parker, G. (1979).

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