

MATERNAL ATTACHMENT TO THE UNBORN CHILD

A COMPARATIVE STUDY

By

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ABSTRACT

Conclusions about the effects of pregnancy in women - how they feel about being pregnant and their attitudes to the unborn child - have been based almost exclusively upon observations of primigravidas. It is claimed that a first pregnancy is more satisfying and/or more stressful than later pregnancies. The research for this thesis suggests that some of these claims are mistaken.

This thesis examines the similarities and the differences between a group of primigravidas and a group of second pregnancy multigravidas on a range of maternal attitudes during pregnancy. The predictions were based on findings from a pilot study conducted at McMaster University Medical Centre. An interview was designed to elicit the women's thoughts and feelings about their expected infant and about themselves as mothers.

Primigravidas and multigravidas were found to be equally positive about the coming baby and equally anxious about their capacities as mothers. The primigravidas reported significantly more anxiety about the welfare of the expected infant and the multigravidas reported significantly more conflict and negative feeling. The common and unique features of a first and a second pregnancy are discussed. The findings suggest that new adaptations and family realignments accompany the birth of each child.

A third sample of women was examined using the same measures. Comparisons were made between a group of multigravidas who had lost an infant by stillbirth or neonatal death and a group of multigravidas without a history of infant loss. Women who had previously lost an infant were found to be still mourning the death of the first infant and less invested in a relationship with the expected infant. The thesis discusses the effects of infant loss upon women and makes recommendations for the clinical management of bereaved mothers.

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CHAPTER ONE

INTRODUCTION

1. Introductory Comments

"In a general mental-health framework, the purpose in studying women's emotions during pregnancy is not solely to determine whether they affect the developing fetus. Childbearing is an important period in a woman's own maturation, and her reactions to its crucial events as they affect her personality development are per se worthy of study. In a broader sense, her reactions throughout the maternity cycle could be expected to affect not only her relationship to her husband, other children, and the family at large but especially her attitudes and later relationship to the child she is bearing".

(Grimm, E., 1967, P.3)

This research study examines one aspect of maternal emotions during pregnancy - the development of a mother's attachment to her unborn child. The object of study is the woman herself. The aim of the study is to examine the ways in which maternal attachment to the unborn child may differ due to differing life circumstances. The effects of parity upon maternal attachment and the effects of previous loss of an infant upon maternal attachment are the two research questions addressed by the study.

The majority of studies examining the development of maternal feelings during pregnancy base their conclusions on samples of women in a first pregnancy (Bibring, 1959; Frommer et al., 1973; Leifer, 1980; Moss & Robson, 1968; Sherefsky & Yarrow, 1973; Robson & Moss,

1970). Most of them fail to comment on the possible specificity of their findings. These sampling procedures have led to generalizations about the nature of the pregnancy experience and to assumptions about differences between women which are based upon a too narrow selection of subjects.

Grete Bibring (1959) writes: "We believe that all women show what look like remarkable, far-reaching psychological changes while they are pregnant" (P.119). Elsewhere she posits that pregnancy is a major turning point in the life of a woman "especially for the primigravida who faces the impact of this event for the first time" (P.119). Shereshefsky and Yarrow (1973) also express the view that primigravidas are particularly subject to the stresses inherent in pregnancy. Both authors saw primigravidas only. Leifer (1980), studying 20 primigravidas, states that "women pregnant for the first time tend to derive more satisfaction from their pregnancies than do women who already have children" (emphases added).

Other investigators who saw only primigravidas are clearer about the possible specificity of their findings. Robson and Moss (1970) comment that "our observations must, of course, be restricted to a population of primiparous mothers..." (P.983). They go on to point out that parity may be one variable that modifies maternal attachment patterns. Judith Lumley (1980a) deliberately omitted multigravidas from her investigation of expectant mothers' image of the fetus because of the possible confounding effects of a previous pregnancy and previous relationship with a child.

A few reports that include both primigravidas and multigravidas (Loesch & Greenberg, 1962; Wenner et al., 1969; Jessner et al., 1970) were not specifically designed to study group comparisons and findings related to parity were unexpected. Clinical impressions and the occasional systematic study (Kaij et al., 1967; Clifford, 1962; Westbrook, 1978a; Doty, 1967) suggest that there may be special problems associated with the decision to have a second or later child.

One of the effects of the focus on primigravidas is that the event of a first pregnancy (or birth of the first child) tends to be regarded as both the beginning and the end of a woman's initiation into parenthood. Bibring (1961) and Rossi (1968) point out that becoming a parent differs from other major life decisions in that it is relatively irrevocable. In Benedek's view (1970b), parenthood is a role that continues and evolves throughout the whole of adult life.

The woman pregnant for the second time has already been, and continues to be a mother and her anticipation of subsequent births is from a different, more reality-based frame of reference. Both numbers and family group structure change with the birth of the first child and will change again with a second. Social theorists von Weise (1932) and Simmel (Coser, 1965) outline the major realignments that take place in the shift from a dyadic group to a triadic group. In the case of a second pregnancy, realignment may be required once again. A new member will join, not a marital dyad

but a family group and the subgroup "siblings" will be introduced into family life for the first time.

It is possible that statements about the common and the unique features of first and later pregnancies are both accurate. There may in fact be broad resemblances and within this, important group differences. At issue is that so far, statements of similarity and difference have been based on little systematic investigation.

As far as is known, there are no systematic studies of the effects of infant loss upon adaptation in a subsequent pregnancy. Clues about the significance of previous loss of an infant come mainly from clinical impressions (Osofsky & Osofsky, 1980; Lewis, 1979; Lewis & Page, 1978; Dunlop, 1979; MacCarthy, 1969) and suggestive evidence from a small number of follow-up studies (Rowe et al., 1978; Wolff et al., 1970; Cullberg, 1972).

This research compares several groups of women on measures of maternal attachment during pregnancy. The main comparison is between a group of primigravidas and a group of second pregnancy multigravidas. A second comparison (with a smaller sample) was made between a group of women who had lost a child in a previous pregnancy and a control group of women who had not experienced a loss of this kind. It was hoped that such a study would help delineate both the common and unique features of first and second pregnancies and contribute to the literature on expectant motherhood in high risk gravidas.

In the next section, the definition and measurement of maternal attachment is discussed. The discussion will include an overview of earlier and more recent thinking about the concepts of attachment and bonding followed by a review of the literature on maternal attachment during pregnancy.

2. The Definition and Measurement of Maternal Attachment

The definition of attachment adopted for purposes of the research is: "the formation of and investment in significant relationships." This definition was chosen because it is broad. It is not limited to a particular subject or object, e.g. the attachment of the child to his or her caretaker; it is not limited to a particular stage of development, e.g., infancy, childhood or adulthood and; it does not describe a particular set of emotions or behaviours to the exclusion of others, e.g., positive but not negative feelings/proximity-seeking behaviours but not avoidance behaviours. It also allows for the possibility of change in significant relationships over time. Maternal attachment during pregnancy is defined as: "the formation of and investment in a significant relationship with the unborn child."

2.1 Background

The term attachment was used by John Bowlby (1958) to describe the affectional tie of a young child to his mother. Bowlby (1969) defines attachment as an affectional bond expressed by a

behavioural system (proximity-seeking behaviour) the function of which is protection. Attachment behaviours (e.g., smiling, looking vocalizing, following and clinging) are activated in the child by absence of or distance from the primary caretaking person. A necessary precondition for attachment is that the infant be capable of discriminating the mother from other individuals and from himself. The infant is considered to be attached sometime during the second half of the first year when a capacity for internal representation has been attained.

Strictly interpreted, Bowlby's definition of attachment does not appear to be suited to the subject of this research; it describes a particular kind of behaviour (proximity-seeking) involving a particular subject (the child) and object (the mother or caretaker) at a particular developmental stage (infancy and early childhood).

Another model which at first glance appears better suited to the research comes from the study of maternal bonding (Kennell et al., 1975; Klaus et al., 1972). These investigators applied ethological theory to the study of maternal to infant attachment in the early postnatal period. The terms attachment or bonding, used interchangeably, are defined as: "a unique emotional relationship between two people which is specific and endures through time." Maternal bonding is indexed by behaviours such as fondling, prolonged gazing and cuddling which serve to maintain proximity and express affection to the infant.

From the standpoint of this research, the bonding model has appeal because the mother is the subject of study. But it also has several limitations: it proposes a time-limited sensitive period for maternal attachment (the first 36 hours after birth) and it assesses a limited range of maternal behaviours (affectionate behaviours). Outcome studies of the effects of extended early postnatal mother-infant contact have failed to substantiate significant effects upon maternal affectionate behaviour (Hales et al., 1977; de Chateau & Wiberg, 1977, Svejda et al., 1972), or at best have revealed very subtle differences (Klaus et al., 1972). Biological events at birth, while providing a facilitatory context for one stage of maternal-infant attachment, do not appear to have a decisive, all or nothing influence.

The bonding model has also been criticized for failing to take into account the dynamic nature of the mother-infant relationship, individual differences in infants, mothers and infant-mother pairs and the influence of situational factors such as the relative availability of support systems and economic advantage vs. disadvantage. Vietze and O'Conner (1981) caution against using affectionate behaviours as the sole indicator of attachment or bonding. They point out that affectionate behaviour in and of itself does not necessarily imply the existence of a bond (affection can be expressed to compensate for negative feelings), nor does absence of such behaviour necessarily preclude a bond between individuals. They also suggest that the study of the

attachment of a mother to her baby begin in pregnancy rather than with the birth of the infant. The possibility that a mother's attachment to her infant begins in pregnancy is acknowledged by-- Kennell et al., (1970). In a recent review, Svejda, Pannabecker and Emde (1982) conclude that the bonding model, with its biologically-based, time-limited sensitive period for attachment, is no longer a useful one.

Bowlby (1969) clearly refers to a mutual relationship between child and mother, but relatively little attention is given to elaborating details of the maternal contribution. Maternal behaviours such as retrieval, nursing and nest building are seen to represent a separate maternal behavioural system. Although expressed by proximity-seeking behaviours on the part of the caretaker, the maternal behavioural system is seen to have its own distinctive releasing mechanisms and biological functions (giving as opposed to receiving protection). On the other hand, Bowlby sees early attachments as forming the basis for all later attachments, and in recent work (Bowlby, 1979), particular attention is given to examining the characteristics of adult attachment. He states: "what for convenience I am terming attachment theory is a way of conceptualizing the propensity of human beings to make strong affectional bonds to particular others...(P.201)." Ainsworth (1972) points out that the concept of attachment aims "to cover important behaviours throughout the life span" even though research has tended to focus upon "a relatively narrow and early portion of that life

span" (P97). In his most recent article, Bowlby (1984) includes relationships with offspring as one of three main types of adult attachments. Yet, in the same article, the distinction between attachment behaviour and parenting behaviour is again-reiterated. The reason for maintaining the distinction appears to lie in his preference for preserving the original model of attachment in which the function of both the attachment bond and its behavioural counterpart, attachment behaviours, is obtaining protection.

2.2 Current Thinking

An alternative approach is to broaden the conceptual model by treating maternal attachment as an expression of one particular kind of affectional bond. Bowlby's argument of distinctive biological processes does not rule out such a conceptualization. Distinctive biological events accompany all stages of development in every human function or capacity, and with this, development continuously evolves and changes. Developmental differences and sex differences in cognitive processes are still included within the area of psychology known as cognitive development. Social relationships are not given another name when at various times during the life span they have different motivations, expressions and participants. Furthermore, caretaking behaviour itself is not confined to mothers. It occurs, if to a somewhat lesser extent, in fathers (Lamb et al., 1982; Parke, 1979), between siblings and amongst peers (Zahn-Waxler, 1979). Adoptive mothers also become attached to their babies.

Gaensbaur and Harmon (1982) point out that while empirical research is furthered by operationalizing concepts such as attachment and bonding, it also results in a tendency to obscure other manifestations of the caregiver-infant relationship. Elsewhere, they (Gaensbauer and Harmon, 1981) emphasize the importance of viewing attachment behaviours in developmental perspective while others (Lamb, 1982; Parke, 1979; Gaensbauer & Harmon, 1981; Vaughn et al., 1979; Bell, 1978; Brazleton et al., 1974) discuss the need to account for the influence of variables such as: the particular relationship under study (e.g. mother-child, father-child), differences in infant temperament, current life circumstances (e.g. presence of emotional stress) and changes in life circumstances over time. Differences in exploratory behaviour such as independent play (diametrically opposed to proximity-seeking) and interest in pleasurable interchange (other than receiving comfort) are also now acknowledged as manifestations of an attachment bond.

Sroufe and Waters (1977) emphasize that research should focus on the organizational properties of the underlying construct, the affectional bond, with measurement geared to qualitative differences in patterns of behaviour rather than quantitative differences in discrete behaviours.

Ainsworth et al., (1978) remind us that the attachment construct implies strong emotion, "not only security, anxiety, fear and anger but also love, grief, jealousy and indeed a full spectrum

of emotions and feelings" (P.23). Her classification of infants according to the security of their attachment (secure attachment and two categories of anxious attachment: anxious/ambivalent and anxious/avoidant attachment) exemplifies the way in which the expression of various affects is used to describe qualitative differences in attachment behaviour (Ainsworth et al., 1978). These patterns of attachment in children were found to be related to early differences in maternal behaviours (responsiveness to infant signals etc.). Ainsworth (1982) points out that the usual criteria in the literature for assessing whether a mother has become attached to her infant resemble the characteristics of the mothers of her securely attached infants. She notes however that despite differences in maternal behaviours (some mothers were more often overwhelmed by irritation and resentment than others), none of the mothers in her sample appeared to lack a bond to her baby.

Pregnancy studies have traditionally examined the many and conflicting feelings that women have towards the coming child and the prospect of motherhood. Leifer (1980) argues that anxiety about the well being of the fetus is a reflection of a developing maternal bond. She, like Bibring et al. (1961), reports that a majority of her subjects shifted towards a negative or ambivalent mood tone and increased anxiety as pregnancy progressed. These events are interpreted as evidence for a developing relationship rather than failure to invest in the relationship.

2.3 Summary

Recent investigations of attachment, although inspired by Bowlby's work, have broadened both the conceptual model and the criteria for attachment. Human attachments are complex transactions at any single point in time. Added to this is the fact that neither individuals or relationships are static. Time passes, development proceeds and new adaptations are called into play. Clarity can be maintained without confining the study of attachment to children and/or a limited range of behaviours or affects. This requires careful definition of 1) who is being studied 2) at what stage of development and 3) what indices of attachment are being used.

The subject of this research is maternal attachment, and pregnancy is regarded as the appropriate place to study the beginnings of how and when a mother becomes attached to her baby. While the multi-determined nature of the attachment relationship is acknowledged, the study does not attempt to assess the infant's contribution, nor does it assess the interaction between mother and infant. The comparative design of the study and the inclusion of a number of additional variables reflects the view that developmental context and current experiential factors are important determinants of attachment patterns. The research is not directly concerned with whether the attachment process is complete by the time the baby is born (although this seems unlikely), nor whether attachment patterns during pregnancy carry over into the postnatal period (although

there is some evidence for this, see Section 3). It is not possible to obtain behavioural observations of an expectant mother interacting with her unborn baby. The maternal attachment bond is therefore measured by sampling a range of maternal perceptions of and feelings towards her baby. While these contain many (even contradictory) components, all of them are treated as essential to, and evidence for, a developing maternal bond.

3. Literature Review

The literature review first outlines some of the major general concepts in the area of women's adaptation to pregnancy and motherhood. Next, the evidence for maternal attachment to the unborn child from clinical/psychoanalytic and from normative investigations is reviewed. Studies of the relationship between current life circumstances and maternal attachment are then described followed by a review of the literature on the effects of infant loss upon maternal attachment.

3.1 General Concepts

In the mental health field, the goal of most investigations of parenthood, including pregnancy, has been to understand the effects of various parenting behaviours on the development of the child. The view that childbearing and parenthood are important periods in a woman's own maturation has been a relatively recent development.

General interest in issues of adult development was stimulated by the work of the ego psychologists (Murray, 1938; Hartmann, 1958), the interpersonal focus of H.S. Sullivan (Mullahy, 1952) and Erikson's life cycle approach to identity (Erikson, 1959). These theorists emphasized that personality is not a stable given but a constantly changing phenomenon. Parenthood is regarded as a crucial event in the transition from adolescence to adulthood.

There is general agreement that pregnancy is a period of considerable upheaval for a woman. Investigators also agree that the emotional changes during pregnancy are based on psychological and biological events operating in conjunction. Major somatic and hormonal changes take place during pregnancy. The regular monthly cycle of ovulation, with rising and falling levels of estrogen, progesterone and prolactin is replaced by rising levels of all three of these hormones to levels which far exceed those secreted during the menstrual cycle. Somatic complaints are common during the first trimester (<12 weeks gestation) and during the third trimester (>28 weeks gestation). During the second trimester (12-28 weeks gestation), women generally report a sense of well-being with increased emotional investment in the baby and motherhood accompanying the first signs of fetal movement (quickening) at approximately 16-18 weeks gestation.

Some difference of opinion exists about the degree of upheaval associated with pregnancy and the best choice of terms to describe this. Grete Bibring (1959) describes pregnancy as a

maturational "crisis", the goal of which is motherhood. Others refer to pregnancy as a "transition" (Rossi, 1968) or a "developmental phase" (Benedek, 1952). Several investigators prefer the term "stress" to "crisis" when describing the emotional changes associated with pregnancy (Rossi, 1968; Caplan, 1960). This debate is largely conceptual, centering in particular around the definition of "crisis". If "pregnancy as crisis" is clearly distinguished from "pregnancy as illness", and "crisis" is defined according to standard dictionary definitions as: "crucial time" or "turning point", then disagreement between investigators virtually disappears.

In reviewing the literature on maternal attachment, emphasis will be placed on observations and findings concerning women's perceptions, thoughts and feelings about their expected infants. Findings, not always referred to as "maternal attachment" in the literature, are reviewed when they were thought relevant to the measures used in this research. The focus is on studies of pregnancy, but several longitudinal studies assessing both pregnancy and the early postnatal period are also included.

3.2 Clinical and Psychoanalytic Studies

The view of pregnancy as "crisis" evolved from clinical observations of women referred for psychotherapy (Deutsch, 1945; Benedek, 1952; Bibring, 1959). Despite producing rather alarming interview material during pregnancy, these women did not show a

proportional degree of disturbance in their histories preceding the pregnancy. In addition, they responded favourably and with relative ease to supportive psychotherapy.

Based on these observations, Bibring et al. (1961) tested the hypothesis that pregnancy, like puberty or menopause, is a normal maturational crisis involving profound endocrine and general somatic as well as psychological changes. Their subjects for the study, a consecutive sample of 15 primigravidas, was assessed at each trimester of pregnancy, at labour and delivery and up to one year postpartum.

Evidence of crisis in their findings was 1) a general turning inward accompanied by increased disengagement from the external world 2) an increase in previous (pre-pregnant) levels of conflict and 3) a regressive shift (increased dependency and passivity) following quickening in the second trimester. Evidence for maturation was 1) changes in self-image 2) moving towards appropriate identifications (e.g. with mother) and 3) a growing emotional investment in the baby as having a separate identity from herself.

Bibring links these psychological changes with particular tasks associated with each of the stages of pregnancy (Bibring et al., 1961). During the first trimester, the task for the woman is to accept and integrate the presence of an essentially foreign body, thus making it a part of herself. With quickening during the second trimester, comes the first signal for recognition of the fetus as a

separate being. The process of differentiating fetus from self continues for the remainder of pregnancy, gradually preparing the woman for the final task: delivery or anatomical (and psychological) separation. Earlier unresolved conflicts are stirred up during pregnancy, particularly around the woman's relationship to her mother. Positive, negative or ambivalent feelings and anxiety are intermingled throughout pregnancy, tending to increase as pregnancy advances. Before quickening, negative feelings and anxieties are focused on the question of acceptance-rejection of the pregnancy (and baby). Following quickening and for the remainder of pregnancy, concerns are about the health and disposition of her baby, expectations and fears about motherhood and the possible impact of the baby upon her life.

Taylor and Hall (1979) describe the development of maternal feelings during pregnancy as a preparation for motherhood along the lines proposed by Bibring. Based on their experience with high risk neonates and their families following birth, they suggest that the psychological complications of premature delivery may be in part because the expectant mother has been unable to complete this preparatory process. Taylor and Hall stress that effective clinical management must take this into consideration.

Clinical observations of others lend support to Bibring's findings and concepts. Winnicott (1958) describes a condition of heightened sensitivity in women which he calls "primary maternal preoccupation". According to Winnicott, this condition develops

during pregnancy and lasts until a few weeks after the birth of the infant. It involves the mother's capacity to become "preoccupied with her own infant to the exclusion of other interests" allowing her to "feel herself into her infant's place and so meet the infant's needs..." (P. 302).

Helena Deutsch (1945) and Therese Benedek (1952, 1970a), using fantasy and dream material from pregnant women in psychoanalysis, describe the full emergence of particular female personality characteristics during pregnancy (introversion and passivity) which they suggest are preparatory for the maternal role. Dreams and fantasies about the baby are in abundance and according to these authors reflect the positive, negative and conflictual elements of the woman's emotional investment in her coming child.

Benedek (1959) sees parenthood as a developmental phase, extending the continuum of earlier developmental phases, and involving the working through of earlier conflictual feelings. In her view, adaptation to pregnancy and the realization of its growth potential depends on the level of psychological adjustment that the woman has previously achieved, psychobiological factors and reality experiences during the pregnancy itself.

Caplan (1960) describes pregnancy as a period of "increased susceptibility to crisis" with certain predictable emotional changes (introversion, passivity and dependency) paralleling hormonal and metabolic changes. His view is somewhat unique in that pregnancy is seen to involve stress, not just for the pregnant woman but for

every member of the family. A state of disequilibrium occurs within each individual and in their relationships to one another which Caplan thinks is better described by the term "pregnant family" than "pregnant woman". The outcome of pregnancy (once again, for the whole family) is dependent not only upon the long-standing personality patterns of the woman but also upon the responses of key helping figures, including spouse or partner, family, community and professionals.

Caplan also describes women's attitudes toward their fetus, their fantasies about the "baby to be" and comments on the implications these have for postnatal mother-infant relationships. Caplan observes that the fetus rarely becomes a reality (as a living organism) to the pregnant woman until quickening and for some women (a minority) it does not become a reality until birth. Some women conceive of the fetus as a person within them very soon after quickening. They ascribe a sex and a personality to the fetus and have quite intense feelings towards or report "a real maternal love" for it in utero. Many mothers also develop a rich fantasy life regarding the image of their baby as they imagine it will be after it is born.

According to Caplan, both attitudes to the fetus and fantasies about the "baby to be" are predictive of the length of the maternal time-lag after birth, i.e., the length of time for the development of full maternal feeling. He reports that women who have an active emotional relationship with their fetus describe

their relationship to the newborn baby as a continuation of the relationship to the fetus and show a remarkable sensitivity to the baby immediately after birth. The maternal time-lag after birth is longer for women who have had no active emotional relationship with their fetus because they are beginning a new relationship with a person who is a stranger to them.

There are methodological drawbacks to the clinical and/or psychoanalytically oriented studies reported so far. Most of them fail to clearly define the characteristics of their population. Those that study special patient populations (e.g., women in psychotherapy), do not include control comparisons. The pre-pregnant personality, used as a baseline for comparisons, is based on retrospective information (history taking). In none of the studies were attempts made to quantify or statistically analyse data. On the other hand, the observations come from experienced clinicians who were in frequent and intensive contact with women during pregnancy and their reports are a valuable source of hypotheses for more systematic study.

3.3 Normative Studies

A number of investigations of pregnancy and/or new parenthood have been done outside the clinical setting. Some were more systematically designed than others. Studies relevant to the development of maternal attachment during pregnancy will be reviewed

here. The results of these studies lend support to some of the more speculative observations reported above.

Leifer (1980) conducted a longitudinal study of 19 women during pregnancy and followed them up after the birth of their babies. All subjects were primigravidas. Subjects were interviewed at five points during pregnancy and the early postpartum period. Of the variables assessed, the ones pertinent to this research are: 1) the degree of emotional attachment to the fetus 2) the mother's attitude to her baby and 3) quality of mood tone and levels of anxiety during pregnancy. The data were quantified but not statistically analysed.

Criteria for ratings of high, moderate or low attachment to the fetus were based on 1) the degree to which the subject expressed a sense of the fetus as a separate organism and 2) indications of emotional closeness provided by reports of activities such as talking to, thinking and daydreaming about the fetus. Leifer found little or no attachment to the fetus expressed during the first trimester of pregnancy. Individual differences in degree of attachment to the fetus in the second trimester predicted with few exceptions to degree of attachment to the baby at two months postpartum. Leifer also reports that the majority of women in her study shifted towards a negative or ambivalent mood tone, increased feelings of anxiety and increased lability as pregnancy progressed. She found that the women who formed an emotional attachment to the fetus were the ones most likely to express anxiety about it's well

being. This finding led Leifer to conclude that anxiety about the fetus is one possible reflection of the developing maternal bond.

As part of a larger longitudinal study of maternal-infant interaction, Robson and Moss (1970) describe normative and atypical patterns of attachment in 54 primiparous mothers during the first three post-partum months. The mothers all had full term pregnancies and infants who were free from birth defects. Maternal attachment was defined as "the extent to which a mother feels that her infant occupies an essential position in her life". Retrospective data concerning the onset, course and determinants of the mother's feelings toward her baby were collected by tape-recorded interview at three-and-a-half months post-partum. Also at their disposal, were data from an interview conducted during the third trimester of pregnancy concerning their subjects' attitudes towards having babies.

They report that "early attachers" i.e., mothers who had experienced immediate and intense attachments to their infants had expressed a very strong investment in having babies in the pregnancy interview. Mothers who were "late attachers" or did not develop an attachment at all, either did not want babies when pregnant or else had babies with deviant behaviour. Their main finding was that the postnatal process of attachment for the average mother was a gradual one, intensifying as the infant exhibited increased social behaviour towards her.

Bibring offers support for the idea that readiness for parenthood is not yet complete at the time of birth. She observes that in some of her cases, the crisis of pregnancy continued after the arrival of the new baby and suggests that the essential maturational changes of becoming a new parent may well take place at that time (Bibring, 1961).

Moss and Robson (1968) using the same sample of 54 primiparous mothers described above, assessed maternal attitudes during pregnancy and subsequently conducted home observations of mother-infant interaction at one and three months postpartum. This particular design was prospective and greater care was taken with all aspects of methodology. The pregnancy interview assessed subjects' attitudes about pregnancy, prospective maternal functioning and experience, and interest and pleasure in caring for infants. Ratings were made on a 9 point scale for the variables, "Degree to Which Baby is Seen in a Positive Sense" and "Interest in Affectionate Contact with Infants". The first of these was defined as "the extent to which the subject viewed a baby as gratifying, pleasant and nonburdensome", the second as "the amount of interest exhibited toward the prospect of holding, cuddling and rocking her infant". Three home observations, each 6 hours long, were carried out. The outcome variable - frequency of maternal-infant mutual visual regard - was measured by a modified time sampling technique. Both of the pregnancy variables were significantly related to frequency of mutual visual regard at one month postpartum.

Shereshefsy and Yarrow (1973) evaluated 57 normal, middle-class, young married couples undergoing a first pregnancy. Data came from repeated psychiatric interviews, a psychological assessment, social casework evaluations, interviews with the husband and input from obstetrics and pediatrics. Among their variables were several concerned with the prospective mothers' feelings about their expected infants. Items such as 1) acceptance of the infant, 2) responsiveness to the infant and 3) confidence in the maternal role together made up the factor "maternal adaptation during pregnancy". Women who adapted well to pregnancy showed the capacity to visualize themselves as mothers during both early and late pregnancy and this factor was also found to be positively related to postpartum maternal adaptation. The majority of women showed a considerable number of emotional shifts during pregnancy, with increases in both anxiety and depressive feelings. However, as pregnancy progressed, they showed increased clarity and confidence in their capacities to mother and a concomitant reduction of anxiety regarding infant care.

Judith Lumley (1980a & 1980b) interviewed 30 primigravidas at each trimester of pregnancy to determine their image of and feelings towards their fetus. A semi-structured interview was used to obtain the data and women were also asked to draw a picture of how they visualized the fetus. During the first trimester (12 weeks gestation), most women underestimated the size and development of the fetus as well as its activities, attributing "formless",

"unattractive" or animal-like features to it. The majority of women had difficulty visualizing the fetus at all or believing that it was really there. Lumley reports a dramatic change in image of and feelings towards the fetus in the second trimester (12-28 weeks gestation). No subjects described the fetus as formless and half referred to it as "baby". Two-thirds saw the fetus as a person and predicted that they would feel grief if they miscarried. Women indicated that two things marked the change in their feelings about the fetus: feeling movement, and being recognised as pregnant by other people (i.e., social confirmation of the pregnancy). During the third trimester (>28 weeks gestation), all women recognised the fetus as fully formed, active and able to cope if born at this stage. Almost all said that the fetus was "a real person", felt that the fetus was affected by the mother (moods etc.), expressed concern about its well-being and predicted grief if the infant were not to survive. More than half the sample sometimes talked to the fetus and more than one-third stroked their abdomen to calm or communicate with the fetus.

In a recent study, Zeanah et al., (1985) found that: 1) both mothers and fathers had stable perceptions of their infant's personality in late pregnancy and in early infancy, and 2) these prenatal perceptions predicted the postnatal perceptions in several dimensions of personality. A modified version of the Carey Infant Temperment Questionnaire was used as the measure of fetal and infant personality and parents were also interviewed (separately) before

and after the birth of the infant. The majority of mothers and fathers reported vivid and elaborate descriptions of their babies' personalities. These perceptions appeared to derive in part from fetal behaviours and in part from parental projections. Zeanah et al. suggest that the interaction between parents and fetus deserves attention in future investigations of infant personality development.

Another source of support for the view that maternal attachment develops during pregnancy comes from studies of grief reactions following the death of newborn infants and the birth of premature infants. Based on descriptions by Kaplan (1960) of "anticipatory grief" in the families of premature babies, Benfield et al. (1976) studied 101 couples of ~~critically~~ ill newborn infants. They report that anticipatory grief scores were similar to those whose infants did not survive the newborn period. Kennell et al. (1970) interviewed 20 women following the death of their infants and rated them for the presence of mourning. They found that every subject mourned even when their baby was nonviable and lived for only an hour. They conclude that "strong affectional bonding appears to begin before physical contact and caretaking..." (P. 344).

3.4 Current Life Circumstances and Maternal Attachment

Several investigators (Grimm, 1967; Larson, 1966; Loesch &

Greenberg, 1962; Shereshefsky & Yarrow, 1973) stress that a realistic picture of pregnancy adaptation must include analysis of the external events that impinge on the pregnant woman.

Cohen (1980), a clinician with a particular interest in "psychologic obstetrics", summarizes what he sees as the main etiologic factors contributing to maladaptation to pregnancy. He concludes that the majority of stressful factors affecting pregnancy adaptation (e.g. poor finances, geographic relocation) turn out to be related to the woman's perception of her support systems rather than a genuine concern about e.g., economics per se. He notes: "Women who perceive themselves as closely affiliated with their families, strongly supported by their husbands emotionally, and well cared for by professionals do not appear to be overly distressed by poor finances or other environmental deprivations" (P. 54). Benedek (1952) states that adaptation to pregnancy may be interfered with when dependent needs remain unfulfilled, or when the woman's feelings towards her husband or her own mother are primarily angry or rejecting. Under normal conditions, when she feels loved, "the pregnant woman's love for herself is transferred to that which is growing in her womb and paves the way for her motherliness" (P. 413).

Helper et al. (1968) asked women what life events they considered would impose the greatest difficulty on adjustment to

pregnancy. The most frequent reply was problems in relation to the baby's father. Grimm and Venet (1966) and Westbrook (1978b) also report significant associations between marital happiness and positive reactions toward pregnancy and the child.

Shereshefsky and Yarrow (1973) included an analysis of the influence of current life situation in their study of adaptation to a first pregnancy. Their variables were: degree of marital adaptation and external stresses not specific to pregnancy. They found that women burdened with more stresses had greater difficulty in accepting and adapting to the pregnancy and later in meeting the demands of the early postnatal period. Couples already involved in serious marital disharmony during pregnancy tended to have more stresses per family than others in the sample. From this latter finding, Shereshefsky and Yarrow suggested that serious marital disharmony was accompanied by a special vulnerability and difficulty in coping preventatively with potentially stressful conditions.

Both Bibring (1959) and Rossi (1968) emphasize the importance of sanctioned support systems for the pregnant woman and express concern that social changes have resulted in the breakdown of traditional supports (religion, extended family, community groups etc.) and increasing isolation of the nuclear family. Larson (1966) and Grimm (1969) claim that adequate support is particularly lacking for multiparous women, partly due to the belief that later childbearing is a less threatening experience for women.

Several investigators have examined the question of planned vs. unplanned conception and adaptation to first pregnancy. Most of these studies (e.g., Bumpass & Westoff, 1970; Ryder, 1973) failed to distinguish between intendedness and wantedness of the child. One investigator who did separate out these influences in a married, middle class sample (Miller, 1978), found that the majority of first conceptions are fully intended and all conceptions that are fully intended result in fully wanted children. Of those that are unintended or "subintended", many are highly wanted at conception and if not, most lead to the birth of a child that is highly wanted by the time it is six months old. Two factors were found to influence degree of wantedness in the face of unplanned pregnancy: 1) traditional attitudes towards female roles was associated with high wantedness, and 2) the occurrence of life events that introduce change into the subjects' lives was associated with low wantedness. In a study of later pregnancy, Lynch (1982) found that unplanned pregnancy (associated for the most part with <2 year spacing), was very strongly associated with "identified stress" in 40 second time mothers. Loesch and Greenberg (1962) studying adaptation to pregnancy in a group of 31 unwed mothers, found that most women never accepted their pregnancy (the infant was placed for adoption), and never progressed beyond the state of debate over acceptance or rejection of the fetus. Based on this finding, they suggest that pregnancy, in and of itself, is not necessarily developmental and in the presence of certain life circumstances

(e.g., when not in conjunction with motherhood), may not even present a developmental opportunity.

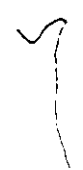
Wenner et al. (1969) and Cohen (1966) also emphasize the importance of the marital relationship and in addition report specific observations of multigravidas. Their subjects were 52 married, mainly middle class women (18 primigravidas and 34 multigravidas), most of whom were referred by their obstetricians for psychotherapy. Subjects were classified by group consensus into one of 5 groups according to the direction that the pregnancy affected the previous adjustment of the subject. Based on these group classifications, they found that increases in the occurrence of marital conflict during pregnancy directly corresponded to increases in problems with pregnancy (i.e., compared to previous levels of adjustment). They also report with some surprise that the percentage of multigravidas in each group directly corresponded to degree of maladaptation to pregnancy, i.e., relatively more (by 50%) multigravidas were classified in groups where adaptation had worsened with pregnancy.

Cohen (1966) notes that Pavenstadt (unpublished communication to Cohen) found a similar pattern amongst lower income multiparous women in Boston. Pavenstadt's evaluations were longitudinal; evaluations of the same subjects after they had had two or three children showed them to be at a lower level of maturity and adjustment than at initial testing early in their first pregnancies. According to Cohen, Pavenstadt felt that their social and economic

situation largely accounted for their downhill course i.e., they were women without much hope for the future, looking forward to little else but a life of drudgery and involuntary childbearing. Clifford (1962) also studied a low income population. Comparing 50 low income primigravidas with 50 low income multigravidas on a self-administered questionnaire during pregnancy, he reports that multigravidas were significantly more irritable during pregnancy and significantly less happy with their marriages. Primigravidas expressed greater fears for the coming baby. Clifford did not analyse for the influence of age in his study and his primigravidas were significantly younger than his multigravidas. He also did not control for number of children.

In Cohen's study reported above, the subjects were reasonably financially secure with considerable freedom of choice about their family size (Cohen, 1966). Cohen does not believe that social and economic factors alone are sufficient to explain the apparent increase in emotional disability with the birth of additional children.

In support of this, Jarrahi-Zedeh et al. (1969) administered the MMPI to 86 upper-middle class women during pregnancy and the early postnatal period. 46 were primipara and 41 were multipara. They found that multiparous women were significantly more depressed during both testings than women having first babies.



Rossi (1968) reviews the literature on the transition to parenthood and arrives at strong conclusions about the effects of increasing parity upon women. She argues:

"It is perhaps culturally and psychologically more difficult to face the possibility that women may find less enjoyment of the maternal role with the passage of time, though women themselves know the difference between the romantic expectation concerning child care and the incorporation of the first baby into the household and the more realistic expectation and sharper assessment of their own abilities to do an adequate job of mothering as they face a third confinement." (P. 34)

Doty (1967) reports findings which suggest an interaction between social class and parity. Her sample consisted of 200 women divided into a middle and a lower class group and further subdivided into primiparous and multiparous groups. Maternal attitudes in pregnancy were assessed by inventory. A maternal checklist of infant behavioural and health problems was also obtained in the postnatal period. Lower class women, particularly multiparas, were found to have more emotional disturbance and express greater rejection of both pregnancy and the maternal role than did other groups of subjects. Primigravidas had significantly more fear of pregnancy and childbirth and greater dependency than multigravidas. They attributed the latter finding to the primiparous mother's relative lack of experience with the problems of childbearing and rearing.

Kaij et al. (1967) were able to rule out the effects of both age and socioeconomic status on the incidence of post-partum

psychiatric disorder in 841 recently delivered women in Sweden. A weakness of the study is that it relied on recall. In three-fifths of the sample, there was an increased incidence of post-partum - psychiatric symptoms with increasing number of full-term pregnancies. They conclude that socioeconomic factors are not the sole explanation for the "worn-out" mother with many children, as is believed in many quarters. On the other hand, Yalom et al. (1968) found more post-partum symptoms (depression and crying) after first births.

Brown and Harris' survey study of depression in working and middle class women in London (Brown & Harris, 1978) is relevant to the question of the influence of both social class and number of children. They found: 1) that among women without children, there was no class difference in risk of developing depression 2) that among women with children, working class women had a significantly greater risk of developing depression than comparable middle class women and 3) that women (both working class and middle class) with three or more children under the age of fourteen living at home were the group at highest risk for developing depression.

The particular stresses associated with the decision to have more than one child are discussed by Jessner et al. (1970). Their observations were based in part upon the group of 52 subjects referred to above (Wenner et al 1969) plus contact with multigravidas in psychoanalytic practice. They found that second, third and fourth pregnancies generally elicited less enthusiasm than

first ones - on the part of the pregnant woman, her spouse and professionals. They also reported that parents had doubts about whether they could provide sufficient care and would be better parents than they had been so far and fears about the first child's competitive envy and hostilities.

Special problems of later childbearing are also reported by Larson in a retrospective study which questioned 130 new mothers about stress during pregnancy and after delivery (Larson, 1966). Of the total sample, 33 were primiparas, 40 had two children and 32 had four or more. Larson reports that stresses changed with each additional birth. During each successive pregnancy, women's fears for the unborn baby and for herself appeared to increase. During successive labors, there was increasing distress over lack of support from the nursing personnel. During successive postpartum periods, the problems of housework and routines within the family multiplied with each increase in family size with particular difficulty in adjusting to the needs of the older children.

Westbrook (1978a) hypothesized that there would be significant differences between the experiences of women of different parity, specifically, that there would be more negative and less positive reactions to later childbearing. Her subjects were 200 women who had recently given birth in Sydney, Australia. The subjects' attitudes to childbearing were rated from retrospective recall of their experiences during the pregnancy, childbirth and early postnatal period.

Westbrook found that all changes occurring with increasing parity were either more negative or less positive, with the exception of lessened stress from problems concerning baby care. She concludes that multiparous women exhibit more signs of being in a crisis situation than first time mothers and that these findings provide no justification for families or medical personnel treating multiparas as less in need of support.

Lynch (1982) described the particular stresses experienced by 40 second time mothers in the first eight weeks after birth. Her subjects were mostly middle to upper-middle class, married and between 18-36 years old. None had high risk pregnancies and the babies were normal and full term. The women were interviewed and then rated on a number of items concerning the infant, the older child the husband and herself. The areas of greatest concern to the mothers were 1) no time for self, inability to get out and feeling tied down 2) fatigue and interruption of sleep 3) change in the relationship with the older child accompanied by doubts about their capacity to mother two children, and among middle to lower class women, 4) husband's increased financial problems. Infant-related caretaking concerns ~~per se~~ were not perceived as stressful by most mothers. The most distinguishing variable was the interval between the two children. Mothers with children less than two years apart and more than six years apart experienced the greatest amount of stress. Initially, 29 mothers planned to return to work. By the time of a second interview only half this number still planned to do

so, claiming that they just could not handle it. Women who had gone back to work expressed difficulty in coping. Unplanned pregnancy (associated for the most part with less than 2 year spacing) was very strongly associated with identified stress and Lynch suggests that this particular family structure may be the most significant cause of stress when a pregnancy is unplanned. Although there were no problems with the new babies per se, there were many concerns that these women had about themselves and their families. Lynch points out that these women were reluctant to call their physician because they "should know better".

Unrelated to stress and pregnancy adaptation, but pertinent to the question of parity and maternal attachment, Feldman and Nash (1978) compared primigravidas and multigravidas on a measure of "interest in babies" in a waiting room situation. Subjects were viewed and rated on their responses to a young infant (smiling, conversation, contact) from behind a one-way mirror. The infant (with his mother) were strangers. Multigravidas showed more interest and were more responsive than women who were expecting their first child. Feldman and Nash concluded that the experience of parenthood rather than pregnancy primes the mother's interest in babies. They interpreted their results as offering support for the experiential rather than hormonal determinants of maternal behaviour. An alternative explanation for the observed differences is that the response of the multigravidas had more to do with confidence with than interest in young infants. Expressions of

interest may have been inhibited by the primigravidas' lack of experience with infants, particularly when faced with a strange infant and it's own, experienced mother.

3.5 Infant Loss and Maternal Attachment

Bourne (1968) has called the birth of a stillborn baby "a non-event" in which there is guilt and shame with no tangible person to mourn. He quotes evidence from a survey to show that family doctors are reluctant to know or remember anything about the patient who has a stillbirth. Lewis (1976) discusses the well meaning conspiracy of silence that follows perinatal death. Hospital staff, family members, friends and the parents themselves tend to behave as though it had not happened. Lewis points out that this attitude, although designed to protect, deprives the parents of the opportunity to mourn their dead baby. Mourning, always difficult, is even more difficult with a perinatal death because there is little or no history as a focus for feelings of grief, less shared experience to remember. And there is also "the loss of what might have been, the loss of experience in the future" (Lewis, 1976 & 1979).

What do bereaved parents themselves tell us about the experience of losing an infant during late pregnancy or at birth?

"What others do not understand is that the parents are grieving for the loss of a very real person"
(Borg & Lasker, 1981, P. 8).

"They have lost not only a fantasy, not only the infant who was seen for a few days or who lived as an image in their minds but a part of themselves, the companion knocking and moving about inside, their heir, their look-alike, their stake in the future" (Borg & Lasker, 1981, P. 15).

If the evidence from the literature review reported in the previous sections is to be treated seriously, there can be little doubt about the validity of this statement. Despite a relatively brief shared history, there is clear evidence, that for the parents, the baby has a unique identity (often rich in detail) well before the actual birth.

John Kennell, in a forward to Borg and Lasker's book, shares his observations of parents from monthly meetings following loss of an infant. A universal concern of these parents is that the world will forget their baby. Parents feel the need for a visible sign to the world (wearing a black armband or placing a black wreath on their door). After their baby dies, they want to keep the memory of the baby alive and are sensitive to any words or actions that seem to depreciate the importance of the baby, even though meant to protect. At every meeting, parents complained that their friends and relatives avoided discussing the baby and the death. Lewis (1979) who criticizes the "rugby pass" management of stillbirth in hospital, believes that parents, if left to their own methods, would do things better.

Lewis (1979) points out that the avoidance of helping professionals extends into neglect of the study of the longer-term effects of perinatal death on the mother and the family.

Clinical follow-up leads MacCarthy (1969) to conclude that families never completely recover from the sudden and unexpected death of a child. Stillbirths and neonatal deaths often left a scar which affected the attitude of the mother to the next birth and newborn infant. Mothers had difficulty committing themselves wholeheartedly to the next child; the life of this child seemed to be inhabited by the ghost of the child who had died. Lewis & Page (1978) point out that infants who are stillborn or die in the neonatal period are idealized and mothers frequently feel resentment towards the nextborn for being alive when the first child is dead, or for not being the first child.

Previous failure to mourn is thought to reduce the chances of good outcome in a subsequent mother-child relationship. Lewis (1977) believes that pregnancy itself creates barriers to the normal process of mourning and that a quick pregnancy following loss of a baby may be motivated by a wish to avoid mourning. A "replacement child" (Poznanski, 1972; Cain & Cain, 1964) allows the parents to deny the first child's death, since a real child exists as a substitute.

According to Lewis (1977), mourning is inhibited during a subsequent pregnancy because of the expectant mother's difficulty in keeping her ideas and feelings about the lost baby separate from

those about the live, expected baby. The intense ambivalence towards the lost person associated with the normal process of bereavement is confused with the milder ambivalence towards the fetus associated with normal pregnancy. The result is that the expectant mother's fears of harming her live fetus are unusually intense and mourning is abandoned to protect the fetus from this ambivalence. Lewis' observations are based on clinical experience with women pregnant again following a stillbirth. His formulations of the mourning process derive from analytic theory (Freud, S., 1917) and studies of adult bereavement (Parkes, C.M., 1972).

Lewis and Page (1978) found that it was particularly following the birth of a subsequent live baby that these women, after a brief period of elation, became depressed and had great difficulty in mothering. During pregnancy, anxiety was particularly intense at the stage when the previous intrauterine death or stillbirth occurred.

Several studies have shown that a high percentage of mothers become pregnant again fairly soon after the death of their first infant (Dunlop, 1979; Wolff et al., 1970; Rowe et al., 1978; Cullberg, 1971). Cullberg (1972) reports that 19 out of 56 mothers (33%), studied one to two years after the deaths of their neonates, had developed severe psychiatric disorders. Symptomatology lasted longer and was more severe in women whose feelings of grief were initially suppressed or denied. Morbid and prolonged grief reactions were found in 6 out of 26 women (23%) in a follow-up study

done by Rowe et al. (1978). These women did not differ from the 20 mothers who showed no evidence of a prolonged grief reaction in age, socioeconomic level, cause of infant death, age of the infant at the time of death, the presence of a child in the home, or the interval between the infant's death and the interview. The only factor associated with a morbid grief reaction was the presence of a new infant in the home, closely following the death of the index child. Women who became pregnant within five months after the death or who had a surviving twin, were significantly more likely to show signs of prolonged morbid grief at the time of the interview than were those who had no subsequent pregnancy or one more than six months later. The investigators are not sure whether the presence of an early subsequent pregnancy interferes with the grieving process (as claimed by Lewis) or whether these parents suffered from a particularly severe grief reaction.

In a follow-up report, Wolff et al. (1970) downplay the risk to women who become pregnant again. A sample of 50 women were followed regularly for three years following the deaths of their infants. All reacted with typical grief reactions and none developed other significant psychiatric difficulties. 50% of this sample became pregnant again and 80% of these pregnancies were planned immediately after the death of the baby. They view another pregnancy as a valid method of helping to resolve grief.

The findings of Wolff et al. (1970) are not directly comparable with the other two studies reported. Firstly, length of

time between the death of the first baby and the subsequent pregnancy was not included as a variable, and secondly, the length and regularity of the follow-up contacts, through possible therapeutic effects, may have had a confounding influence upon the outcome.

With the exception of Wolff et al. (1970), all of the studies reviewed conclude that the potential psychological risks to the parents and the increased risk to the next infant, should temper physicians' enthusiasm for encouraging families to "go right out and have another baby". There is also general agreement that sensitive management of these families (particularly mothers) substantially reduces the risks. Parental participation should be encouraged (Benfield et al., 1978), with special attention to helping parents make the most of what is tangible and can be remembered (Lewis, 1979).

3.6 Summary of the Literature Review

A review of the literature on maternal attitudes and feelings during pregnancy revealed substantial evidence that attachment to the unborn child develops well before the child is actually born. Mothers describe the fetus as possessing detailed physical and personality features and they experience a wide range of feelings towards and about the coming child. These perceptions and feelings appear to be based in part upon cues from the infant e.g., activity level, and in part upon fantasy.

Adequate normative data for women in second or later pregnancies is lacking in this literature. Concentration upon the first time mother has led to assumptions that: 1) first pregnancies are unique, both more satisfying and more stressful than later pregnancies, and 2) all women experience a considerable amount of emotional upheaval during pregnancy. Close examination of the clinical literature and the few existing studies of multigravidas suggested that these assumptions could be in error.

The development of maternal feelings during pregnancy in women who have previously lost an infant by stillbirth or neonatal death proved to be an even more neglected area of study. The majority of the studies reviewed suggests that both the mother and her next infant are likely to be at significant psychological risk following birth.

CHAPTER TWO

THE PILOT STUDY

A pilot study was done in order to examine the value of an interview designed to elicit information about maternal attitudes towards the unborn child. There were two stages to the pilot study. The first stage involved 1) establishing a set of relevant and comprehensive questions 2) determining which particular populations of pregnant women were to be studied and 3) deciding upon an appropriate design for the study. The second stage involved the formal testing of two hypotheses about group differences in maternal attachment.

1. The Setting and Initial Procedure

Medical staff in the Department of Obstetrics and Gynaecology at McMaster University Medical Centre are actively involved in teaching and research as well as clinical service. They were receptive to the idea of a study of prenatal attachment and provided generous access to a wide variety of obstetrical patients. The nursing staff of each clinic introduced the research project and the researcher to individual patients in an efficient and helpful manner. Patients were asked whether they would be willing to remain after their prenatal examination to talk with a student who was planning a study of women's attitudes and feelings about their coming babies. An interviewing room was

obtained near the clinic. Subjects were seen individually. All interviews were done by the investigator.

The pilot interviews took place between January 1982 and January 1983. 50 pregnant women answered questions about their feelings and attitudes towards their unborn babies. All women were between 24-35 weeks of pregnancy. There was a mixture of primigravidas and second, third and fourth pregnancy multigravidas. Pregnancies were at varying degrees of risk and obstetrical histories also varied. Some women had histories of uncomplicated pregnancies and/or deliveries while others had histories of high risk previous pregnancies, including losses by miscarriage, stillbirth or neonatal death.

A preliminary set of questions had been prepared from a review of the literature on prenatal attachment, discussion with obstetrical staff and the researcher's own ideas. Subjects were encouraged to respond frankly and to comment on the relevance of each question. They were also asked if there were areas, important to them, which had been omitted from the interview.

This broad initial approach to selection made it possible to record the attitudes and feelings of many different groups of women. Clinically, women who had previously lost a baby presented very differently from women who had not experienced a loss. They were anxious and defensive in the interview, deliberately distancing themselves from discussing feelings about the coming baby. Women in later pregnancies appeared similar in some respects to women in first pregnancies, despite differences

in parity. They seemed involved, concerned, and looked forward to the new birth, if somewhat less ecstatically than primigravidas. In other respects multigravidas appeared different. Already mothers, they were not as self-assured as is commonly assumed and comments about the negative aspects of motherhood flowed somewhat more freely than was the case for women pregnant for the first time.

2. The Formal Pilot Study

Based upon these observations and the literature review, the following predictions were made:

Hypothesis 1: Primigravidas will show greater attachment to the unborn child than multigravidas on all measures except: negative feeling and conflict.

Hypothesis 2: Negative feeling and conflict will be greater among multigravidas.

2.1 Method

Data for 12 primigravidas and 12 second pregnancy multigravidas who met the following selection criteria were set aside for analysis. Subjects were between 28-32 weeks of pregnancy, 20-35 years of age, married or living with the father of the baby, English speaking, with no known history of psychiatric illness and not categorized as at risk pregnancies. The rest of the subjects were discarded from the analysis.

A group match was obtained for both age and maternal education. A t-test for differences in age between primigravidas

and multigravidas was not significant. A chi-square test between groups, according to whether subjects had secondary or post-secondary education, was also not significant. Details of the age and socioeconomic status of the pilot sample are in Table 1.

The interview for the pilot study (Appendix B) consisted of 8 variables (Appendix D). Two variables, Postnatal Picture and Communication with the Baby, which were eventually included in the main study, were not a part of the pilot study because data were incomplete, making sample sizes too small for analysis.

Some variables were measured with one interview question, others with two or three questions. When variables were measured with more than one question, each question was treated as a separate dimension of that variable.

The eight maternal attachment variables were:

Variable 1 - Image of the Baby: degree of clarity and specificity in the perception of the baby's identity. Three interview questions measured:

1. Sex of the Baby
2. Appearance of the Baby
3. Personality of the Baby

Variable 2 - Thoughts about the Baby: the frequency, duration and intensity of thoughts about the baby. Three interview questions measured:

4. Frequency of Thoughts
5. Duration of Thoughts
6. Intensity of Thoughts

Variable 3 - Positive Feeling: degree of positive feeling about the baby. One interview question measured:

7. Positive Feeling

Table 1 Age and education of the pilot sample

| | <u>Primigravidas</u> (n=12) | <u>Multi-gravidas</u> (n=12) | <u>Total</u> (n=24) |
|-----------------------|--------------------------------|---------------------------------|------------------------|
| <u>Age (in years)</u> | | | |
| Range | 20-32 | 22-32 | 20-32 |
| Mean | 25.67 | 27.17 | 26.42 |
| Standard deviation | 4.19 | 2.62 | 3.50 |

$$t = 1.05, 11df, p = .31$$

Maternal Education

| | | | |
|----------------|-----|-----|------|
| Secondary | n=6 | n=5 | n=11 |
| Post-secondary | n=6 | n=7 | n=13 |

$$\chi^2 = .17, 1df, p = 1.00$$

Variable 4 - Negative Feeling: degree of negative feeling about the baby. One interview question measured:

8. Negative Feeling

Variable 5 - Conflict: degree of conflict about the baby. One interview question measured:

9. Conflict

Variable 6 - Anxiety-Health of Baby: degree of anxiety about the physical and/or emotional health of the baby. One interview question measured:

10. Anxiety-Health of Baby

Variable 7 - Anxiety-Self as Mother: degree of anxiety about her capacities as a mother. One interview question measured:

11. Anxiety-Self as Mother

Variable 8 - Global Score: the overall balance of positive and negative feeling about the baby. One interview question measured:

12. Global Score

Responses to each interview question were classified into either three or four categories (see Appendix D). Decisions about the number of categories and the category names were based on what best described the observed responses and response differences. For example, the category name "clear" was chosen rather than "moderate", because it was thought to best represent the definition: "feelings are clearly stated at some point during the interview.." (see Appendix D, Variables 11-15).

Evidence for the reliability of the interview measures was not available at the time of the pilot study (see Section 5.4).

2.2 Data Analysis

Data was analysed using the chi-square test for independent groups. When chi-square contingency tables are larger than 2×2 , (i.e., $df=1$), the chi-square test can be meaningfully applied only when fewer than 20% of the cells have an expected frequency of less than 5 and no cell has an expected frequency of less than 1. Because of the small sample sizes ($n=12$ per group) and the distribution of scores across three to four categories, the data in no case met these requirements. This problem was dealt with by combining adjacent scoring categories, thereby reducing each variable to two categories. For example "no image" and ²some image" of the baby were combined into one category called "little or no image" of the baby. The new scoring categories were recoded and relabelled in as straightforward a way as possible. Table 2 describes the original scoring categories and their recombinations. In this table, variables sharing the same scoring breakdown are grouped together. The recombinations resulted in dichotomous categories. Therefore, Fisher's Exact Probability Test was applied to all analyses. Because the direction of differences was predicted, one-tailed tests of significance were used.

Table 2 The main variables, their original scoring categories and recombinations

Variable 1: Image of the Baby (Sex, Appearance and Personality)

| <u>Original labels</u> | <u>Code</u> | <u>Recombination</u> |
|------------------------|-------------|----------------------|
| no image | 0 | 0 little or no image |
| some image | 1 | 1 clear image |
| clear image | 2 | |

Variable 2: Thoughts about the Baby

Frequency of Thoughts

| <u>Original labels</u> | <u>Code</u> | <u>Recombination</u> |
|------------------------|-------------|------------------------|
| <5 times a day | 0 | 0 up to 10 times a day |
| 5-10 times a day | 1 | |
| 11-20 times a day | 2 | 1 >10 times a day |
| constantly | 3 | |

Duration of Thoughts

| <u>Original labels</u> | <u>Code</u> | <u>Recombination</u> |
|------------------------|-------------|----------------------|
| <5 minutes | 0 | 0 <5 minutes |
| 5-20 minutes | 1 | 1 5 or more minutes |
| >20 minutes | 2 | |

Intensity of Thoughts

| <u>Original labels</u> | <u>Code</u> | <u>Recombination</u> |
|------------------------|-------------|----------------------|
| mild | 0 | 0 mild to moderate |
| moderate | 1 | 1 strong |
| strong | 2 | |
| very strong | 3 | |

Table 2 cont. The main variables, their original scoring categories and recombinations

Variables 3-7: Positive Feeling, Negative Feeling, Conflict, Anxiety-Health of Baby and Anxiety-Self as Mother

| <u>Original labels</u> | <u>Code</u> | <u>Recombination</u> |
|------------------------|-------------|----------------------|
| no | 0 | > 0 little or no |
| some | 1 | |
| clear | 2 | > 1 clear |
| very | 3 | |

Variable 8: Global Score

| <u>Original labels</u> | <u>Code</u> | <u>Recombination</u> |
|------------------------|-------------|------------------------------|
| neutral | 0 | eliminated |
| mostly negative | 1 | > 0 mixed or mostly negative |
| mixed | 2 | |
| mostly positive | 3 | > 1 mostly positive |

2.3 Results

Image of the Baby

The differences between primigravidas and multigravidas for the three measures of Image of the Baby were not significant (see Table 3).

Thoughts about the Baby

The differences between primigravidas and multigravidas for the three measures of Thoughts about the Baby were also not significant (Table 3).

Positive Feeling

There was no significant difference between primigravidas and multigravidas for Positive Feeling about the expected baby (Table 3).

Negative Feeling

The difference between primigravidas and multigravidas for Negative Feeling was not significant (Table 3). However, when scoring categories were recombined according to whether subjects reported any negative feeling (categories 1-3) as opposed to no negative feeling (category 0), a significant difference was found (Tables 3 and 4). The multigravidas reported negative feeling about the coming baby significantly more often than the primigravidas ($\chi^2 = 4.80$, 1df, $p = .05$).

Table 3 Comparisons of primigravidas and multigravidas
for maternal attachment in pregnancy

| <u>Variable</u> | <u>X² (1-tailed)</u> | <u>df</u> | <u>p</u> |
|---|---------------------------------|-----------|----------|
| <u>Image of Baby</u> | | | |
| Sex of Baby | .00 | 1 | .68 |
| Appearance of the Baby | .18 | 1 | .50 |
| Personality of the Baby | 1.20 | 1 | .30 |
| <u>Thoughts about the Baby</u> | | | |
| Frequency of Thoughts | .69 | 1 | .34 |
| Duration of Thoughts | .25 | 1 | .50 |
| Intensity of Thoughts | .00 | 1 | .66 |
| <u>Positive Feeling</u> | .00 | 1 | .76 |
| <u>Negative Feeling</u> | .00 | 1 | .67 |
| <u>Negative Feeling</u> (recombined) | 4.80 | 1 | .05* |
| <u>Conflict</u> | 1.11 | 1 | .26 |
| <u>Anxiety-Health of Baby</u> | 1.60 | 1 | .20 |
| <u>Anxiety-Self as Mother</u> | .00 | 1 | .68 |
| <u>Anxiety-Self as Mother</u> (recombined) | 2.27 | 1 | .16 |
| <u>Global Score</u> | .69 | 1 | .34 |

* statistically significant

Table 4 Comparisons of primigravidas and multigravidas
for Negative Feeling during pregnancy

| <u>Negative Feeling</u> | <u>Group</u> | | <u>Total</u> |
|-------------------------|----------------------|----------------------|--------------|
| | <u>Primigravidas</u> | <u>Multigravidas</u> | |
| NO NEGATIVE | 4 | 0 | 4 |
| NEGATIVE | 8 | 12 | 20 |
| <u>Total</u> | 12 | 12 | 24 |

$$\chi^2 = 4.80, 1df, p = .05$$

Conflict

The difference between primigravidas and multigravidas for Conflict was not significant (see Tables 3 and 5).

Anxiety-Health of Baby

None of the subjects reported "no anxiety" about the health of the baby. This category was therefore eliminated and subjects were scored according to whether they were "very anxious" or "moderately anxious". Although the difference did not reach significance, the primigravidas tended to be somewhat more anxious about the health of their babies than multigravidas (see Tables 3 and 6).

Anxiety-Self as Mother

Based on the original scoring breakdown, the difference between primigravidas and multigravidas in anxiety about themselves as mothers was not significant. However, when subjects were classified according to whether they were "very anxious" (category 3) or "mild to moderately anxious" (categories 0-2), a difference became more apparent. A tendency was found for the primigravidas to be somewhat more anxious about themselves as mothers than the multigravidas (Tables 3 and 7).

Global Score

The difference between the two groups for the Global Score (balance of positive and negative feeling) was not significant.

Table 5 Comparisons of primigravidas and multigravidas
for Conflict during pregnancy

| <u>Conflict</u> | <u>Group</u> | | <u>Total</u> |
|-----------------|----------------------|----------------------|--------------|
| | <u>Primigravidas</u> | <u>Multigravidas</u> | |
| LITTLE OR NO | 7 | 4 | 11 |
| CLEAR | 5 | 8 | 13 |
| <u>Total</u> | 12 | 12 | 24 |

$$\chi^2 = 1.11, 1df, p = .26$$

Table 6 Comparisons of primigravidas and multigravidas
for Anxiety-Health of Baby

| <u>Anxiety-</u> <u>Health of Baby</u> | <u>Group</u> | | <u>Total</u> |
|--|----------------------|----------------------|--------------|
| | <u>Primigravidas</u> | <u>Multigravidas</u> | |
| MODERATELY ANXIOUS | 6 | 9 | 15 |
| VERY ANXIOUS | 6 | 3 | 9 |
| <u>Total</u> | 12 | 12 | 24 |

$$\chi^2 = 1.60, 1df, p = .20$$

Table 7 Comparisons of primigravidas and multigravidas
for Anxiety-Self as Mother

| <u>Anxiety-</u> <u>Self as Mother</u> | <u>Group</u> | | <u>Total</u> |
|--|----------------------|----------------------|--------------|
| | <u>Primigravidas</u> | <u>Multigravidas</u> | |
| MILD-MODERATELY | | | |
| ANXIOUS | 8 | 11 | 19 |
| VERY ANXIOUS | 4 | 1 | 5 |
| <u>Total</u> | 12 | 12 | 24 |

$$X^2 = 2.27, 1df, p = .16$$

2.4. Summary and Discussion of the Pilot Results

The prediction that women in a first pregnancy would show greater attachment to their unborn child than women in a second pregnancy (Hypothesis 1) was not confirmed. From ten measures of maternal attachment, the primigravidas reported somewhat more anxiety about the health of their babies and about their capacities as mothers than the multigravidas. The differences however, were not significant.

The prediction that negative feeling and conflict would be greater among multigravidas (Hypothesis 2) was in part confirmed. The multigravidas reported significantly more negative feeling than the primigravidas. The difference between groups for conflict about the baby was not significant.

The results suggest that during the third trimester of pregnancy, women in a second pregnancy resemble those in a first pregnancy in many respects. They as often assign an identity to their unborn babies (sex, appearance and personality), feel as positively about them and think about them as frequently, as intensely and for equally long periods of time. For primigravidas, attachment to the unborn child appears to be accompanied by somewhat greater anxiety and for multigravidas, by significantly greater negative feeling.

One purpose of the pilot interviewing was to determine the final content and format of the interview. This meant that procedure had to be flexible with far more discussion than would normally occur in a controlled experimental situation. There was

also no evidence that the instrument or scoring methods were reliable. In view of these weaknesses and the small sample size, the results of the pilot investigation must be regarded as preliminary. It was thought that the hypothesized differences between primigravidas and multigravidas might emerge more clearly with a larger sample and more refined procedures. The findings of similarity between the two groups are of interest because of the possibility that first pregnancy may not be as unique as is generally thought. A decision was therefore made to proceed with a larger study of primigravidas and multigravidas and to include longitudinal comparisons by adding an early pregnancy interview.

Formal pilot testing had not been done for women who had previously lost an infant. However, observations during the initial interviewing suggested that the responses of these women were quite different in some respects from the responses of women who had not had this experience. For the final study, these observations were formally tested by comparing a group of women who had previously lost an infant by stillbirth or neonatal death with a group who had previously given birth to healthy infants.

3. Hypotheses for the Main Study

A review of past work, current thinking and the results of a pilot study led to the following main hypotheses concerning maternal attachment to the unborn child:

Hypothesis 1: Primigravidas will show greater attachment to the unborn child than multigravidas for all measures except: negative feeling and conflict.

Hypothesis 2: Negative feeling and conflict will be greater among multigravidas.


Hypothesis 3: Both primigravidas and multigravidas will show an increase in attachment as pregnancy advances.

Hypothesis 4: Women who have lost a child in an earlier pregnancy will show less attachment to the unborn child than women who have previously given birth to a healthy infant for all measures except: anxiety about the health of the baby.

Hypothesis 5: Anxiety about the health of the baby will be greater among women who have previously lost a child.

Hypothesis 6: Women who have lost a child will show a lesser increase in attachment than women who have previously given birth to a healthy infant.

Predictions for hypotheses 1, 2, 4 and 5 apply to maternal attachment at both early and late stages of pregnancy. Maternal attachment is defined as: "the formation of and investment in a significant relationship with the unborn child". Attachment is measured with ten variables reflecting the women's perceptions, thoughts and feelings about their expected infants. All variables, whether positive or negative in quality are interpreted as evidence for a developing relationship.



CHAPTER THREE

METHOD

1. Design

Two considerations governed the design of the study. The first was how best to describe maternal attachment in a first as compared to a second pregnancy (first and second hypotheses). The second consideration was how to describe change from early to late stages of pregnancy (third hypothesis). Different designs were selected to meet each of these requirements. These two questions (group differences in attachment; change over time), were then studied in a group of women who had lost a baby during their first pregnancy (fourth, fifth and sixth hypotheses).

Comparisons between first and second pregnancies were made using a cross-sectional design. Change from early to late pregnancy was studied using a longitudinal design. These designs and the reasons for choosing them will be discussed under the following headings:

- a) Design for the first and second hypothesis
- b) Design for the third hypothesis
- c) Designs for the fourth, fifth and sixth hypotheses

1.1 Design for the First and Second Hypotheses

A cross-sectional design was used to compare maternal attachment in first and second pregnancies. The best choice for

a comparison of this kind is a longitudinal design where measures at the time of each subjects's first pregnancy can be compared to measures at the time of that same subject's second pregnancy. This keeps individuals constant on comparison measures, thereby reducing the variability due to individual differences.

Practical considerations made it impossible to use such a longitudinal design. There is no guarantee that subjects in a first pregnancy will go on to have a second pregnancy and even if they do, the differing lengths of time between pregnancies and the occurrence of other life events must introduce other major confounding variables.

Another tack would be to collect current data from a group of multigravida subjects and enquire retrospectively for data concerning the time of their first pregnancy. This design was rejected because the disadvantages of relying on subjective and retrospective report outweigh the advantages of a prospective and objective study.

The cross-sectional design made it possible to complete the study in a manageable time and to obtain current rather than retrospective data about maternal attachment. With such a design, where the two groups consist of different individuals, one must give attention to selection criteria and/or matching in order to reduce the greater variance likely to occur in the results.

1.2 Design for the Third Hypothesis

A longitudinal design was used to describe changes in maternal attachment from early to late stages of pregnancy. The plan was to assess subjects on two occasions: 1) between 18-22 weeks pregnancy and 2) between 30-34 weeks pregnancy. The first occasion will be called the early pregnancy interview (or measure) and the second occasion will be called the late pregnancy interview (or measure).

1.3 Design for the Fourth, Fifth and Sixth Hypotheses

A cross-sectional design had to be used to compare subjects who had previously lost a baby with subjects who had no history of loss. Change from early to late pregnancy was measured using the same longitudinal design as used for the main sample.

2. Subjects

- The subjects for the comparisons between first and second pregnancy and for change in attachment will be called the main sample; subjects for studying the effects of previous loss (including change) will be called the loss sample. The discussion is organized under the following headings:

- a) Sample size
- b) Selection criteria
- c) Subject selection
- d) Matching

2.1 Sample Size

Findings from the pilot study were used to calculate the size of sample required for testing the main sample hypotheses. Proportional differences between pilot primigravidas and pilot multigravidas ranged from 0 to .42. A proportional difference of .25 was by far the most frequent. Because the direction of differences expected was predicted, criteria for a one-tailed test were adopted. The proportional difference of .25 or 25% between groups with an alpha of .05 and a beta of .80 yielded a sample size of 43.4 subjects (Snedecor & Cochran, 1967). This was adopted as an acceptable sample size for the main study.

Pilot data were not available for subjects with a history of loss. However, impressions of differences between these subjects and multigravidas with no previous history of loss suggested proportional differences large enough to provide sufficient predictive power with a small sample size on at least some of the measures. Since observations for this sample were primarily exploratory, less stringent criteria for establishing predictive power were thought to be reasonable. It was decided to collect as many loss subjects as possible during the time required to complete the main sample. Sample size was estimated at between 10 and 15 subjects.

2.2 Selection Criteria

The selection criteria for the main sample, including a justification for these criteria, will be described first. This

is followed by a description of the selection criteria for the loss sample.

2.2.1 Selection Criteria for the Main Sample

Subjects for the main sample had to be:

1. between 18-22 weeks of a first or second pregnancy
2. attending McMaster Medical Centre antenatal clinics
3. between 20-35 years of age
4. married or living with the father of the child
5. English speaking
6. without a known history of psychiatric illness
7. categorized as low risk for unfavourable outcome according to the McMaster Risk Score Instrument (Appendix E).

2.2.2 Additional Selection Criteria for the Main Sample

An additional criterion for the study was that multigravidas fulfil Criteria 2-7 at the time of their first pregnancy. This was accomplished for all but Criteria 7 where a total of six subjects had been classified as a pregnancy risk (although not high risk) because of complications during their first pregnancy. Three of these were post-date pregnancies with induced deliveries and two had premature labour which was controlled by medication. One other multigravida had to be hospitalized for high blood pressure during her third trimester.

2.2.3 Justification of the Main Sample Selection Criteria:

The 18-22 week gestational period was chosen because it is a stage when the majority of women have perceived at least some sign of fetal movement (quickening) and are beginning to show the first outward signs of pregnancy. A more sensitive measure of change in attachment from early to late pregnancy might be obtainable by using subjects between 12-14 weeks gestation in which case the majority of subjects would not yet have experienced fetal movement. This was impractical because a number of patients did not come to the clinics until 15 or 16 weeks gestation. Still others could not be approached because of a decision to request participation in the research no sooner than the second visit. Choice of a stage between these (e.g., 16-20 weeks gestation) would have maximized differences between women thereby maximizing the confounding effects of quickening upon the main variables.

The exclusion of subjects in third or later pregnancies is not intended to suggest that they are less important for study or that they are equivalent to a second pregnancy. This decision was made to increase the likelihood of obtaining subjects who fulfilled all of the selection criteria, to facilitate matching of subjects and to decrease the number of confounding variables.

The choice of one local hospital rather than several hospitals was made after considering the advantages and disadvantages. Consistency in the philosophy and delivery of obstetrical care is best controlled by using a single clinical

setting with an established and clearly defined approach to prenatal management. Procedural consistency is also better maintained since all subjects deal with the same receptionists and nurses and are interviewed in the same physical surroundings. It was also necessary to control for the location of prenatal care at the time of first pregnancy - an inclusion requirement for the multigravidas - and this was most reliably accomplished by confining the study to one setting. A disadvantage is that findings may be less readily generalized. McMaster Medical Centre is a teaching hospital located in a mainly middle-to upper-middle class area. The obstetricians' emphasis on minimal medical intervention and (where possible) free choice in method of delivery means that McMaster draws upon and attracts women who are relatively well-educated and well-informed about recent trends in prenatal care and childbirth.

The remaining selection criteria (Criteria 3-7) were adopted to control for other possible confounding influences: age, pregnancy risk, psychiatric history, marital status, ability to communicate with the investigator.

The additional criteria for the main sample multigravidas established similarity between comparison groups on some of the important variables which could not be controlled in the cross-sectional design.

2.2.4 Selection Criteria for the Loss Sample

Multigravidas with a history of stillbirth or neonatal

death are automatically categorized "at risk" in a subsequent pregnancy. Therefore, the loss subjects did not meet by definition Criterion 7 for the pregnancy under study. They did fulfill all other current pregnancy selection criteria. Because subjects with a previous history of loss were found to be relatively scarce, no attempt was made to have them meet the selection criteria applied to the time of their first pregnancy.

The comparison group for the loss sample was selected from multigravidas of the main sample and therefore automatically fulfilled all of the main sample selection criteria.

2.3 Subject Selection

Subject selection, including refusals, drop-outs and eliminations, will be described first for the main sample and then for the loss sample. Table 8 summarizes these data.

2.3.1 Subject Selection for the Main Sample

Subjects for the main sample were selected from all of the low risk antenatal clinics in the Department of Obstetrics and Gynaecology at McMaster Medical Centre in Hamilton, Ontario. This included six to eight clinics run by two obstetricians. Selection took place between January, 1983 and October, 1984 inclusive. A total of one hundred and eleven patients were asked to participate in the study. One hundred patients agreed.

2.3.2 Main Sample Refusals

Eleven subjects (10%) refused participation. Five of the eleven were primigravidas and six were multigravidas. The mean age and median socioeconomic level of this group compared to subjects in the main sample is given in Table 9. Primigravida refusals tended to be somewhat older and from higher socioeconomic levels than those who participated. Statistical analysis of mean differences was not done because of the inequality in sample sizes and in variation.

Two of the eleven refusals had clearly stated objections. One primigravida was concerned about the topic, asked a lot of questions and then declined. The other, a multigravida, said that she had been involved in too many studies in her first pregnancy. Nine of the eleven expressed interest but declined because of lack of time, other appointments, or not wanting to inconvenience a companion. Several offered to stay following their next appointment but this put them outside the 18-22 weeks pregnancy range required for selection.

2.3.3 Main Sample Drop-outs

Of the one hundred women who agreed to participate in the study, there were five drop-outs (5%). Three were primigravidas. One had a miscarriage between the early and the late pregnancy interviews. Another lived out of town, was under shared obstetrical care and did not have an antenatal visit scheduled during the 30-34 weeks pregnancy period. The third worked full

time and was moving house during late pregnancy and attempts to work out a suitable meeting time failed. One multigravida dropped out after the second interview claiming that her husband did not approve of the questions concerning their marriage. The other multigravida was an English-speaking Chinese woman whose non-English speaking family were unable to understand my telephone messages.

2.3.4 Main Sample Eliminations

Five subjects (5%) were eliminated from the study. One subject, a primigravida, was eliminated because she had a twin pregnancy. One multigravida was eliminated because her child was present during the early pregnancy interview. Three subjects were dropped from the study because they could not be matched.

2.3.5 Subject Selection for the Loss Sample

The loss subjects were selected from four high risk clinics run by two obstetricians at McMaster Medical Centre. The time span for selection was the same as for the main sample. A total of fourteen patients were approached. Twelve agreed to participate (see Table 8). Twelve multigravidas from the main sample were used as the comparison group for these subjects.

Table 8 Summary of subject selection with refusals, drop-outs and eliminations.

| | <u>Total</u> | <u>Main Sample</u> | | | <u>Loss Sample</u> | |
|-------------------------|--------------|--------------------|----------|--|--------------------|-----------------|
| | | <u>P</u> | <u>M</u> | | <u>Loss</u> | <u>Subjects</u> |
| Participation requested | 111 | 56 | 55 | | 14 | |
| Refusals | 11 | 5 | 6 | | 2 | |
| Drop-outs | 5 | 3 | 2 | | 0 | |
| Eliminations | 5 | 3 | 2 | | 0 | |
| Final Sample | 90 | 45 | 45 | | 12 | |

P=Primigravidas, M=Multigravidas

Table 2 Mean age and socioeconomic status for main sample and refusals.

| | <u>Primigravidas</u> | | <u>Multigravidas</u> | |
|--|-------------------------|--------------------------|-------------------------|--------------------------|
| | <u>sample</u> (n=45) | <u>refusals</u> (n=5) | <u>sample</u> (n=45) | <u>refusals</u> (n=6) |
| <u>Mean age</u> (in years) | 27.38 | 29.80 | 28.18 | 27.00 |
| <u>Standard deviation</u> | 3.36 | 3.90 | 3.26 | 3.52 |
| <u>Median socio-economic</u> <u>level</u> (Blisshen & McRoberts, 1976) | 3.04 | 1.00 | 3.29 | 4.50 |

2.3.6 Loss Sample Refusals

Of the fourteen patients who were asked to participate, two declined (14%). One subject was very upset about being asked, saying that she had told her story too many times to too many people. The other subject initially agreed but then changed her mind before meeting the investigator. Refusals among the twelve comparison multigravidas was not an issue because these subjects were chosen from the main sample subjects.

2.3.7 Loss Sample Drop-outs and Eliminations

The twelve loss subjects who agreed to participate remained in the study to completion i.e., there were no drop-outs and no eliminations. Six main sample multigravidas were eliminated as prospective comparison subjects because of histories of at risk first pregnancies. Once the comparison group had been chosen, there were no drop-outs or eliminations.

2.4 Matching

Age and socioeconomic status may have a confounding influence upon the principal variables examined in the study. Accordingly the main groups were matched for:

- a) age: + or - 2 years
- b) socioeconomic status: + or - 1 level (Blishen, 1967; Blishen & McRoberts, 1976)

Matching began when approximately forty subjects for each group had completed their first interview (the early pregnancy interview). Consecutive selection continued until forty-five

matched pairs were obtained.

Matches were made between the ages of subjects at the time of the early pregnancy interview. The spouse (or partner) with the highest income at the time of the early pregnancy interview was used to place subjects in one of the following six socioeconomic levels:

| <u>Level</u> | <u>Income in Thousands of Dollars</u> |
|--------------|---------------------------------------|
| Level 1 | 70 + |
| Level 2 | 60.00 - 69.99 |
| Level 3 | 50.00 - 59.99 |
| Level 4 | 40.00 - 49.99 |
| Level 5 | 30.00 - 39.99 |
| Level 6 | Below 30 |

The six levels, expressed in income, are based on three variables: (1) income associated with occupations of the Canadian male labour force in 1971 (2) the educational level associated with these occupations and (3) a corresponding prestige level (Blishen, 1967; Blishen & McRoberts, 1976).

Three subjects were excluded because a partner was not available. Two of these were young primigravidas (20-22 yrs.) from upper socioeconomic levels (Level 1) and one was an older multigravida (age 34) from a lower socioeconomic level (Level 6).

Using the same criteria, the twelve subjects with previous loss were individually matched for age and socioeconomic status to twelve multigravidas from the main sample.

2.5 The Final Sample

The final sample consisted of:

1) The main sample

45 women in a first pregnancy (primigravidas) ,

45 women in a second pregnancy (multigravidas)

These two groups were used to compare first and second pregnancies (Hypotheses 1 and 2) and examine change in attachment (Hypotheses 3).

2) The loss sample

12 women in a second pregnancy who had lost their first baby by stillbirth or neonatal death.

12 women in a second pregnancy who had successfully completed a first pregnancy. These subjects were selected from the main sample multigravidas.

These two groups were used to examine maternal attachment in women who had previously lost a baby (Hypotheses 4, 5 and 6).

The characteristics of the main sample will be described first followed by a description of the loss sample. The descriptive variables are age, socio-economic status, length of marriage and number of weeks pregnant at the first and the second interviews. The primigravidas will also be compared to the multigravidas for age, socioeconomic status and length of marriage for the time of each group's first pregnancy i.e., this pregnancy for the primigravidas with last pregnancy for the multigravidas.

2.5.1 Characteristics of the Main Sample

Once enlisted, the subjects appeared to enjoy the study and were usually pleased when the time came to arrange the second interview. During the interviews they were for the most part, co-operative and frank in expressing themselves.

1) Age and Socioeconomic Status

The age and socioeconomic status of the main sample are given in Table 10. A ~~t-test~~ for related groups was done as a check for the match that had been done for age. Although subjects had been individually matched within + or - 2 years, the multigravidas as a group were significantly older than the primigravidas as a group ($t = 4.64$, $44df$, $p < .001$). The match for age therefore succeeded in controlling for the influence of large age differences within pairs but did not eliminate significant group differences. Similarly, the match carried out for socioeconomic status revealed a significant difference between the two groups. Although each pair had been matched to within + one - 1 socioeconomic level, the primigravidas as a group were found to be consistently higher in socioeconomic status ($z = 2.05$, $p = .04$).

2) Length of Marriage

The multigravidas had been married significantly longer than the primigravidas at the time of the study ($t = 4.64$, $44df$, $p < .001$) (see Table 11).

Table 10 Age and socioeconomic status of the main sample

| | <u>Primigravidas</u> | <u>Multi-gravidas</u> | <u>Total</u> |
|-----------------------|----------------------|-----------------------|--------------|
| <u>Sample Size</u> | 45 | 45 | 90 |
| <u>Age (in years)</u> | | | |
| 20-24 | 9 | 7 | 16 |
| 25-29 | 24 | 22 | 46 |
| 30-35 | 12 | 16 | 28 |
| Mean age | 27.38 | 28.18 | 27.78 |
| Median age | 28.00 | 28.57 | 28.33 |
| Standard deviation | 3.36 | 3.26 | 3.32 |

Socioeconomic Status (Blisshen & McRoberts, 1976)

| | | | | |
|--------------------|---------------|------|------|---------------|
| <u>Level</u> | | | | |
| 1 | 70 + | 6 | 6 | 12 |
| 2 | 60.00 - 69.99 | 10 | 7 | 17 |
| 3 | 50.00 - 59.99 | 12 | 12 | 24 |
| 4 | 40.00 - 49.99 | 7 | 6 | 13 |
| 5 | 30.00 - 39.99 | 6 | 11 | 17 |
| 6 | Below 30 | 4 | 3 | 7 |
| Mean SES | | 3.2 | 3.4 | 3.3 |
| Median SES | | 3.04 | 3.29 | 3.17 |
| Standard deviation | | 1.5 | 1.51 | 1.5 |

Table 11 The main sample: length of marriage

| <u>Years married</u> | <u>Primigravidas</u> | <u>Multi-gravidas</u> | <u>Total</u> |
|----------------------|----------------------|-----------------------|--------------|
| 1-2 yrs. | 14 | 3 | 17 |
| 3-4 yrs. | 17 | 10 | 27 |
| 5-6 yrs | 8 | 15 | 23 |
| 7-8 yrs. | 5 | 7 | 12 |
| 9-10 yrs. | 1 | 5 | 6 |
| 11-12 yrs. | 0 | 2 | 2 |
| 13-14 yrs. | 0 | 3 | 3 |
| <u>Total n</u> | 45 | 45 | 90 |

3) Number of Weeks Pregnant

The 18-22 weeks pregnancy range was specified as one of the selection criteria for the study. Table 12 gives the distribution of primigravidas and multigravidas within this range at the time of the early pregnancy interview. Differences between groups were not significant ($z = .32$, $p = .74$).

Table 13 shows the breakdown of the number of weeks pregnancy at the time of the late pregnancy interview. All subjects were between 30-34 weeks pregnant. Differences between groups were not significant ($z = .18$, $p = .86$).

2.5.2 Comparisons of the Main Sample with Other Samples

Table 14 gives comparisons for the age of the main sample with the ages of women giving birth to live babies in Ontario in 1982 (Ontario Statistics, 1982) and in Canada in 1983 (Statistics Canada, 1983). The populations are not directly comparable; the main sample in my research consists of pregnant women whereas the Ontario and Canadian groups are women who have given birth. The Ontario sample consists of all live births whereas my population and the Canadian populations are married women only. The government statistics provide information for women only up to 34 years of age whereas the research sample contained one subject who was 35 years old. This subject was eliminated from these comparisons. Inspection of the distributions indicated that my research subjects tended to be older than women in both the Ontario and the Canadian populations.

Table 12 The main sample: number of weeks pregnant
at the early pregnancy interview

| <u>Weeks pregnant</u> | <u>Primigravidas</u> | <u>Multigravidas</u> | <u>Total</u> |
|-----------------------|----------------------|----------------------|--------------|
| 18-18 6/7 | 14 | 12 | 26 |
| 19-19 6/7 | 3 | 9 | 12 |
| 20-20 6/7 | 9 | 9 | 18 |
| 21-22 | 19 | 15 | 34 |
| <u>Total n</u> | 45 | 45 | 90 |

Table 13 The main sample: number of weeks pregnant
at the late pregnancy interview

| <u>Weeks pregnant</u> | <u>Primigravidas</u> | <u>Multigravidas</u> | <u>Total</u> |
|-----------------------|----------------------|----------------------|--------------|
| 30-30 6/7 | 10 | 6 | 16 |
| 31-31 6/7 | 6 | 12 | 18 |
| 32-32 6/7 | 10 | 7 | 17 |
| 33-34 | 19 | 20 | 39 |
| <u>Total n</u> | 45 | 45 | 90 |

Table 14 Age of the main sample subjects compared to the percentage of live births by age of mothers in Ontario, 1982 and Canada, 1983

| <u>Age</u> | <u>Age of</u> <u>Main sample</u> | <u>% live births</u> <u>in Ontario, 1982</u> | <u>% live births</u> <u>in Canada, 1983</u> |
|----------------|-------------------------------------|---|--|
| 20-24 | 18% | 33% | 30% |
| 25-29 | 51% | 43% | 46% |
| 30-34 | 30% | 24% | 24% |
| <u>Total n</u> | 89 | .108,176 | 278,199 |

Table 15 compares the median age of the main sample groups with the median age of mothers giving birth to first or second children in Canada in 1983 (Statistics Canada, 1985). Again, it appears that the subjects for this research are somewhat older than Ontario women giving birth to first and to second babies.

2.5.3 Age, Socioeconomic Status and Length of Marriage at Time of First Pregnancy

The current age of the primigravidas was compared with the age of the multigravidas when they were first pregnant. Because the subjects were matched for current pregnancy comparisons it is not surprising that the primigravidas (this pregnancy) were found to be significantly older than the multigravidas were at the time of their first pregnancy. The mean age of the primigravidas was 27.38 years and the mean age of the multigravidas when first pregnant was 25.62 years. This difference was highly significant ($t = 8.51, 44df, p < .001$).

The primigravidas were also of a higher socioeconomic class than the multigravidas when first pregnant. The difference between means was not large - mean socioeconomic level of the primigravidas was 3.2 and of the multigravidas was 3.4 - but the difference was statistically significant because the primigravidas were consistently of a somewhat higher socioeconomic status than the multigravidas ($z = 2.20, p = .03$).

The difference between the two groups in length of marriage at the time of their first pregnancy was not significant ($t = .23, 44df, p = .82$).

Table 15 Comparison of the median age of the main sample primigravidas and multigravidas with the age of mothers giving birth to first or second children in Canada, 1983

| | <u>Median age (in years)</u> |
|----------------------------------|------------------------------|
| <u>Main sample primigravidas</u> | <u>28.60</u> |
| <u>First births in Canada</u> | 24.60 |
| <u>Main sample multigravidas</u> | 28.57 |
| <u>Second births in Canada</u> | 27.10 |

2.5.4 Summary of Main Sample Characteristics

Although the two groups were individually matched for both age and socioeconomic status, a statistical analysis of the group differences revealed that the primigravidas as a group were significantly younger and significantly higher in socioeconomic status than the multigravidas as a group. For both of these variables, the differences were not due to large differences within pairs, but when differences existed, they were consistently in one direction. Statistical analysis also showed that the multigravidas had been married significantly longer, and that at the time of their first pregnancy, they were younger and of a lower socioeconomic status than the primigravidas.

The fact that the subjects were matched to control for the influence of age and socioeconomic status had the effect of creating other biases in the sample. The primigravidas in this research, although somewhat younger than the multigravidas are nevertheless older and economically more advantaged than is usual for women in a first pregnancy. They are more likely to have married at a later age and probably more likely to have established themselves in a career. If matching had been done more exactly than it was, e.g., so that the multigravidas as a group were not consistently slightly older than the primigravidas, these secondary biases would have been even more pronounced. The groups thus obtained would have been matched to the point of artificiality, i.e., women can never have a second baby at the same time or earlier than a first baby.

The overall effect of the matching and controls upon the final sample was to achieve a compromise. The confounding influence of age and SES upon the main variables, if it exists, is likely to be slight because the difference within each pair is never great. Yet when present, these differences bring the groups closer to the differences that would ordinarily accompany first and second pregnancies.

2.5.5 Characteristics of the Loss Sample

The interviews were difficult for the loss subjects. Most of the women expressed apprehension before the interview and were at one point or another in tears during the interview. For this reason, they were given plenty of time to answer questions and the latitude not to answer if they so chose. They also relied on various other means of dealing with their feelings; for example, one subject wished to stand and walk about while answering questions because "it made her feel stronger".

Five subjects gave birth to stillborn babies and seven to babies who died during the neonatal period. Four infants died as a result of genetic defects (trisomy, growth retardation, dwarfism). One infant died as a result of cord strangulation, one from respiratory distress in the neonatal period, one from fetal distress and one from calcification of the placenta in an overdue pregnancy. Two infants had liver defects, one mother suffered from severe toxemia with convulsions and the cause of death for one stillbirth was not determined.

The length of time between the first and the second pregnancy for the loss subjects ranged from 4 to 24 months with a mean of 10.79 months. The length of time between the first and the second pregnancy for the comparison multigravidas ranged from 11 to 55 months with a mean of 28.91 months. The difference between groups was statistically significant ($t = 3.32$, 11df, $p = .007$).

1) Age and Socioeconomic Status

The age and socio-economic status of the loss sample is given in Table 16. The differences between the two groups in age ($t = .80$, 11df, $p = .44$) and socioeconomic status ($z = 1.00$, $p = .32$) were not significant.

2) Weeks Pregnant at Selection

The distribution of loss sample subjects within the 18-22 weeks pregnancy range appears in Table 17. The difference between groups was not significant ($z = .76$, $p = .45$).

3. Variables and Instruments

The variables and instruments for testing the research hypotheses are discussed under the following headings:

- a) The interview and the main variables
- b) The additional variables
- c) The instruments for the additional variables
- d) The variables and the instruments for the loss sample

Table 16 Age and socioeconomic status of the loss sample

| | <u>Comparison</u> | | |
|-----------------------|----------------------|----------------------|--------------|
| | <u>Loss Subjects</u> | <u>Multigravidas</u> | <u>Total</u> |
| <u>Sample Size</u> | 12 | 12 | 24 |
| <u>Age (in years)</u> | | | |
| 20-25 | 2 | 3 | 5 |
| 26-30 | 6 | 5 | 11 |
| 31-35 | 4 | 4 | 8 |
| Mean age | 27.75 | 27.58 | 27.67 |
| Median age | 26.20 | 26.17 | 26.25 |
| Standard deviation | 3.79 | 3.50 | 3.57 |

Socioeconomic Status

(Blishen & McRoberts, 1976)

Level

| | | | | |
|---|--------------------|------|------|------|
| 1 | 70+ | 0 | 0 | 0 |
| 2 | 60.00 - 69.99 | 2 | 2 | 4 |
| 3 | 50.00 - 59.99 | 2 | 2 | 4 |
| 4 | 40.00 - 49.99 | 4 | 5 | 9 |
| 5 | 30.00 - 39.99 | 3 | 2 | 5 |
| 6 | Below 30 | 1 | 1 | 2 |
| | | | | |
| | Mean SES | 3.92 | 3.83 | 3.88 |
| | Median SES | 4.00 | 3.90 | 3.94 |
| | Standard deviation | 1.24 | 1.19 | 1.19 |

Table 17 Number of weeks pregnant at selection

| <u>Weeks Pregnant</u> | <u>Loss Subjects</u> | <u>Comparison</u> <u>Multigravidas</u> | <u>Total</u> |
|-----------------------|----------------------|---|--------------|
| 18-18 6/7 | 5 | 2 | 7 |
| 19-19 6/7 | 2 | 3 | 5 |
| 20-20 6/7 | 3 | 4 | 7 |
| 21-22 | 2 | 3 | 5 |
| <u>Total n</u> | <u>n=12</u> | <u>n=12</u> | <u>n=24</u> |

3.1 The Interview and the Main Variables

A semi-structured interview was designed specifically for the research. As described in Chapter 2, the content of the interview was based on: a review of the literature of the assessment of prenatal maternal attitudes; discussion with the obstetrical staff at McMaster Hospital; empirical observation, i.e., the responses from approximately fifty pilot interviews with pregnant women and, the researcher's own ideas.

There were sixteen questions in the interview for the main study. Each question measured one of ten maternal attachment variables. The ten attachment variables were:

Variable 1 - Image of the Baby: degree of clarity and specificity in the perception of the baby's identity. Three interview questions measured:

1. Sex of the Baby
2. Appearance of the Baby
3. Personality of the Baby

Variable 2 - Postnatal Picture: a perception of mother and baby at home together following the birth. Two interview questions measured:

4. Proximity (of mother to baby)
5. Affect (associated with picture)

Variable 3 - Communication with the Baby: the frequency of the communication with the baby. Two interview questions measured:

6. Verbal Communication (talking, singing to the baby)
7. Tactile Communication (touching, stroking abdomen)

Variable 4 - Thoughts about the Baby: the frequency, duration and intensity of thoughts about the baby. Three interview questions measured:

- 8. Frequency of Thoughts
- 9. Duration of Thoughts
- 10. Intensity of Thoughts

Variable 5 - Positive Feeling: degree of positive feeling about the baby. One interview question measured:

- 11. Positive Feeling

Variable 6 - Negative Feeling: degree of negative feeling about the baby. One interview question measured:

- 12. Negative Feeling

Variable 7 - Conflict: degree of conflict about the baby. One interview question measured:

- 13. Conflict

Variable 8 - Anxiety-Health of Baby: degree of anxiety about the physical and/or emotional health of the baby. One interview question measured:

- 14. Anxiety-Health of Baby

Variable 9 - Anxiety-Self as Mother: degree of anxiety about her capacities as a mother. One interview question measured:

- 15. Anxiety-Self as Mother

Variable 10 - Global Score: the overall balance of positive and negative feeling about the baby. One interview question measured:

- 16. Global Score

The interview questions appear in Appendix B. Definitions of each measure with scoring instructions appear in Appendix D. Categories for questions 1-4 and questions 6-15 have underlying continuums. Categories for questions 5 and 16 are treated as

discrete when the category "neutral" is included in the data analysis and as continuous (involving various degrees of positive feeling) when the category "neutral" is excluded.

3.2 The Additional Variables

There were twelve additional variables in the research:

1. Quickening: has the subject felt movement?
2. Ultrasound: has the subject received ultrasound?
3. Planned Pregnancy: was the pregnancy planned or unplanned?
4. Difficulty Conceiving: was there any difficulty conceiving?
5. Complications of Pregnancy: were there any physical complications of pregnancy?
6. Support from Spouse: degree of emotional support from spouse during the course of pregnancy.
7. Support from Others: degree of emotional support from others (family, friends) during the course of pregnancy.
8. Stress during Pregnancy: the occurrence of stressful life events during the course of pregnancy.
9. Length of Marriage: how long has the subject been married?
10. Maternal Education: highest educational level achieved.
11. Employment: is the subject working?
12. Postnatal Employment Plans: does the subject plan to work during the first postnatal year?

The additional variables were included to describe the sample and to obtain data about factors known or thought to be related to prenatal attachment. If the two groups, primigravidas and multigravidas, were not significantly different for these measures, they could then be treated as controlling variables. If significant differences were found, the extent of their confounding influence upon the main variables would be determined later.

3.2.1 Additional Variables for the Multigravidas

Measures for all of the above additional variables (except Quickening) were obtained for the multigravidas for the time of their first pregnancy. This was done to check for possible confounds associated with the cross-sectional design (see Section 2.2.2).

3.2.2 Age and Socioeconomic Status

The influence of age and socio-economic status, controlled for the main analyses, was later examined by subdividing the sample on these variables.

3.3 The Instruments for the Additional Variables:

Measures for some of the additional variables were obtained by semi-structured interview questions at the beginning of the early pregnancy interview, others by questions at the beginning or end of the late pregnancy interview. The remaining

variables were in the form of a short self-administered questionnaire following the late pregnancy interview. The method of administration (interview or questionnaire) and the placement of items was determined by the content of each question. The intention was to maintain a natural order to the material in the interview. For example, questions about quickening and difficulty conceiving were placed at the beginning of the early pregnancy interview whereas questions about perceived support and stress during pregnancy were placed at the end of the late pregnancy interview. The scoring criteria for the additional interview and the questionnaire items appear in Appendix E.

3.4 The Variables and the Instruments for the Loss Sample

The main variables for the loss sample were the same attachment measures used for the main sample. However, there was a difference in the number of additional variables for loss sample. Apart from the circumstances surrounding the death of their infants, data concerning the first pregnancy was omitted because of the subjects' sensitivity to this topic. The self-administered questionnaire was also omitted.

4. Procedure

The procedure for the main sample will be described first, followed by a description of the procedure for the loss sample.

4.1 Procedure for the Main Sample

Step 1: Staff Orientation

Before beginning data collection, the investigator met with the charge nurse of each clinic to describe the study and her role in the recruitment of subjects.

Step 2: Subject Selection

Clinic charts were examined one day before each antenatal clinic and women who fulfilled the selection criteria were consecutively chosen. Consecutive selection was occasionally impossible because of back to back appointment times of two or more potential subjects. When this occurred, the subject with the earlier appointment time was chosen. When appointment times of late pregnancy subjects overlapped with those of new recruits, priority was given to the late pregnancy subjects.

Step 3: Obtaining Consent

Obtaining consent was a two stage process. Initial consent was obtained by the charge nurse immediately preceding the patient's antenatal examination. The patient was asked whether she would be willing to participate in a study about "women's thoughts and feelings about their expected babies". If she agreed, she was introduced to the investigator by the charge nurse following the antenatal examination. The second stage of the consent process took place in the interviewing room. The study was described, questions were answered and formal consent was obtained (see Appendix A). It was agreed that a second interview would follow a regular clinic appointment between 30-34

weeks pregnancy and that the investigator would contact the subject by telephone approximately one week before this visit.

Step 4: Interview Procedure

The early pregnancy interview took place immediately after obtaining formal consent. Subjects were seen individually. Sometimes this meant excluding a spouse, relative or younger child. Occasionally baby-sitting had to be arranged. In one or two cases, the subject was seen with her younger child present. Those subjects were later eliminated from the study.

For the late pregnancy interview, questions were repeated using the same format as for the first interview. Differences in procedure between the early and late interviews had to do with the inclusion of questions for the additional variables.

4.2 Procedure for the Loss Sample

The procedure for the loss sample was identical to that for the main sample with two exceptions:

- 1) four out of twelve subjects had their spouses accompany them to the antenatal visits. In every case, the woman and her spouse made his presence in the interview a condition of participation in the study.

- 2) certain of the additional variables and the questionnaire were omitted from the assessment.

5. Reliability

A research assistant was trained to do the interview and

use the scoring criteria. She observed and independently scored a total of twenty-four interviews. This was done from a position which acknowledged her presence but obscured the investigator's scoring from view. Following each interview, the investigator and assistant discussed the interview and scoring decisions.

5.1 General Procedure

Formal procedures began when the investigator and assistant agreed that a sufficient level of mastery in interviewing and scoring had been attained. At this point, all discussion about procedure and scoring ceased.

It was not possible to ensure rater blindness with respect to the subjects' groups because this was apparent from their responses early on in the interview. However, the assistant was blind concerning the predictions of the study.

Data for all measures of agreement were collected during the first six months of the data collection for the main study. Both primigravidas and multigravidas plus early and late pregnancy subjects were represented in the sample.

Subjects were chosen consecutively, partly from the research sample and partly from clinic patients who fit the selection criteria other than that they were too late in pregnancy (30-34 weeks) to be included in the main study. Subjects were asked if they would be willing to assist in training an assistant for the research. Assignment of subjects to particular groups was determined by the availability of one or

both interviewers plus the feasibility of the various procedures for each subject. No subject participated in more than one group.

5.2. Data Analysis

When variables called for a single response, percentage agreement was used as the measure of agreement. When there were two or more response categories, Kappa (Cohen, 1960; Fleiss, 1973) or weighted Kappa (Cohen, 1968; Fleiss, 1973) were used.

Kappa and weighted Kappa (k) have properties which are especially suited to the type of ratings used in this research. They were developed as measures of agreement for categorical data and take into account the number of agreements expected by chance. Weighted Kappa measures the relative seriousness of each disagreement whereas Kappa acknowledges only the presence or absence of exact agreement. In this research, weighted Kappa was used when ordinal scales contained three or more continuous categories (Cicchetti, 1976). A criterion of $k \geq .50$ was adopted.

5.3 Reliability of the Main Variables

The reliability of the sixteen main interview items (the attachment measures) was analysed as follows:

- a) Inter-rater reliability
- b) Long-term intra-rater reliability
- c) Intra-interviewer reliability
- d) Inter-interviewer reliability

5.3.1 Inter-rater Reliability

Twelve subjects were interviewed and independently scored by two raters. One-half of the subjects were interviewed by the investigator and the other half by the research assistant. In both cases the second rater was present in the interviewing room. Subjects were also divided according to whether they were primigravidas or multigravidas and whether they were in early or late pregnancy. Because early pregnancy subjects were also to become a part of the main sample, the investigator conducted all early pregnancy interviews. A classification of this system is given in Table 18.⁴ Out of a total of sixteen interview items, kappa values ranged from $k=.52$ to $k=1$ with a mean of $.79$ (Table 19). One item, Conflict ($k=.52$) was considerably lower than the rest but still within criterion level of $.50$.

5.3.2 Long-term Intra-rater Reliability

Since subjects were seen first in early pregnancy and then in late pregnancy, a measure of long-term stability of scoring was desirable. The interviews of twelve subjects were tape recorded, coded to maximize anonymity and put aside for three months. A repeat scoring was then carried out from these tape recorded interviews. Subjects were divided according to stage of pregnancy and gravidity (Table 20). Out of sixteen items, kappa values ranged from $k=.73$ to $k=1$ with a mean of $.90$ (Table 21). Stability of performance of a single interviewer over time appears to be highly reliable using these measures.

Table 18 Classification of subjects according to
gravity, stage of pregnancy and interviewer
for inter-rater reliability

| <u>Subjects (n=12)</u> | <u>n per group</u> | <u>Interviewer</u> |
|------------------------|--------------------|--------------------|
| early P | 2 | investigator |
| early M | 3 | investigator |
| late P | 4 | assistant |
| late M | 3 | assistant |

P=primigravidas, M=multigravidas

Table 19 Inter-rater reliability for the main interview measures

| <u>Interview measure</u> | <u>Kappa (n=12)</u> |
|----------------------------------|---------------------|
| 1. Sex of the Baby | 1.00 |
| 2. Appearance of the Baby | .79 |
| 3. Personality of the Baby | .84 |
| 4. Proximity (Postnatal Picture) | .72* |
| 5. Affect (Postnatal Picture) | .64* |
| 6. Verbal Communication | .91 |
| 7. Tactile Communication | .84 |
| 8. Frequency of Thoughts | .75 |
| 9. Duration of Thoughts | .89 |
| 10. Intensity of Thoughts | .82 |
| 11. Positive Feeling | .73 |
| 12. Negative Feeling | .75 |
| 13. Conflict | .52 |
| 14. Anxiety-Health of Baby | .86 |
| 15. Anxiety-Self as Mother | .79 |
| 16. Global Score | .86* |

Mean=.79

* unweighted Kappa, all others are weighted Kappa

Table 20 Classification of subjects according to gravidity and stage of pregnancy for long-term intra-rater reliability

| <u>Subjects (n=12)</u> | <u>n per group</u> |
|------------------------|--------------------|
| early P | 2 |
| early M | 3 |
| late P | 2 |
| late M | 5 |

P=primigravida, M=multigravida

Table 21 Long-term intra-rater reliability for
the main interview measures

| <u>Interview measure</u> | <u>Kappa (n=12)</u> |
|----------------------------------|---------------------|
| 1. Sex of the Baby | .77 |
| 2. Appearance of the Baby | .83 |
| 3. Personality of the Baby | .81 |
| 4. Proximity (Postnatal Picture) | 1.00* |
| 5. Affect (Postnatal Picture) | 1.00* |
| 6. Verbal Communication | 1.00 |
| 7. Tactile Communication | 1.00 |
| 8. Frequency of Thoughts | .94 |
| 9. Duration of Thoughts | .94 |
| 10. Intensity of Thoughts | .86 |
| 11. Positive Feeling | 1.00 |
| 12. Negative Feeling | .85 |
| 13. Conflict | .94 |
| 14. Anxiety-Welfare of Baby | 1.00 |
| 15. Anxiety-Self as Mother | .80 |
| 16. Global Score | .73* |

Mean=.90

* unweighted kappa, all others are weighted kappa

5.3.3 Intra-interviewer Reliability

In order to test for the reproducibility of subjects' responses, the investigator interviewed ten subjects on two separate occasions. A short-term (5-7 days) rather than long-term measure was chosen to minimize change associated with different stages of pregnancy. The first interview took place in the interviewing room and the second in the subject's home. It was recognized that reproducibility would have best been measured by using the same location for both interviews. However, this was possible for some subjects but not others. Doing all second interviews in the subjects' homes at least ensured that the procedure was the same for all subjects.

All ten subjects were in late pregnancy. Four subjects were primigravidas and six were multigravidas (Table 22).

Values of kappa for the sixteen interview items ranged from $k=.58$ to $k=1$ with a mean of $.77$ (Table 23). Two items were relatively low but still within acceptable limits. One was the Global Score ($k=.58$) and the other was Negative Feeling ($k=.59$).

5.4.4 Inter-interviewer Reliability

To demonstrate that measures were independent of the interviewer as well as repeatable, subjects were interviewed on two separate occasions by different interviewers. Two separate series were completed. The first consisted of twelve subjects and the second of sixteen subjects. The second series was done to try to improve agreement for four problematic interview items.

Table 22 Classification of subjects according to gravidity
for intra-interviewer reliability

| <u>Subjects (n=10)</u> | <u>n per group</u> |
|------------------------|--------------------|
| late P | 4 |
| late M | 6 |

P=primigravida, M=multigravida

Table 23 Intra-interviewer reliability for
the main interview measures

| <u>Interview measure</u> | <u>Kappa (n=12)</u> |
|----------------------------------|---------------------|
| 1. Sex of the Baby | .74 |
| 2. Appearance of the Baby | .74 |
| 3. Personality of the Baby | 1.00 |
| 4. Proximity (Postnatal Picture) | 1.00* |
| 5. Affect (Postnatal Picture) | .75* |
| 6. Verbal Communication | .81 |
| 7. Tactile Communication | .76 |
| 8. Frequency of Thoughts | .83 |
| 9. Duration of Thoughts | .72 |
| 10. Intensity of Thoughts | .90 |
| 11. Positive Feeling | .78 |
| 12. Negative Feeling | .59 |
| 13. Conflict | .69 |
| 14. Anxiety-Welfare of Baby | .69 |
| 15. Anxiety-Self as Mother | .79 |
| 16. Global Score | .58* |

Mean=.77

* unweighted Kappa, all others are weighted Kappa

This was preceded by a second period of training in which problem areas were identified and points of interpretation and scoring clarified. Procedures for both series were identical. As in the intra-interviewer reliability, a period of five to seven days separated the two interviews. The first interview took place at McMaster Medical Centre, the second in the subject's home. Early and late pregnancy subjects plus primigravidas and multigravidas were represented in both samples (Table 24). In order to control for possible bias associated with the order of interviewers, one-half of the first interviews were done by the investigator, the other half by the research assistant. The investigator did all first interviews with women who were subjects for the study.

Kappa values for both series (see Table 25) were on the whole lower than those for inter-rater reliability and for intra-interviewer reliability.

In the first series ($n=12$), Kappa ranged from $k=.42$ to $k=.87$ with a mean of $.65$. There were three items that did not meet criterion level:

- 1) Frequency of Thoughts ($k=.49$)
- 2) Conflict ($k=.44$)
- 3) Anxiety-Welfare of Baby ($k=.42$)

A fourth item, Appearance of the Baby, only just reached criterion ($k=.50$).

Kappa values for the second series ($n=16$) ranged from $k=.36$ to $k=.89$ with a mean of $.65$. Reliabilities for three out of the four problematic items improved in the second series, whereas

reliability of the fourth item, Conflict, decreased ($K=.36$). However, because the research design used the same interviewer for both early and late pregnancy interviews and intra-interviewer reliability had yielded a satisfactory result, it was decided to retain this item. Values for some of the non-problematic items increased while others decreased but all remained above criterion level of .50 (Table 25).

5.4 Reliability of the Additional Variables

5.4.1 Additional Interview Variables

Three sets of additional interview items were given at different stages of the assessment. Because some of these items were designed for multigravidas only, others for early multigravidas only, and still others for late gravidas only, sample sizes for certain variables were considerably reduced. In some cases, statistical analysis was not carried out. This occurred only for retrospective variables related to time of first pregnancy for the multigravida subjects. Small sample size was also a problem for inter-interviewer reliability for several of the additional variables (e.g., perceived support and stress during pregnancy). This problem was dealt with by pooling subjects from the first series and the second series. This was considered justifiable because these items were not subject to discussion during the second training period i.e., content and procedure were identical. Where sample sizes still remained

Table 24 Classification of two groups of subjects
according to gravidity and stage of pregnancy
for inter-interviewer reliability

| <u>Subjects</u> | <u>Series 1 (n=12)</u> | <u>Series 2 (n=16)</u> |
|-----------------|------------------------|------------------------|
| early P | 4 | 3 |
| early M | 2 | 3 |
| late P | 3 | 5 |
| late M | 3 | 5 |

P=primigravida, M=multigravida

Table 25 Inter-interviewer reliability for the main interview measures

| <u>Interview measures</u> | <u>Kappa</u> | |
|----------------------------------|---------------------------|---------------------------|
| | <u>Series 1</u> (n=12) | <u>Series 2</u> (n=16) |
| 1. Sex of the Baby | .82 | .79 |
| 2. Appearance of the Baby | .50 | .65 |
| 3. Personality of the Baby | .65 | .57 |
| 4. Proximity (Postnatal Picture) | .87* | .72* |
| 5. Affect (Postnatal Picture) | .76* | .64** |
| 6. Verbal Communication | .80 | .89 |
| 7. Tactile Communication | .64 | .65 |
| 8. Frequency of Thoughts | .49 | .61 |
| 9. Duration of Thoughts | .59 | .59 |
| 10. Intensity of Thoughts | .86 | .71 |
| 11. Positive Feeling | .79 | .65 |
| 12. Negative Feeling | .56 | .61 |
| 13. Conflict | .44 | .36 |
| 14. Anxiety-Welfare of Baby | .42 | .63 |
| 15. Anxiety-Self as Mother | .63 | .62 |
| 16. Global Score | .62* | .64* |
| | <u>Mean=.65</u> | <u>Mean=.65</u> |

* unweighted kappa, all others are weighted kappa

small ($n < 10$), caution was exercised in interpreting the results.

The sets of additional interview items were as follows:

Set 1: five questions administered to all subjects prior to the main interview items at the early pregnancy interview.

Perfect agreement (100% or $k=1$) was obtained for three of the five variables for both inter-rater and inter-interviewer reliability. The range of values for inter-rater reliability was $k=.62$ to $k=1$ with a mean of .90 and for inter-interviewer reliability was $k=.62$ to $k=1$ with a mean of .85 (Table 26).

Set 2: five questions administered to the multigravidas prior to the main interview items at the early pregnancy interview. Because of a very small sample size ($n=3$), inter-rater reliability was not calculated for any of these variables. The values for inter-interviewer reliability ranged from $k=.62$ to $k=1$ with a mean of .87 (Table 27).

Set 3: three questions which followed the main interview items at the late pregnancy interview. For inter-rater reliability, values ranged from $k=.70$ to $k=1$ with a mean of .85 and for inter-interviewer reliability from $k=.78$ to $k=1$ with a mean of .89 (Table 28).

Reliabilities for these items were also obtained for the late multigravidas ($n=8$) for the time of their first pregnancy. The values for inter-interviewer reliability ranged from $k=.60$ to $k=.84$ with a mean of .76. Sample size for inter-rater reliability ($n=3$) was too small to permit analysis.

5.4.2 Questionnaire Items: Test-retest Reliability

Test-retest reliability was estimated for the six items of the self-administered questionnaire. Included were all late pregnancy subjects from the intra-interviewer reliability group (n=6) and the first inter-interviewer reliability series (n=10). The questionnaire was completed on two occasions following late pregnancy interviews (5-7 days apart). Because of small sample sizes in each of these groups and because there were no content or procedural changes between administrations, responses of the two groups were pooled for analysis (n=16). One group had the same interviewer both times whereas the other group had different interviewers. However, since the questionnaire was self-administered, this difference was not considered influential enough to rule out combining groups.

Perfect agreement (100% or k=1) was obtained for five of the six items (Table 29). The remaining item had a Kappa value of .90.

The above items were also administered to late multigravidas applied to the time of their first pregnancy. Late multigravidas from the intra-interviewer reliability group (n=6) and the first inter-interviewer group (n=3) were combined (n=9). Perfect agreement (100% or k=1) was obtained for all items.

Table 26 Reliabilities for five preliminary interview items: early pregnancy interview, all subjects

| <u>Variable</u> | <u>Inter-rater</u> <u>reliability</u> (n=12) | | <u>Inter-interviewer</u> <u>reliability</u> (n=18) | |
|-----------------------|--|----------|--|----------|
| | <u>%</u> | <u>k</u> | <u>%</u> | <u>k</u> |
| Age | 100% | | 100% | |
| Quickening | | 1.00 | | 1.00 |
| Ultrasound | | 1.00 | | 1.00 |
| Planned Pregnancy | | 1.00 | | .78 |
| Difficulty Conceiving | | .62 | | .62 |
| | <u>Mean k=.90</u> | | <u>Mean k=.85</u> | |

Table 27 Reliabilities for five preliminary interview items: early pregnancy interview, multigravidas only

| <u>Variable</u> | <u>Inter-interviewer reliability</u> (n=8) |
|--|---|
| | <u>k</u> |
| First pregnancy planned | .73 |
| Difficulty conceiving: first pregnancy | .62 |
| Complications of first pregnancy | 1.00 |
| Ultrasound: first pregnancy | 1.00 |
| Complications of delivery | 1.00 |
| | <u>Mean k=.87</u> |

Table 28 Reliabilities for three final interview items:
late pregnancy interview, late gravidas only

| <u>Variable</u> | <u>Inter-rater</u> <u>reliability</u> (n=7) <u>k</u> | <u>Inter-interviewer</u> <u>reliability</u> (n=16) <u>k</u> |
|-------------------------|---|--|
| Support from Spouse | 1.00 | 1.00 |
| Support from Others | .84 | .78 |
| Stress during Pregnancy | .70 | .89 |
| | <u>Mean = .85</u> | <u>Mean = .89</u> |

Table 29 Test-retest reliability for questionnaire items:
late pregnancy interview, late gravidas only

| <u>Variable</u> | <u>Test-retest reliability</u> | | | |
|----------------------------|--------------------------------|----------|------------------------|----------|
| | <u>Current pregnancy</u> | | <u>First pregnancy</u> | |
| | (n=16) | | (n=9) | |
| | <u>%</u> | <u>k</u> | <u>%</u> | <u>k</u> |
| Age | | | 100% | |
| Occupation | 100% | | 100% | |
| Husband's occupation | 100% | | 100% | |
| Length of marriage | 100% | | 100% | |
| Maternal education | | 1.00 | | 1.00 |
| Employment | | 1.00 | | 1.00 |
| Postnatal employment plans | | .90 | | 1.00 |
| | <u>Mean k=.97</u> | | <u>Mean k=1.00</u> | |

6. Validity

Based on a review of the literature of maternal attitudes during pregnancy, a preliminary set of interview items was chosen. Using these items, over fifty pilot interviews were done with obstetrical patients from McMaster Medical Centre antenatal clinics. An open-ended inquiry was also made for attitudes not covered in the initial questions. Each subject was given the opportunity to comment on the relevance and credibility of each question and on the comprehensiveness of the interview. Additions and deletions were based on this information and a final set of items was chosen for a formal pilot study.

Using the method described above, face and content validity were established as thoroughly and as empirically as possible. Since no gold standard for the measurement of prenatal maternal attachment was (or is) available, it was not possible to obtain a measure of concurrent validity. Since current attitudes were being measured rather than future behaviours predicted, predictive validity was not an issue immediately relevant to this research.

7. Data Analysis

The Wilcoxon Matched-Pairs Signed-Ranks Test was used to analyse the attachment variables. This test was chosen because it suited the properties of the design and the data. The Wilcoxon test is a non-parametric procedure for two related samples; it measures the magnitude as well as the direction of

the difference between pairs (Siegel, 1956). The pairs may be natural pairs, i.e., separate measures for the same subjects, or as in this research, matched pairs, where subjects are matched for extraneous variables which could have an influence on the outcome measures.

Consideration was given to using an alternative test: a within-subjects analysis of variance. Analysis of variance is used when measures form at least an interval scale and the data fulfil the assumptions underlying a parametric statistical model. It has been argued that, so long as distributions do not deviate grossly from normality and variances approach equality, analysis of variance can be used with ordinal measures (Gaito, 1980; Edgell & Noon, 1984). There was little similarity among the distributions of the 16 measures in this study and deviations from the normal curve were in many cases pronounced (some distributions were U or J shaped). The results may be misleading when a parametric procedure is used with ordinal data that deviate too far from the requirements of a parametric model because probability values (alpha or Type 1 error) tend to be inflated.

The probability of obtaining significant results by chance alone (Type 1 error) increases in direct proportion to the number of measures tested (Feller, 1968; Abt, 1981). Repeated measurement of a variable has the same effect. Analysis of variance accounts for the probability that findings may be due to error but the Wilcoxon test does not. This research contained 16

measures of attachment, each tested at two stages of pregnancy. The steps taken to deal with this problem are discussed below.

7.1 Testing the Global Hypotheses

If attachment had been measured with a single index score (the sum or average of the 16 measures), only one test of ~~significance~~ would have been required for each of the global hypotheses. The hypotheses for this research were not tested in this way.

In the main sample, Hypothesis 1 (primigravidas will show greater attachment than multigravidas) was tested by analysing the differences between women for 14 measures at early pregnancy and the same 14 measures again at late pregnancy. For Hypothesis 2 (multigravidas will show greater negative feeling and conflict), two variables were examined at each of the two stages of pregnancy. In both cases the global null hypothesis postulates that the difference between groups will not be significant. For Hypothesis 3 (both groups will show an increase in attachment during pregnancy), 16 measures were each tested once (early with late pregnancy measures). In this case, the global null hypothesis postulates no increase in attachment.

In general, the chances of a significant difference occurring by random error at the .05 level is approximately 1/20 ($1/20 = .05$). That is, there is one chance in 20 of falsely rejecting the null hypothesis of no difference between groups. For 14 measures (Hypothesis 1), the chances are .7/14, i.e.,

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significant differences would be expected by chance alone for slightly less than one of 14 tests of significance at each stage of pregnancy.

Consideration was given to checking the reliability of each significant result by running the test a second time on a randomly selected sample from within the total sample. If a significant result is obtained a second time, it is then safer to assume that a true difference between groups exists and that a .05 alpha level reliably reflects this difference. This method works well with very large sample sizes because the statistical power of the test is not too severely affected by reducing the sample size. The sample size in this study ($n=45$ per group) was not large enough to use this procedure.

An alternative solution is to reduce the probability of falsely rejecting the null hypothesis by adopting more stringent criteria of significance. The Bonferroni procedure recommends dividing alpha (.05) by the number of tests (Feller, 1968). Applied to these data, alpha (.05) divided by 14 measures at one stage of pregnancy would yield a corrected alpha of .004, i.e., in order to reject the first global null hypothesis, one measure would have to be significant at $p = .004$. This is generally regarded to be a very conservative estimate (Abt, 1981), applicable where findings are to form the basis for crucial clinical decisions. Where findings are likely to contribute to improvements in clinical management but are not concerned with life or death decisions (as in this research), setting too

stringent levels of significance can result in the loss of potentially useful information.

A procedure better suited to this research (Abt, 1981) is to adjust alpha by specifying a minimum number of variables or locations at which significant differences must occur. This produces a more moderate alpha level but requires significant differences for more than one variable or location. The number of variables or locations is set by the investigator on rational grounds, i.e., what makes sense conceptually and/or how much clinical importance is attached to the findings.

Using this method, a minimum number of significant variables was specified for each of the global hypotheses in the research. To demonstrate true differences between groups for early or for late pregnancy, significant differences were required for 5/14 measures. According to Abt (1981), the null hypothesis of no difference would be rejected if all five measures were significant at a .02 level ($5/14 \times .05 = .02$). Measures for negative feeling and conflict (Hypothesis 2) were treated separately. The recommended alpha for each of these measures would be .03 ($1/2 \times .05 = .03$). To demonstrate a significant increase in attachment (Hypothesis 3), significant differences were required for 6/16 measures. Rejection of the null hypothesis (of no change) would place alpha at .02 for each of these 6 measures ($6/16 \times .05 = .02$).

Another approach is to report all variables significant at the .05 level while attaching more importance and/or greater

confidence to differences having a smaller probability of error, e.g., findings significant at .02 or .01.

For this research, a compromise was adopted. In testing the global hypotheses, a minimum number of significant variables was set as outlined above. Differences of $p = .05$ are reported as significant but greater confidence is placed in significance levels of .02 or above.

The same criteria for reporting and interpreting significance levels were applied to the analysis of group differences and change for the loss sample. Hypothesis 4 (group differences in attachment) was measured with 15 measures. For testing this hypothesis, the criterion for a significant global difference in attachment was set at 5/15 measures ($5/15 \times .05 = .02$). Again, for each global hypothesis, differences of $p = .05$ are reported as significant while the .02 level of significance is treated as representing the more desirable margin of error for safely rejecting the null hypothesis.

7.2 Testing Individual Variables

When testing the global hypotheses, a minimum number of significant findings is specified without considering the relative importance of single measures or combinations of measures. This does not take into account the possibility that certain variables may be more sensitive measures of attachment than others. For this reason, the attachment variables are also considered separately, i.e., apart from their contribution to the

global hypotheses. When variables are considered separately, probabilities of .05 are treated as statistically significant but greater confidence is placed in significance levels of .02 or more. These significance criteria were also applied to the individual analyses of the 12 additional variables.

CHAPTER FOUR

THE MAIN SAMPLE RESULTS

The results of the investigation are reported in the following manner: first, the two groups of subjects - primigravidas and multigravidas - are compared for variables which bear directly on the main hypotheses; they are then compared for variables (such as the incidence of ultrasound) which could have obscured the outcome of tests of the major hypotheses.

1. Comparisons between First and Second Pregnancies

The first hypothesis states that primigravidas will show greater attachment to the unborn child than multigravidas on all measures except for negative feeling and conflict about the baby. The second hypothesis predicts that negative feeling and conflict will be greater among multigravidas. These predictions apply to both early and later stages of pregnancy.

A modification in scoring was necessary for two of the main variables: Affect and Global Score. The category "neutral" (see Appendix B) made it difficult to assume the presence of an underlying continuum, and this in turn made it difficult to apply a meaningful matched-pairs analysis. Because very few subjects in the main sample received a score of "neutral" (the highest in any analysis was 10/90), these subjects were removed

from the analysis and the Wilcoxon was used to analyse group differences for the remaining categories. These categories were assumed to have an underlying continuum involving varying degrees of positive feeling.

When differences for a variable were significant at both early and late stages of pregnancy, it is relevant to ask whether differences between groups at one stage were greater or less than the differences between groups at the other stage. To answer this question, the Wilcoxon was used to analyse the significance of the differences between the difference scores for early compared to the difference scores for late pregnancy.

The Wilcoxon test utilizes only those pairs for which a difference between the ranks of a pair occurs; tied scores are discarded (Colton, 1974; Ferguson, 1981; Siegel, 1956; Hull & Nie, 1981). Because tied scores are discarded, it is possible that a substantial portion of pairs do not differ despite a statistically significant result obtained from the pairs remaining in the analyses. The numbers of tied scores discarded are shown in the accompanying tables and the mean number of ties was not significantly higher where a significant result was obtained from the Wilcoxon (see Section 1.4)

The comparisons for early pregnancy are summarized in Table 30. The comparisons for late pregnancy are summarized in Table 31. One-tailed tests of significance were applied for all analyses because the direction of expected differences was predicted. When a significant result was in the opposite

direction to that predicted, a two-tailed test of significance was applied. The findings are described under the following main headings:

1. Early pregnancy comparisons
2. Late pregnancy comparisons
3. Variables significant at both stages of pregnancy
4. Analysis of tied scores
5. Summary of group differences

1.1 Early Pregnancy Comparisons

Image of the Baby:

Of the three items measuring Image of the Baby (see Table 30), a significant difference between the groups was found for Appearance of the Baby. The primigravidas reported a clearer perception of appearance of the baby significantly more often than the multigravidas ($z = 2.10$, $p = .02$).

Postnatal Picture:

The differences between the primigravidas and multigravidas for Proximity and Affect associated with a postnatal picture were not significant (Table 30).

Communication with the Baby:

The difference between the primigravidas and the multigravidas in frequency of Communication with the Baby

Table 30 Comparisons of the primigravidae and the multigravidae for maternal attachment in early pregnancy

| <u>Variable</u> | | <u>Milcoxon Test (n=45)</u> | | | |
|---------------------------------|-------------|-----------------------------|-------------|---------------|-------------|
| <u>Image of the Baby</u> | <u>iles</u> | <u>-Ranks</u> | <u>Mean</u> | <u>+Ranks</u> | <u>Mean</u> |
| <u>Sex of the Baby</u> | 20 | 14 | 13.64 | 11 | 12.18 |
| <u>Appearance of the Baby</u> | 18 | 19 | 14.55 | 8 | 12.69 |
| <u>Personality of the Baby</u> | 15 | 15 | 15.50 | 15 | 15.50 |
| | | | | | <u>Z</u> |
| | | | | | <u>p</u> |
| | | | | | .77 .22 |
| | | | | | 2.10 .02* |
| | | | | | .00 .50 |
| <u>Postnatal Picture</u> | | | | | |
| <u>Proximity</u> | 20 | 11 | 9.64 | 14 | 15.64 |
| <u>Affect (n=37)</u> | 22 | 8 | 6.88 | 7 | 9.29 |
| | | | | | 1.52 .12 |
| | | | | | .28 .39 |
| <u>Communication with Baby</u> | | | | | |
| <u>Verbal Communication</u> | 18 | 19 | 12.68 | 8 | 17.13 |
| <u>Tactile Communication</u> | 18 | 11 | 15.77 | 16 | 12.78 |
| | | | | | 1.25 .11 |
| | | | | | .37 .36 |
| <u>Thoughts about Baby</u> | | | | | |
| <u>Frequency of Thoughts</u> | 13 | 25 | 17.28 | 7 | 13.71 |
| <u>Duration of Thoughts</u> | 15 | 20 | 15.75 | 10 | 15.00 |
| <u>Intensity of Thoughts</u> | 17 | 18 | 13.44 | 10 | 16.40 |
| | | | | | 3.14 .001* |
| | | | | | 1.70 .05* |
| | | | | | .88 .19 |
| <u>Positive Feeling</u> | 15 | 14 | 16.79 | 16 | 14.38 |
| <u>Negative Feeling</u> | 8 | 13 | 15.88 | 24 | 20.69 |
| <u>Conflict</u> | 10 | 14 | 14.89 | 21 | 20.07 |
| <u>Anxiety-Health of Baby</u> | 10 | 22 | 18.00 | 13 | 18.00 |
| <u>Anxiety-Self as Mother</u> | 6 | 19 | 21.16 | 20 | 18.90 |
| <u>Global Score (n=41)</u> | 18 | 15 | 12.10 | 8 | 11.81 |
| <u>Global Score (Sign test)</u> | 23 | 13 | | 5 | |
| | | | | | 1.32 .09 |
| | | | | | .05* |

* statistically significant

(verbal and tactile) was not significant (Table 30).

Thoughts about the Baby:

The primigravidas reported thinking about the coming baby significantly more often than the multigravidas during early pregnancy ($z = 3.14$, $p = .001$), and these thoughts lasted significantly longer at any one time ($z = 1.70$, $p = .05$). The difference between primigravidas and multigravidas in intensity of thoughts about the baby was not significant (Table 30).

Positive Feeling:

The difference between groups in Positive Feeling about the baby was not significant (Table 30).

Negative Feeling:

The multigravidas reported significantly more Negative Feeling about the baby than the primigravidas ($z = 2.19$, $p = .01$).

Conflict:

The multigravidas also reported significantly more Conflict about the baby in early pregnancy than the primigravidas ($z = 1.74$, $p = .04$).

Anxiety-Health of Baby:

The difference between the primigravidas and the

multigravidas for anxiety about the health of the baby was not significant (see Table 30).

Anxiety-Self as Mother:

During early pregnancy, the difference between the primigravidas and multigravidas in anxiety about themselves as mothers was not significant (Table 30).

Global Score:

When group differences were tested using the 3 original scoring categories, there tended to be more primigravidas than multigravidas scored "mostly positive" category but the difference was not significant ($z = 1.32, p = .09$). However, when subjects who scored "mostly negative" and "about equal" were combined and compared with subjects who were "mostly positive", the difference between groups was found to be significant (Sign test, $p = .05$).

1.2 Late Pregnancy Comparisons

Image of the Baby:

There were no significant differences between the primigravidas and multigravidas on any of the items measuring Image of the Baby during late pregnancy (see Table 31).

Table 31 Comparisons of the primigravidae and the multigravidae for maternal attachment in late pregnancy

| Variable | Wilcoxon Test (n=45) | | | | |
|---------------------------------|----------------------|--------|-------|--------|-------|
| | Ties | -Ranks | Mean | +Ranks | Mean |
| <u>Image of the Baby</u> | | | | | |
| Sex of the Baby | 17 | 17 | 13.26 | 11 | 16.41 |
| Appearance of the Baby | 17 | 12 | 16.00 | 16 | 13.38 |
| Personality of the Baby | 15 | 16 | 13.94 | 14 | 17.29 |
| | | | | | Z |
| | | | | | R |
| <u>Postnatal Picture</u> | | | | | |
| Proximity | 28 | 8 | 8.56 | 9 | 9.39 |
| Affect (n=42) | 25 | 9 | 7.89 | 8 | 10.25 |
| | | | | | .38 |
| | | | | | .35 |
| | | | | | .26 |
| | | | | | .40 |
| <u>Communication with Baby</u> | | | | | |
| Verbal Communication | 11 | 22 | 17.98 | 12 | 16.63 |
| Tactile Communication | 20 | 14 | 10.54 | 11 | 16.14 |
| | | | | | 1.68 |
| | | | | | .40 |
| | | | | | .34 |
| <u>Thoughts about Baby</u> | | | | | |
| Frequency of Thoughts | 16 | 13 | 17.28 | 16 | 13.71 |
| Duration of Thoughts | 13 | 20 | 15.90 | 12 | 17.50 |
| Intensity of Thoughts | 16 | 13 | 16.46 | 16 | 13.81 |
| | | | | | .32 |
| | | | | | 1.01 |
| | | | | | .16 |
| | | | | | .47 |
| <u>Positive Feeling</u> | 18 | 15 | 13.40 | 12 | 14.75 |
| <u>Negative Feeling</u> | 16 | 9 | 13.67 | 20 | 15.60 |
| <u>Conflict</u> | 12 | 13 | 12.85 | 20 | 19.70 |
| <u>Anxiety-Health of Baby</u> | 17 | 21 | 14.98 | 7 | 13.07 |
| <u>Anxiety-Self as Mother</u> | 8 | 19 | 20.24 | 18 | 17.69 |
| <u>Global Score (n=39)</u> | 17 | 15 | 11.90 | 7 | 10.64 |
| <u>Global Score (Sign test)</u> | 21 | 14 | | 4 | 1.69 |
| | | | | | .05* |
| | | | | | .02* |
| | | | | | .39 |
| | | | | | .02* |
| | | | | | .02* |
| | | | | | .01* |
| | | | | | .31 |
| | | | | | .05* |
| | | | | | .02* |

* statistically significant

Postnatal Picture:

The differences between the groups for the two items measuring the Postnatal Picture of mother and baby were not significant (Table 31).

Communication with the Baby:

During late pregnancy, the difference between the primigravidas and multigravidas in amount of Tactile Communication with the baby was not significant (see Table 31), but it was significant for Verbal Communication ($z = 1.68$, $p = .05$). The primigravidas spoke or sang to the baby significantly more often than the multigravidas.

Thoughts about the Baby:

There were no significant differences between the groups for items measuring frequency, duration or intensity of thoughts about the baby during late stages of pregnancy (Table 31).

Positive Feeling:

The groups did not differ significantly for Positive Feeling about the baby (see Table 31).

Negative Feeling:

During late pregnancy, the multigravidas reported significantly more Negative Feeling about the baby than did the primigravidas ($z = 2.04$, $p = .02$).

Conflict:

The multigravidas also reported significantly more Conflict related to the baby than did the primigravidas ($z = 2.03, p = .02$).

Anxiety-Health of Baby:

During late pregnancy, the primigravidas were significantly more anxious about the health of their babies ($z = 2.54, p = .01$, two-tailed test).

Anxiety-Self as Mother:

The two groups did not significantly differ in amount of anxiety about their capacities as mothers (Table 31).

Global Score

The difference between the groups for the Global Score (balance of positive and negative feeling) was significant ($z = 1.69, p = .05$). Significance increased ($p = .02$) when the subjects who scored "mostly negative" and "about equal" were combined and compared with those who were "mostly positive". As in early pregnancy, the primigravidas were more positive overall than the multigravidas.

1.3 Variables Significant at Both Stages of Pregnancy

Significant differences between the primigravidas and the multigravidas were found at both early and late pregnancy for

three variables: negative feeling; conflict; and the global score. The multigravidas expressed significantly more negative feeling and conflict at both stages of pregnancy and significantly less positive feeling for the global score. The Wilcoxon Test was used to test the significance of the difference between the difference scores for early pregnancy and the difference scores for late pregnancy. The results were not significant, i.e., the differences between the two groups for negative feeling, conflict and the global score in early pregnancy were not significantly greater or significantly less than the differences between the groups in late pregnancy.

1.4 Statistical Cautions

For early pregnancy comparisons between the groups, the number of tied scores (from all 16 measures) ranged from 6-22 with a mean of 15.5, i.e., on the average, 36% of subjects showed an identical degree of attachment to the baby. For late pregnancy comparisons between groups, the overall range of tied scores was 8-28 with a mean of 16.69 (37%).

Table 32 shows the ranges and means for: all variables, significant variables and nonsignificant variables. Where significant differences between groups were found, the average number of ties tends to be somewhat smaller, but none of the proportional differences were statistically significant. ♦

The Wilcoxon test, unlike the analysis of variance, may be significant if other features of the distribution than the

means of the samples, differ from one another, e.g., the scatter of the scores or the skew. The variables which gave significant results were compared by examining the means, the medians, the standard deviations and the ranges; in all cases the hypothesized difference in central tendency was the only difference observed.

1.5 Summary of Group Comparisons

During early pregnancy, the primigravidas reported a significantly clearer image of the appearance of the unborn baby than the multigravidas. They also thought about the baby significantly more often and for longer periods of time than the multigravidas. The multigravidas reported significantly more negative feeling and conflict and this was reflected in less overall positive feeling in the global score (the balance of positive and negative feeling).

During late pregnancy, the primigravidas spoke or sang to their babies significantly more often than the multigravidas and they experienced considerably more anxiety about the health of their babies. They were also more positive than the multigravidas in their overall feeling about the coming baby (Global Score). The multigravidas continued to have significantly more negative feeling and conflict about their babies than the primigravidas.

In spite of the differences between groups on some of the measures, the results failed to confirm the first hypothesis

Table 32 Comparison of the mean number of ties for total variables, significant variables and nonsignificant variables

| | <u>Early pregnancy</u> (n=45 pairs) | | <u>Late Pregnancy</u> (n=45 pairs) | |
|--------------------------------|--|----------------|---------------------------------------|----------------|
| | <u>Range</u> | <u>Mean</u> | <u>Range</u> | <u>Mean</u> |
| <u>All Measures</u> | 6-22 | 15.25 (34%) | 8-28 | 16.69 (37%) |
| <u>Significant Measures</u> | 8-19 | 12.17 (27%) | 11-18 | 14.8 (33%) |
| <u>Nonsignificant Measures</u> | 6-22 | 16.1 (36%) | 8-28 | 17.55 (39%) |

predicting greater attachment to the unborn child among women in a first pregnancy.

Significant differences had to occur on 5/14 measures before the null hypothesis of no differences could be rejected. During early pregnancy, the primigravidas showed significantly greater attachment on 4/14 measures and of these, only two were significant at $p = .02$ or less. During late pregnancy, the primigravidas showed significantly greater attachment on only 3/14 measures. Of these, two were significant at $p = .02$ or less.

The second hypothesis which predicted greater negative feeling and conflict among multigravidas was confirmed for both early and late stages of pregnancy. Both measures were significant at $p < .05$ during early pregnancy and during late pregnancy both were significant at $p = .02$.

When the groups significantly differed on variables at both stages of pregnancy (negative feeling, conflict and global score), the differences between difference scores at each stage were checked. These were not significant, that is, the differences at one stage of pregnancy were neither greater or less than the differences at the other stage of pregnancy.

At both stages of pregnancy, an average of approximately one-third of the total number of paired subjects received tied scores, i.e., showed no difference in attachment.

2. Change in Attachment

The third hypothesis predicts that both primigravidas and multigravidas will show an increase in attachment as pregnancy progresses. To test this hypothesis early pregnancy measures were compared with late pregnancy measures for each group ($n=45$) and for the two groups combined ($n=90$). The Wilcoxon test was used to measure change. The direction of change as well as the magnitude of change is reflected in the findings.

When significant change was found for both groups, the Wilcoxon was applied to the difference between the difference scores for each group. This analysis was done to see whether change in one group was significantly greater than change in the other group.

The question of tied scores again arises in the analysis of change. Where significant change in attachment is found, it is still possible that a large number of subjects remained constant from early to late pregnancy (see Section 2.3).

Table 33 gives the findings for the primigravidas, Table 34 for the multigravidas and Table 35 for the combined sample. One-tailed tests of significance were applied when differences were in the predicted direction; otherwise two-tailed tests were used. The findings are reported under the following headings:

1. Differences between early and late attachment
2. Variables showing significant change for both groups
3. Summary of change in attachment

2.1 Differences between Early and Late Attachment

Image of the Baby:

The primigravidas showed a significant increase in clarity in perception of the Sex of the Baby as pregnancy progressed ($z = 1.82, p = .03$). In spite of this significant increase, 56% of the primigravidas received tied scores, i.e., showed no change between early and late pregnancy. 48% of the subjects with tied scores received the maximum score at the time of the first pregnancy interview, i.e., they had no further room to increase at the time of the late pregnancy interview. The multigravidas showed a tendency to increase ($z = 1.59, p = .06$). When the groups were combined ($n=90$) the increase was highly significant ($z = 2.40, p = .008$). Close to half of the combined sample (49%) received tied scores, i.e., showed no change in either direction. Of these, 43% had no room to increase, i.e., received the maximum score at the time of the first interview.

The change for the primigravidas in perception of the Appearance of the Baby in late pregnancy was not significant (Table 33), but an increase among the multigravidas was ($z = 1.83, p = .03$). 53% of the multigravidas received tied scores and of these, 8% had no further room to increase. The change for combined groups was not significant (Table 35).

Increased clarity in perception of the Personality of the Baby approached significance in the primigravida group ($z = 1.55, p = .06$) and in the multigravidas, was clearly

Table 33 Change in attachment from early to late pregnancy:
primigravida subjects

| <u>Milcoxon Test (n=45, 1 tailed test)</u> | | | | | | |
|--|-------------|---------------|-------------|---------------|-------------|------------|
| <u>Variable</u> | <u>Iles</u> | <u>-Ranks</u> | <u>Mean</u> | <u>+Ranks</u> | <u>Mean</u> | <u>Z</u> |
| <u>Image of the Baby</u> | | | | | | <u>P</u> |
| Sex of the Baby | 25 | 7 | 8.00 | 13 | 11.85 | -1.83 .03* |
| Appearance of the Baby | 25 | 12 | 11.50 | 8 | 9.00 | -1.23 .11 |
| Personality of the Baby | 22 | 8 | 10.88 | 15 | 12.60 | -1.55 .06 |
| <u>Postnatal Picture</u> | | | | | | |
| Proximity | 30 | 4 | 7.50 | 11 | 8.18 | -1.70 .04* |
| Affect (n=39) | 27 | 5 | 6.98 | 7 | 6.7 | -.35 .36 |
| <u>Communication with Baby</u> | | | | | | |
| Verbal Communication | 22 | 6 | 11.33 | 17 | 12.24 | -2.13 .02* |
| Tactile Communication | 22 | 6 | 13.67 | 17 | 11.41 | -1.70 .04* |
| <u>Thoughts about Baby</u> | | | | | | |
| Frequency of Thoughts | 16 | 16 | 15.88 | 13 | 13.92 | -.79 .21 |
| Duration of Thoughts | 24 | 12 | 10.13 | 9 | 12.17 | -.21 .42 |
| Intensity of Thoughts | 19 | 14 | 12.96 | 12 | 14.13 | -.15 .44 |
| <u>Positive Feeling</u> | 28 | 9 | 9.39 | 8 | 8.56 | -.38 .35 |
| <u>Negative Feeling</u> | 15 | 13 | 13.31 | 17 | 17.18 | -1.22 .11 |
| <u>Conflict</u> | 20 | 13 | 12.35 | 12 | 13.71 | -.05 .48 |
| <u>Anxiety-Health of Baby</u> | 23 | 10 | 12.30 | 12 | 10.83 | -.11 .46 |
| <u>Anxiety-Self as Mother</u> | 22 | 9 | 12.56 | 14 | 11.64 | -.76 .22 |
| <u>Global Score (n=39)</u> | 29 | 3 | | 7 | | -1.27 .10 |

* statistically significant

Table 34 Change in attachment from early to late pregnancy:
multigravida subjects

| <u>Variable</u> | | <u>Wilcoxon Test (n=45, 1 tailed test)</u> | | | | |
|--------------------------------|-------------|--|-------------|---------------|-------------|----------|
| <u>Image of the Baby</u> | <u>Ties</u> | <u>-Ranks</u> | <u>Mean</u> | <u>+Ranks</u> | <u>Mean</u> | <u>Z</u> |
| Sex of the Baby | 19 | 10 | 11.30 | 16 | 14.88 | -1.59 |
| Appearance of the Baby | 24 | 6 | 10.50 | 15 | 11.20 | -1.83 |
| Personality of the Baby | 21 | 7 | 12.21 | 17 | 12.62 | -1.84 |
| | | | | | | .06 |
| | | | | | | .03* |
| | | | | | | .03* |
| <u>Postnatal Picture</u> | | | | | | |
| Proximity | 29 | 7 | 8.50 | 9 | 8.50 | -.44 |
| Affect (n=42) | 27 | 6 | 7.00 | 9 | 8.67 | -1.02 |
| | | | | | | .15 |
| <u>Communication with Baby</u> | | | | | | |
| Verbal Communication | 28 | 3 | 12.67 | 14 | 8.21 | -1.82 |
| Tactile Communication | 23 | 5 | 14.80 | 17 | 10.53 | -1.70 |
| | | | | | | .03* |
| | | | | | | .04* |
| <u>Thoughts about Baby</u> | | | | | | |
| Frequency of Thoughts | 20 | 4 | 13.63 | 21 | 12.88 | -2.91 |
| Duration of Thoughts | 26 | 9 | 9.56 | 10 | 10.40 | -.36 |
| Intensity of Thoughts | 21 | 10 | 11.15 | 14 | 13.46 | -1.10 |
| | | | | | | .14 |
| <u>Positive Feeling</u> | | | | | | |
| Negative Feeling | 20 | 15 | 9.39 | 10 | 8.56 | -.87 |
| Conflict | 18 | 12 | 12.96 | 15 | 14.83 | -.81 |
| Anxiety-Health of Baby | 20 | 12 | 12.35 | 13 | 13.71 | -.57 |
| Anxiety-Self as Mother | 18 | 17 | 14.24 | 10 | 13.60 | -1.27 |
| Global Score (n=41) | 22 | 12 | 14.24 | 11 | 13.60 | -.05 |
| | 24 | 7 | 9.93 | 10 | 8.35 | -.33 |
| | | | | | | .37 |

* statistically significant

Table 35 Change in attachment from early to late pregnancy:
total sample

| <u>Variable</u> | | <u>Wilcoxon Test (n=90, 1 tailed test)</u> | | | | |
|--------------------------------|----------|--|-------------|--------------|-------------|----------|
| <u>Image of the Baby</u> | <u>N</u> | <u>-Rank</u> | <u>Mean</u> | <u>+Rank</u> | <u>Mean</u> | <u>Z</u> |
| Sex of the Baby | 44 | 17 | 18.85 | 29 | 26.22 | -2.40 |
| Appearance of the Baby | 49 | 18 | 22.42 | 23 | 11.20 | -.35 |
| Personality of the Baby | 43 | 15 | 22.70 | 32 | 24.61 | -2.37 |
| | | | | | | .008* |
| | | | | | | .36 |
| | | | | | | .009* |
| <u>Postnatal Picture</u> | | | | | | |
| Proximity | 59 | 11 | 15.36 | 20 | 16.35 | -1.54 |
| Affect (n=81) | 54 | 11 | 13.45 | 22 | 14.38 | -.99 |
| | | | | | | .16 |
| <u>Communication with Baby</u> | | | | | | |
| Verbal Communication | 50 | 9 | 22.39 | 31 | 19.95 | -2.80 |
| Tactile Communication | 45 | 11 | 27.73 | 34 | 21.47 | -2.40 |
| | | | | | | .003* |
| | | | | | | .008* |
| <u>Thoughts about Baby</u> | | | | | | |
| Frequency of Thoughts | 36 | 20 | 28.25 | 34 | 27.06 | -1.52 |
| Duration of Thoughts | 50 | 21 | 19.31 | 19 | 21.82 | -.06 |
| Intensity of Thoughts | 40 | 24 | 23.42 | 26 | 27.42 | -.73 |
| | | | | | | .23 |
| <u>Positive Feeling</u> | | | | | | |
| | 48 | 24 | 21.75 | 18 | 21.17 | -.88 |
| <u>Negative Feeling</u> | | | | | | |
| | 33 | 25 | 25.80 | 32 | 31.50 | -1.44 |
| <u>Conflict</u> | | | | | | |
| | 40 | 25 | 23.70 | 25 | 27.30 | -.43 |
| <u>Anxiety-Health of Baby</u> | | | | | | |
| | 41 | 27 | 25.93 | 22 | 23.86 | -.87 |
| <u>Anxiety-Self as Mother</u> | | | | | | |
| | 44 | 21 | 23.48 | 25 | 23.52 | -.52 |
| <u>Global Score (n=80)</u> | | | | | | |
| | 53 | 10 | 14.70 | 17 | 13.59 | -1.01 |
| | | | | | | .16 |

* statistically significant

significant ($z = 1.84$, $p = .03$). 47% of the multigravidas received tied scores and of these, 14% had no further room to increase. When groups were combined the difference was highly significant ($z = 2.37$, $p = .009$). From the combined sample 48% showed no change between early and late pregnancy. Of these, 19% had no further room to increase.

Postnatal Picture:

The primigravidas reported an image of increased physical Proximity to the baby as pregnancy progressed ($z = 1.70$, $p = .04$). 67% of the primigravidas received tied scores; 83% of these ties left no further room for an increase. The difference for the multigravidas was not significant (see Table 34). The difference for combined groups came close but did not reach statistical significance ($z = 1.54$, $p = .06$).

None of the group differences for Affect (associated with the postnatal picture) reached significance (Tables 33-35).

Communication with the Baby:

Verbal Communication with the baby increased in late pregnancy among both the primigravidas ($z = 2.13$, $p = .02$) and the multigravidas ($z = 1.82$, $p = .03$). 49% of the primigravidas received tied scores and of these, no subjects (0%) obtained maximum score at the first interview, i.e., all of these subjects had the potential to increase. Of the multigravidas, 62% received tied scores and 7% of these ties had no further room to

increase. The significance level was even higher when the groups were combined ($z = 2.80$, $p = .003$). 56% of the total sample received tied scores. Of these, only 4% had no further room to increase.

Tactile Communication with the baby also increased for both the primigravidas ($z = 1.70$, $p = .04$) and the multigravidas ($z = 1.70$, $p = .04$). When the groups were combined, the increase was highly significant ($z = 2.39$, $p = .008$). The number of ties for the primigravida group was 49% with 23% having no further room for an increase; for the multigravidas, 51% of the scores were ties and 30% had no further room to increase. 50% of the combined sample showed no change. Of these, 13% had no further room to increase.

Thoughts about the Baby:

The difference in Frequency of Thoughts about the baby between early and late pregnancy was not significant for the primigravidas (see Table 33) but there was a highly significant increase for the multigravidas ($z = 2.91$, $p = .002$). 44% of the multigravidas' scores were tied and of these, 30% had no further room to increase. When groups were combined the increase did not quite reach significance ($z = 1.53$, $p = .06$).

The changes for Duration of Thoughts and Intensity of Thoughts about the baby were not significant for either the primigravida group (Table 33) or the multigravida group (Table 34). This was also the case for the combined analysis (Table 35).

Positive Feeling:

The changes in Positive Feeling about the baby from early to late stages of pregnancy were not significant (Tables 33-35).

Negative Feeling:

A slight tendency was found for Negative Feeling to increase for both groups but the differences were not significant (see Tables 33 and 34). When the groups were combined the change was accentuated but did not reach significance (Table 35).

Conflict:

The change in Conflict about the baby was not significant for either the primigravidas (Table 33), the multigravidas (Table 34) or the combined groups (Table 35).

Anxiety-Health of Baby:

The change in Anxiety about the Health of the Baby was not significant for the primigravidas (Table 33). For the multigravidas, there was a tendency towards a decrease in anxiety but the difference did not reach significance (Table 34). Combining the groups revealed an overall tendency for anxiety to decrease but the difference was not significant (Table 35).

Anxiety-Self as Mother:

Neither the primigravidas (Table 33) nor the multigravidas (Table 34) showed significant change in the degree of anxiety

about their capacity as mothers. The difference for the combined groups was also not significant (Table 35).

Global Score:

None of the groups - the primigravidas (Table 33), the multigravidas (Table 34) or the combined groups (Table 35) - showed significant change in the balance of positive and negative feelings about the baby as pregnancy progressed.

2.2 Variables Showing Significant Change for Both Groups

A significant increase was found for both groups for three variables: Sex of the Baby, Verbal Communication and Tactile Communication. Comparing the groups for relative amount of change for these variables yielded nonsignificant differences.

2.3 Statistical Cautions

From the total sample ($n=90$) and from all 16 variables, the number of subjects who received tied scores ranged from 33-59 with a mean of 45.81. That is, almost half of the subjects showed no change in attachment from early to late stages of pregnancy. For the primigravidas ($n=45$) the number of ties ranged from 15-31 with a mean of 23.31. Ties for the multigravidas ranged from 18-29 with a mean of 20. Table 36 shows that the percentage of tied scores is slightly higher for the variables showing significant change but none of the differences between these proportions were significant.

Table 36 Comparison of the mean number of ties for total variables, significant variables and nonsignificant variables

| | <u>Primigravidas</u> (n=45) | | <u>Multigravidas</u> (n=45) | | <u>Combined sample</u> (n=90) | |
|--------------------------------|--------------------------------|----------------|--------------------------------|----------------|----------------------------------|----------------|
| | <u>Range</u> | <u>Mean</u> | <u>Range</u> | <u>Mean</u> | <u>Range</u> | <u>Mean</u> |
| <u>All Measures</u> | 15-31 | 23.31 (52%) | 18-29 | 20 (44%) | 33-59 | 45.81 (51%) |
| <u>Significant Measures</u> | 22-30 | 24.75 (55%) | 21-28 | 23.2 (52%) | 43-50 | 45.5 (51%) |
| <u>Nonsignificant Measures</u> | 15-31 | 20.42 (43%) | 18-29 | 22.18 (49%) | 33-59 | 41.25 (46%) |

The variables which gave significant results were compared by examining the means, the medians, the standard deviations and the ranges. In all cases, the hypothesized difference in central tendency was the only difference observed.

2.4 Summary of Change in Attachment

The primigravidas formed an increasingly clear image of the sex of the baby as pregnancy progressed and communicated (both verbally and through touch) more frequently with the baby. They also reported increased physical closeness when visualizing themselves and their babies together following the birth.

The multigravidas reported an increasingly clear image of the sex, the appearance and the personality of the baby as pregnancy progressed and reported thinking about the baby more frequently during late pregnancy. Like the primigravidas, the multigravidas communicated with the coming baby (both verbally and through touch) more frequently during late pregnancy.

Although increases were found for several measures, the findings do not provide sufficient support for the hypothesis of a global increase in attachment as pregnancy progresses. An increase in 6/18 measures was required before the null hypothesis of no change could be rejected. The primigravidas showed a significant increase on only 4/16 measures. Only 1 of these measures, Verbal Communication, was significant at $p < .02$. The multigravidas significantly increased on 5/16 measures and only one, Frequency of Thoughts, was significant at $p < .02$. The

findings for the total sample ($n=90$) provide somewhat stronger support for the hypothesis of an increase in attachment. Increases were found for 4 variables and all four increases were highly significant.

Clarity in the image of the sex and of the personality of the baby both increased as did frequency of verbal and tactile communication with the baby.

Increases were found for both groups on three measures: image of the sex of the baby, verbal communication and tactile communication. Relative differences in these increases were not significant.

3. Possibly Confounding Variables

3.1 Confounding Variables Associated with Current Pregnancy Comparisons

A number of variables (see Chapter 3, Section 3.2) were examined in order to determine whether they might have a confounding influence upon the comparisons of the two groups of mothers and thereby obscure the outcome of tests of the attachment hypotheses. The t-test for related groups was used to analyse group differences for length of marriage. Either the Wilcoxon test or the Sign Test was used to analyse all other group differences. Two-tailed tests of significance were applied in all cases. No significant results were found for the following variables:

- 1) Quickening - has the subject felt movement?
- 2) Ultrasound - has the subject had ultrasound?
- 3) Planned Pregnancy - was the pregnancy planned or unplanned?
- 4) Difficulty Conceiving - was there any difficulty conceiving?
- 5) Complications of Pregnancy - were there any physical complications of pregnancy?
- 6) Support from Spouse - perceived emotional support from spouse during the course of pregnancy.
- 7) Support from Others - perceived emotional support from others (family, friends) during the course of pregnancy.
- 8) Stress during Pregnancy - occurrence of stressful life events during the course of pregnancy.
- 9) Maternal Education - highest educational level achieved.

The multigravidas tended to report less satisfaction with the amount of emotional support from their husbands during the course of the pregnancy but the difference between groups did not reach significance ($z = 1.69$, $p = .09$).

For all of the above variables one can assume that primigravidas and multigravidas were similar and any significant differences in attachment cannot be attributed to different exposures to any of the factors likely to follow from differences in these life experiences.

Significant differences between primigravidas and multigravidas were found for:

- 1) Employment - is the subject employed?
- 2) Postnatal Employment Plans - does the subject plan to work during the first postnatal year?
- 3) Length of Marriage - how long has the subject been married?

The primigravidas were significantly more often employed during pregnancy ($z = 3.35$, $p = .001$) and significantly more often planning to work during the first postnatal year ($z = 3.09$, $p = .002$). Because the two groups were matched for age, it follows that the multigravidas had been married significantly longer than the primigravidas ($t = 4.64$, $44df$, $p < .001$).

3.2 Primigravidas Compared with Multigravidas for the Time of First Pregnancy

There are other possible confounding influences invariably associated with use of the cross-sectional design. Because the comparison groups were made up of different individuals, one cannot assume that the primigravidas resembled the multigravidas as they had been when in their first pregnancy.

Apart from the differences in age and socioeconomic status at the time of first pregnancy (see Section 2.5.1), no significant differences were found and the samples can be regarded as alike for:

- 1) Ultrasound
- 2) Planned Pregnancy
- 3) Difficulty Conceiving
- 4) Complications of Pregnancy
- 5) Support from Spouse
- 6) Support from Others
- 7) Stress during Pregnancy
- 8) Maternal Education
- 9) Employment
- 10) Postnatal Employment Plans

A tendency was found for the groups to differ in Postnatal Employment Plans for the time of first pregnancy ($z = 1.91$, $p = .06$). The current primigravidas more often planned employment outside the home than did the multigravidas at the time of their first pregnancy.

3.3 Summary of the Results for the Additional Variables

The main groups - primigravidas and multigravidas - as well as being individually matched for age and socioeconomic status (see Section 2.4) were also effectively matched for all but two of the additional variables in the research. Significant differences between the groups were found for: Employment and Postnatal Employment Plans. A tendency towards a significant difference was found for one other variable: Support from Husband. The influence of these three variables upon maternal attachment will be examined in the next section.

The primigravidas were also compared to the multigravidas as they (the multigravidas) were when in their first pregnancy.

A tendency towards a significant difference was found for -

Postnatal Employment Plans.

4. Maternal Attachment and the Significant Additional Variables

There were significant differences between the primigravidas and multigravidas for three of the additional variables in the research. These variables were: Employment, Postnatal Employment Plans and Length of Marriage. The differences between groups in maternal attachment are therefore not necessarily independent of the effects of these three variables.

Two other variables included in the research have been emphasized in the literature on pregnancy: 1) the importance of adequate emotional support for the expectant mother, particularly from her spouse, and 2) the effects of ultrasound examination in early pregnancy upon maternal attachment to the fetus. In this sample, the difference for Support from Spouse showed that multigravidas tended to be less satisfied with the amount of support from their husbands than primigravidas ($p = .09$). The difference between groups for Ultrasound was not significant.

The relationship between attachment and each of the above additional variables was examined using the chi-square test for independent groups. Two-tailed tests of significance were applied.

4.1 Support from Spouse and Maternal Attachment

The original three scoring categories were used for this analysis (see Appendix E). Women who were "very satisfied", "satisfied" and "dissatisfied" were compared for differences in maternal attachment. These groups did not significantly differ in age, SES or gravid status.

No significant differences for maternal attachment were found.

4.2 Ultrasound and Maternal Attachment

Women who had received ultrasound prior to the early pregnancy interview ($n = 17$) were compared to women who had not received ultrasound during this period ($n = 73$). These groups did not significantly differ for age, SES or gravid status.

At the time of the early pregnancy interview (18-22 weeks gestation) women who had received ultrasound had a significantly clearer image of the appearance ($p = .03$) and personality ($p = .002$) of the baby than women who had not had ultrasound. They also reported significantly less negative feeling about the baby ($p = .03$) and were significantly more positive overall. (Global Score, $p = .03$).

By late pregnancy (30-34 weeks gestation) differences for the above measures were not significant. However, women who had received ultrasound early in pregnancy reported significantly more verbal communication ($p = .005$) and tactile communication

with the baby ($p = .01$) during late pregnancy and also reported significantly less conflict about the baby ($p = .003$).

4.3 Employment and Maternal Attachment

The subjects were divided into two groups according to whether they were employed (part or full time) or not employed outside the home. There were significantly more primigravidas in the working group ($p = .03$) and working mothers were also significantly older than non-working mothers ($p = .001$). Differences between groups for socioeconomic status were not significant.

During early pregnancy, non-working mothers had significantly higher attachment scores for: 1) Sex of the Baby ($p = .04$) 2) Personality of the Baby ($p = .002$) 3) the Global Score ($p = .03$). Working mothers showed significantly more anxiety about the health of the baby than did non-working mothers ($p = .02$).

During late pregnancy the groups differed for only one variable: working mothers again showed significantly more anxiety about the health of the baby ($p = .006$).

4.4 Postnatal Employment Plans and Maternal Attachment

The subjects were divided into two groups according to whether they planned to work (part or full time) or not work during the first year following the baby's birth. Significantly more primigravidas were among the group of mothers who planned to

work following the birth ($p = .003$). The groups did not differ significantly for either age or socioeconomic status.

Significant differences were found for two attachment variables during late pregnancy. Women who planned to work reported significantly more anxiety about the health of the baby ($p = .03$) and about themselves as mothers ($p = .01$) than those not planning to work. Significant differences on two variables is not much greater than would be expected by chance when testing differences for 16 variables, but the findings for anxiety and the findings for employment (reported in the previous section) to some extent complement and support one another.

4.5 Length of Marriage and Maternal Attachment

For this analysis, women were divided into two groups - those that had been married a shorter time (1-6 years) and those that had been married a longer time (7-14 years). There were significantly more multigravidas among the longer married group ($p = .001$). The longer married group was also significantly older ($p = .001$). The two groups were not significantly different for socioeconomic status.

There were no significant differences in attachment between the groups during early pregnancy.

During late pregnancy, women who were married longer showed significantly more negative feeling about the baby than women who had been married for a shorter time ($p = .03$). This difference in negative feeling was reflected in a significant

difference between groups on the Global Score (balance of positive and negative feeling). Women who had been married for a shorter period were significantly more positive than women who had been married longer ($p = .02$).

4.6 The Additional Variables and Gravid Status: Significant Results in Common

The differences in attachment associated with the three additional variables (Employment, Postnatal Employment Plans and Length of Marriage) were compared to the differences in attachment for gravid status (primigravidas /multigravidas) to see if there were any significant findings in common. This was done to check whether these variables might operate together to determine group differences in attachment (see Table 37).

4.6.1 Employment and Gravid Status

During early pregnancy, significant differences in Global Score and Anxiety-Health of Baby were associated with both employment (working/nonworking mothers) and gravid status (primigravidas/multigravidas) (Table 37). Primigravidas were more anxious about the health of their babies and more positive overall than were multigravidas as were working mothers compared with non-working mothers.

During late pregnancy, significant differences for both employment and gravid status were found for Anxiety-Health of Baby (Table 37). The direction of findings was as for early pregnancy with primigravidas reporting more anxiety than

Table 37 Employment, Postnatal Employment Plans and
Length of Marriage*: Significant Findings in
Common with Gravid Status

| <u>Employment & Gravid Status</u> | <u>Early pregnancy</u> | <u>Late pregnancy</u> |
|--|--|--|
| Anxiety-Health of Baby | p = .09 (P>M) p = .02 (W>NW) | p = .01 (P>M) p = .006 (W>NW) |
| Global Score (+ve feeling) | p = .05 (P>+veM) p = .03 (W>+ve NM) | |
| <u>Postnatal Employment Plans</u> <u>and Gravid Status</u> | | |
| Duration of Thoughts | p = .05 (P>M) p = .04 (PW>NPW) | |
| Anxiety-Health of Baby | | p = .01 (P>M) p = .03 (PW>NPW) |
| <u>Employment Status,</u> <u>Postnatal Employment Plans</u> <u>and Gravid Status</u> | | |
| Anxiety-Health of Baby | | p = .01 (P>M) p = .006 (W>NW) p = .03 (PW>NPW) |
| <u>Length of Marriage</u> <u>and Gravid Status</u> | | |
| Negative Feeling | | p = .02 (M>P) p = .03 (LM>SM) |
| Global Score | | p = .02 (P>+veM) p = .02 (LM>SM) |

*W=Working, NW=Not working, PW=Planning work,
NPW=Not planning work, LM=Longer married, SM=Shorter married

multigravidas and working mothers reporting more anxiety than non-working mothers.

4.6.2 Postnatal Employment Plans and Gravid Status

During early pregnancy significant differences in Duration of Thoughts about the baby were associated with both postnatal employment plans (planning/not planning to work) and gravid status (primigravidas/multigravidas) (Table 37). Primigravidas reported thinking about their babies for significantly longer periods of time than multigravidas and women who planned to work reported thinking about their babies significantly more often than women who did not plan to work.

During late pregnancy, significant differences for both variables were found for Anxiety-Health of Baby (Table 37). Primigravidas were significantly more anxious than multigravidas and women who planned to work were significantly more anxious than women who did not plan to work.

4.6.3 Length of Marriage and Gravid Status

During early pregnancy, no attachment variables yielded significant differences for both length of marriage and gravid status.

During late pregnancy, significant differences in attachment were associated with both variables for: Negative Feeling and the Global Score (see Table 37). Multigravidas

reported significantly more negative feeling (and over all less positive feeling) than primigravidas and longer married women significantly more than women who had been married for a shorter period.

5. Age and Maternal Attachment

For the analyses of the main variables (comparisons between primigravidas and multigravidas), subjects had been matched for age and socioeconomic status. The median age of the sample (28.33) was used to divide the sample into a "younger" group (20-28 years) and an "older" group (29-30 years). The resulting sample sizes were nearly equal. The two groups were then checked for differences in socioeconomic and gravid status. The difference between groups for gravid status was not significant, but older subjects were of a significantly higher socioeconomic status than younger subjects ($p < .001$).

The chi-square test for independent groups was used to test the relationship between age and maternal attachment. Two-tailed tests were applied.

From the 16 maternal attachment variables, significant differences between younger and older subjects were found for only one variable during early pregnancy and two variables during late pregnancy. During both early pregnancy ($p = .04$) and late pregnancy ($p = .02$), younger subjects reported thinking about the baby more frequently than older subjects. During late pregnancy, younger subjects also reported more positive feeling overall

i.e., as measured by the balance of positive and negative feeling in the global score ($p = .01$).

6. SES and Maternal Attachment

The median SES (Blisshen, 3.17) was used to divide the sample into a "higher" socioeconomic group (Levels 1-3) and a "lower" socioeconomic group (Levels 4-6). Sample sizes were: 37 subjects in the lower group and 53 subjects in the higher group. The two groups were then checked for differences in age and gravid status. The difference in gravid status was not significant but as reported above, subjects of higher socioeconomic levels were significantly older than subjects of lower socioeconomic levels.

The chi-square test for independent groups was used to analyse the relationship between SES and maternal attachment. Two-tailed tests of significance were applied.

During early pregnancy, significant differences were found for:

1) Sex of the Baby: subjects from the lower socioeconomic level reported a clearer image of the sex of the baby than subjects from the higher socioeconomic group ($p = .04$).

2) Affect (associated with postnatal picture of mother and baby together): higher socioeconomic subjects were more positive than lower socioeconomic subjects ($p = .002$).

3) Verbal Communication: lower socioeconomic subjects spoke or sang more frequently to the baby ($p = .01$).

During late pregnancy, significant differences were found for:

1) Sex of the Baby: again, subjects from lower socioeconomic levels had a clearer image of the sex of the baby than subjects from higher socioeconomic levels.

2) Personality of the Baby: lower socioeconomic subjects also had a clearer image of the personality of the baby ($p = .003$).

3) Tactile Communication: lower socioeconomic subjects also reported touching or stroking the baby more frequently than upper socioeconomic level subjects ($p = .03$).

CHAPTER FIVE

DISCUSSION

The first hypothesis states that the primigravidas will show a greater attachment to the unborn child than the multigravidas - except for measures of negative feeling and conflict. The second hypothesis states that negative feeling and conflict will be greater among multigravidas. These predictions were based on suggestions that 1) first pregnancy is in certain ways unique i.e., more satisfying, more stressful, and 2) that greater negative feeling may be associated with later pregnancy. The assumption that pregnancy is a "crisis" that affects all women is also of interest.

The third hypothesis states that both groups will show an increase in maternal attachment as pregnancy advances.

Group comparisons in attachment will be discussed first (Hypotheses 1 and 2) followed by a discussion of change in attachment (Hypothesis 3). Finally, comments will be made about the possible influence of the additional variables and age and socioeconomic status upon maternal attachment.

1. Comparisons between Primigravidas and Multigravida

The suggestion that the upheaval or "crisis" of pregnancy affects all women was to some extent supported by the findings of the research. From sixteen measures of maternal attachment,

nonsignificant differences were found for eight measures at both early and late stages of pregnancy. As far as these variables are concerned, neither first nor second pregnancy can be described as unique.

1.1. Similarities between First and Second Pregnancies

During early pregnancy, both primigravidas and multigravidas assign a sex and a personality to their unborn infants, visualize themselves and their infants in close physical contact following the birth and communicate with them verbally and by touch. They also resemble one another on measures of duration and intensity of thoughts about the baby and on measures of positive feeling about their coming infants and anxiety about their capacities as mothers.

By late pregnancy, the two groups of women resemble one another in all of the areas noted above. In addition, early differences found in frequency of thoughts about the baby ($P > M$, $p = .001$) and clarity of perception of the baby's physical appearance ($P > M$, $p = .02$) were no longer evident.

Where quantitative differences between groups were not significant, there were nevertheless some striking differences in the content of the responses. This particularly applied to two measures of maternal feelings, i.e., positive feeling and anxiety. This material is described impressionistically because the study was not designed to statistically analyse differences in the quality of responses.

1.2 Qualitative Differences between Groups

Although both groups expressed positive feelings to an equal extent (e.g., excitement and pleasure in affectionate contact), the positive feelings of the primigravidas had a more "naive" quality, e.g., "I can hardly wait to see what it's like to hold the baby". By contrast, the multigravidas looked forward to the known and enjoyed pleasures of a small infant. The primigravidas more often described their positive feelings in terms of an exclusive twosome, mother and infant, whereas the multigravidas described positive contact with the new infant as a shared family group experience (husband and first child included).

Both groups expressed anxiety about their capacities as mothers to an equal extent. For the primigravida, anxiety centered around the unknown, arising from her lack of first hand experience in caring for babies. The technical aspects of caretaking were the issues for her; would she know when the baby was sick; would she be able to breastfeed? The multigravidas expressed very little concern about these matters. They knew what had to be done and how to do it. They were anxious about having sufficient stamina to deal with double the workload and to give double the love. The multigravidas were more concerned about meeting the requirements of the first child than those of the expected infant. The concern was how they could best help their child to adjust to the newcomer and share the attention that had until now been exclusively his.

The literature has consistently suggested that primigravidas experience more anxiety about mothering than women who already have a child. In this study, if anxiety about mothering had been measured solely in terms of basic caretaking skills, then the findings would likely have supported this view. Instead, the results suggest that a single criterion of maternal anxiety is too narrow and probably misleading. The multigravida, with caretaking experience behind her, is less apprehensive about her ability to meet the basic needs of a young infant. But the entry of a second child into the family highlights other maternal concerns. The issues have to do with the management of group relationships: sharing, rivalry etc., and the emotional resources required to deal with this. It is an aspect of mothering that is new and unexplored, and in this respect, the advent of a second child may provide a stimulus for further maturation as a mother.

1.3 Variables Significant at Both Stages of Pregnancy

The multigravidas reported significantly more negative feeling than the primigravidas ($p = .01$ in early pregnancy and $p = .02$ in late pregnancy) and significantly more conflict ($p = .04$ in early pregnancy and $p = .02$ in late pregnancy). The primigravidas were significantly more positive than the multigravidas for the global score ($P > +veM$, $p = .05$ and $p = .02$). These findings are discussed in detail below.

1.3.1 Negative Feeling and Conflict

The most common negative feeling expressed by second time mothers was about the new baby as an "intruder" upon the already established close relationship with the first child. This relationship was of primary importance to the multigravida and considerable thought went into how it could best be preserved. The focus for the negative feelings and conflict was the expected child; even though planned and wanted, this new arrival introduced change in the status quo, particularly a loss of closeness in the relationship with the first child.

The primigravidas sometimes saw the new baby as an "intruder" as well (although less frequently and less strongly). The issues for them were 1) disruption of closeness in the marital relationship and 2) disruption of an unencumbered, independent life as an individual. Two primigravidas expressed resentment that the husband and new baby might become close and exclude her from a relationship with both of them. In this unusual scenario, the baby and the husband were both viewed as competitors and she as the outsider.

Some negative feelings of the multigravida were related to caretaking issues - anticipation of the fatigue remembered after the first birth and expected to an even greater extent with the extra workload following the next birth. The primigravidas also

identified fatigue during the early months as a negative, but were more likely to minimize it's importance.

In describing these negative themes, it should be emphasized that they were almost always accompanied by positive references. The positive references were: pleasure in caring for a tiny baby, pleasure in watching the baby grow and develop, having a companion for the first child and becoming a family group.

Out of the total sample, only two subjects (both multigravidas) stated that, all things considered, the new arrival was not wanted. One subject was in an unstable marriage and considering separation. The other indicated that she was having her second child mainly for her daughter and that there was very little in it for her personally.

Even when the negative feelings outweighed the positive feelings (20% of the sample), it was not a question of the infant being wanted or unwanted. Nor were the difficulties and disadvantages generally described as being unmanageable or unsurmountable. Yet, only 19% of the sample reported "no" negative feelings whatsoever, making the absence of negative feelings the exception rather than the rule.

To some extent, what may be involved is realistic preparation for the tasks of infant care, in which case the greater negative feeling of the multigravidas could be interpreted as reflecting greater awareness of the attendant problems. In general, mothers of both groups appeared to be in a state of transition. The arrival of

a new baby (first or second) was described as entailing both gains and losses, gains in terms of the future and losses in terms of present relationships and presents lifestyle.

The findings of greater negative feeling and conflict in second pregnancy support the findings of previous studies (see Chapter 1, Section 3.4) and the view that the degree of "crisis" and new adaptation experienced by the multigravida is underestimated - both in the literature and possibly by professional and personal sources of care and support.

1.3.2 The Global Score

The global score adds new information to the findings reported so far. For the separate measure of positive feeling, the difference between the primigravidas and the multigravidas was not significant. For the separate measure of negative feeling, the difference between groups was significant, with the multigravidas reporting more negative feeling than the primigravidas. The global score combines these two measures. It weighs the amount of positive feeling reported by the subject against the amount of negative feeling, yielding a relative score. For example, a subject scoring "very positive" and "clear negative" would receive a global score of "mostly positive". Subjects scoring "clear positive" and "clear negative" would be scored "about equal". For the main sample, the category "neutral" was removed and the remaining categories were analysed on a continuum of "least to most" positive feeling. This

meant that the two groups might not differ for the independent measure of "positive feeling" but yet differ significantly with respect to positive feeling as measured by the global score. This is precisely what occurred. Positive feeling outweighed negative feeling significantly more often in the primigravida group at both early ($p = .05$) and late ($p = .02$) stages of pregnancy.

During early pregnancy, 32% of the primigravidas compared with 52% of the multigravidas scored "mostly negative" or "about equal", and 68% of the primigravidas compared with 48% of the multigravidas scored in the "mostly positive" category. During late pregnancy these figures were: 24% of the primigravidas compared with 55% of the multigravidas scoring "mostly negative" or "about equal" and 76% of the primigravidas compared with 45% of the multigravidas scoring "mostly positive".

The result for the global score complements the finding of a significant difference for negative feeling between groups and adds a new perspective to the absence of a significant difference for the separate measure of positive feeling.

1.4 Variables Significant at One Stage of Pregnancy

The primigravidas experienced significantly more anxiety about the health and welfare of the baby during late stages of pregnancy ($p = .01$). During early pregnancy the primigravidas reported thinking about their babies more frequently than the multigravidas and this difference was highly significant ($p = .001$).

A significant difference between the two groups in early pregnancy was also found for appearance of the baby (P>M, $p = .02$). These findings are discussed below.

1.4.1 Anxiety-Health of Baby

Concerns about the health of the baby were related to its physical and emotional well-being and applied to both immediate status (intrauterine health) and to future status (condition at birth and postnatal health). The primigravidas expressed greater anxiety about physical deformity (missing limbs), retardation and/or brain damage. The possibility that the baby would have a difficult temperament (hyperactivity, excessive crying) also featured prominently in their thoughts.

Greater anxiety about the baby's health appeared to overlap with the primigravidas' relative lack of confidence about caretaking abilities (anxiety-self as mother). Fears about physical deformity were expressed in conjunction with doubts about how well they had met the prenatal nutritional requirements of the infant and the potential negative effects of such things as an occasional cigarette or drink. Fears about difficult temperament were usually accompanied by self-doubts, e.g., whether they would be able to accurately identify the needs of the infant and respond appropriately. They were anxious that they would either over-

respond and "spoil" the baby or under-respond and "deprive" the baby.

Greater anxiety about the health of the baby does not appear to be associated with greater negative feeling and conflict about the baby. The primigravidas, more anxious about their babies, had fewer negative feelings about them. The multigravidas, despite greater confidence in the physical and emotional health of the new infant, experienced considerably more negative and conflicting feelings than did the primigravidas.

One possibility is that the multigravidas, more confident of their abilities to care and respond to an infant, feel less guilty about negative feelings towards the second and therefore more readily express them. The tendency of the primigravidas to link anxieties about their babies with perceived failures of their own would lend support to such a view. The primigravida clearly felt that she was somehow responsible for the damage, whether it be "bad genes", neglect or overindulgence. According to this view, fears about physical handicap and emotional disturbance would be interpreted as reflecting anxiety about hostile feelings towards the infant. The multigravidas have learned that infants survive and even thrive despite some degree of negative feeling or conflict on the part of their mothers and that knowledge may reduce anxiety and facilitate the expression of negative feeling.

Another possible explanation is that the primigravida, lacking previous experience, is simply and genuinely afraid that she

will bungle the situation. Some primigravidas expressed unreserved confidence in their ability to handle their new role (29% scored "no anxiety"), but the majority (71%) felt that proof of their maternal abilities lay ahead of them.

1.4.2 Frequency of Thoughts

The finding of greater frequency of thoughts about the baby among the primigravidas may in part be due to the fact that pregnancy is a new experience for them. Greater anxiety about the baby's health may be a part of this. Additionally, the multigravidas' attention is more divided because they already have a young infant of an age that demands considerable thought and attention. All three of the above may in some way interact.

The difference between the groups in frequency of thoughts disappears by late pregnancy. The multigravida's attention to the coming infant may increase as its physical presence and imminent arrival become more of a reality as pregnancy advances.

1.4.3 Appearance of the Baby

Examination of the content of the responses may clarify the reasons why the primigravidas had a clearer image of the appearance than did the multigravidas.

In early pregnancy, the primigravidas reported many fantasies about who the child would resemble. There were images of herself, of her spouse and of grandparents. By late pregnancy, anxiety about

the welfare of the baby became more predominant and the primigravidas more frequently said that appearance "doesn't matter that much, as long as the baby is healthy." At the same time, multigravidas showed increasing interest in the appearance of the new baby during late pregnancy (see Table 34).

The responses of the multigravida were far less detailed during early pregnancy. A general resemblance to the first child was most frequently described, even when the new child was seen to be of the opposite sex. This again suggests that attachment to the first child is primary and that acceptance of a new and different individual takes place gradually. By late pregnancy, differences between groups on this variable disappeared and this was partly accounted for by the increased clarity in the multigravida's perception of the appearance of the new child.

2. Change in Attachment

It was predicted that both groups would show an increase in attachment to the unborn child as pregnancy progressed. This relationship was tested by comparing early pregnancy scores with late pregnancy scores for each group and then for the total sample.

Increase in attachment was clearest in two areas: Image of the Baby and Communication with the Baby. It was most pronounced in the findings for the total sample (groups combined) for: Sex of the Baby ($p = .008$), Personality of the Baby ($p = .009$), Verbal Communication ($p = .003$) and Tactile Communication ($p = .008$).

Only the multigravidas showed a significant increase in Appearance of the Baby ($p = .03$) and Frequency of Thoughts about the baby ($p = .002$), and only primigravidas showed an increase for Postnatal Picture (perceived closeness of mother and baby following the birth) ($p = .04$).

The findings for change in attachment must be interpreted with reference to the baseline scores of each group. A highly significant increase in one group e.g., the increase for multigravidas in Frequency of Thoughts about the baby, does not necessarily mean that the groups significantly differed in late pregnancy. The late pregnancy comparisons confirm this. Although there was a highly significant increase in frequency for the multigravidas ($p = .002$), the two groups did not significantly differ for this variable during late pregnancy (see Table 31). Thus, the significant increase for the multigravidas reflects their significantly lower scores during early pregnancy (P>M, $p = .001$). In early pregnancy, primigravidas reported thinking about the coming infant significantly more often than multigravidas and they did not significantly change (in either direction) as pregnancy advanced. Putting this another way, multigravidas started out pregnancy with significantly fewer thoughts about the coming baby ($p = .001$), but by late pregnancy had caught up to the primigravidas. The same pattern occurred for perception of the Appearance of the Baby. Primigravidas reported a clearer image of the appearance than multigravidas in early pregnancy ($p = .02$) but by late pregnancy,

the difference between groups was not significant (see Table 31) because multigravidas had significantly increased ($p = .03$) and primigravidas had not. For the variable, Postnatal Picture, the reverse pattern occurred. In early pregnancy, the multigravidas pictured themselves and their babies in somewhat closer physical contact than did the primigravidas ($p = .06$, NS) and this did not significantly change as pregnancy advanced. However, between early and late pregnancy the primigravidas showed a significant increase ($p = .04$), so that by late pregnancy, the difference between groups was not significant (see Table 31).

The highly significant increase for Frequency of Thoughts among the multigravidas ($p .002$) had the effect of carrying the combined analysis ($n = 90$) resulting in a tendency to increase in the total sample ($p = .06$). Similarly, the tendency towards significance found for the postnatal picture in the combined analysis was due mainly to the significant increase among the primigravidas. Both groups showed somewhat more negative feeling as pregnancy advanced resulting in a tendency towards an increase in negative feeling for the total sample analysis ($p = .07$).

Overall, there were a relatively large number of tied scores. The number of ties for the total sample ($n=90$) ranged from 33-59 with a mean of 45.81 (51%). That is, on the average, approximately half the sample showed no change in attachment as pregnancy progressed. This was as true for the variables showing significant change as it was for the variables not showing significant change

(tests for the significance of the differences between these proportions were not significant). Therefore, the number of tied scores does not appear to be related to the levels of significance.

Some of the ties can be explained by the fact that a number of subjects were given minimum or maximum scores at the first interview which left no further room for a decrease or an increase at the late pregnancy interview. Consistency in the attitudes of women may also contribute to some extent. The average percentage of tied scores for the variables significant for change (55%) was significantly higher ($p = .05$) than both of the average percentages for variables showing significant differences in the first and second pregnancy comparisons (27% for early pregnancy and 33% for late pregnancy). This suggests that chance alone is not sufficient to explain the number of ties associated with measures of change.

In conclusion, the overall evidence for change in maternal attachment over the course of pregnancy is not impressive in this particular sample. Contrary to the findings reported in the literature (Bibring, 1961; Caplan, 1960; Leifer, 1980) the variables measuring affect (positive feeling, negative feeling and anxiety) did not show significant change, although there was a tendency found for negative feelings to increase. The findings of an increasingly clear image of the baby support those reported in Lumley's longitudinal study (Lumley, 1980b) of image of the fetus and the findings of Zeanah et al. (1985). As far as is known, there are no studies outside this research which have systematically measured

communication with the unborn child. The findings reported here provide evidence that this is one area where maternal attachment increases as pregnancy advances. For some variables, the increase in one group can largely be attributed to their relatively low scores in early pregnancy. This was the case for the increase shown by the primigravidas in a postnatal picture of mother and infant and for the increase shown by the multigravidas in perception of the appearance of the baby and in frequency of thoughts about the baby. The multigravida's previous experience may make it easier for her to visualize herself with an infant in the postnatal period and the novelty of pregnancy for the primigravida may explain the greater frequency of her thoughts about the baby during early pregnancy.

Overall, the findings suggest that consistency may be as important as change when describing the development of maternal attachment during pregnancy, at least between quickening and the third trimester. Significant change did not occur for the majority of the attachment measures used in the study and even when change was significant, a large number of the subjects remained constant. What can be said is that many women are very consistent in their attitudes during the course of pregnancy, but that where women do change, they show an increase in attachment to the unborn child.

Evidence for change may have been stronger if the early pregnancy measure had been obtained in the first trimester, prior to quickening. The majority of the subjects felt some sign of movement at the time of the first interview and the clinical literature

suggests that there is a sudden and rapid acceleration of maternal interest at this time. However, these same studies report that considerable change occurs again between the second and third trimester of pregnancy.

Another possibility is that change actually did occur but the measurement scale used in this study was not sensitive enough to pick it up. In addition, some subjects received the maximum possible score in early pregnancy meaning that any further increase in attachment could not be measured. Yet, other studies reporting significant change in women have used the same number of categories (or fewer) as used in this study. Another factor is that the criteria of requiring an increase on 6/16 attachment measures was more rigorous than the criteria used in many other studies. For example, if image of the baby had been the only measure of change, the conclusions would have clearly supported the hypothesis of an increase in maternal attachment:

3. The Additional Variables and Maternal Attachment

Two of the additional variables in the research, known or thought to influence maternal attachment during pregnancy were analysed for the 45 subjects of the main sample. These variables were Support from Spouse and Ultrasound.

Differences in maternal attachment were also examined for the three additional variables which had shown a significant difference between groups. Two of these variables were related to Employment

1) whether the subject was currently employed and 2) whether she planned employment following the birth of the baby. The third was Length of Marriage.

3.1 Support from Spouse

In the initial analysis of group differences (the primigravidas compared with the multigravidas), the multigravidas showed a tendency to be less satisfied with the degree emotional support received from their spouses ($p = .09$). When the two groups were combined and subdivided according to degree of satisfaction with support from their spouse, no significant differences were found for any of the maternal attachment variables. This is contrary to what is most commonly reported in the literature (Shereshefsky & Yarrow, 1973; Cohen, 1980; Benedek, 1952; Helper et al., 1968; Grimm & Venet, 1966; Westbrook, 1978b).

Measures of emotional support were not main variables in this study and less attention was given to eliciting detailed responses. It could be that a more thorough approach to questioning would better discriminate possible differences between subjects and that this in turn might yield greater differences between subjects for maternal attachment. Also, the majority of my subjects were middle to upper middle income individuals in relatively secure personal situations and this may have minimized variation among women. Nuckolls et al., (1972) found that measures of support analysed conjointly with measures of life change (stress)

were better predictors of illness onset than each were separately. Their outcome variable was physical complications of pregnancy but a conjoint analysis of this sort would be well worth applying to studies of pregnancy adjustment and/or maternal attachment during pregnancy.

3.2 Ultrasound

The findings provide some support for claims that ultrasound early in pregnancy may facilitate attachment to the expected infant. At 18-22 weeks of pregnancy, maternal viewing of the fetus was associated with a clearer perception of the appearance and personality of the baby, less negative feeling and more overall positive feeling about the baby (Global Score).

When assessed during late pregnancy, group differences for these particular measures were no longer significant but women who had received ultrasound in early pregnancy communicated more frequently with the baby and were less conflicted about the baby during late pregnancy than women who had not had this experience.

Fletcher and Evans (1983) have speculated about the possible medical, emotional and ethical implications of accelerating attachment to the fetus through ultrasound imaging. They suggest that ultrasound examination may result in fewer abortions and a greater number of desired pregnancies, particularly if there is risk of abnormality or the fetus is otherwise ambivalently regarded

(e.g., unwanted pregnancy). They do not conclude that these effects are necessarily in the best interests of women.

The subjects in this study did not have high risk pregnancies and the majority wanted and valued their pregnancy and the fetus. Some of the subjects said that they had initially been against ultrasound (either because it was unnatural or increased risk to the fetus) but all reacted positively to the experience itself and reported an increased awareness of the fetus as "a person".

These observations plus the findings of the study suggest that further investigation into this area would be of value. One important area for further study is the question of the longer term effects of ultrasound viewing on maternal attachment i.e., are the effects transitory or do they carry over into the postnatal period? The increased routine use of ultrasound in the obstetrical management of lower risk pregnancy should consider the question of whether accelerating the normal process of attachment to the fetus is necessarily beneficial to the expectant mother or to the maternal-infant relationship.

3.3 Employment and Postnatal Employment Plans

Working mothers and mothers who planned to work postnatally expressed significantly more anxiety about the health of their babies than did non-working mothers and mothers who did not plan to work postnatally. During late pregnancy, working women were also found to have more anxiety about themselves as mothers. This fits

with impressions of the subjects during the interview. In general, working mothers in the sample expressed satisfaction with their jobs and seldom wished to sacrifice this aspect of their lives. However in most cases, they were concerned about the effects of their day to day absence upon the child. For working mothers, this concern was immediate, for women planning to work, it was anticipated. Concerns were often linked with uncertainty about the quality of the substitute care that had been or was being arranged.

There were more primigravidas among the working mothers and working mothers were also older than non-working mothers. This group of working mothers then, contained a concentration of older primigravidas and the non-working mothers, a concentration of multigravidas. In the initial analysis of differences between primigravidas and multigravidas, the primigravidas were found to be significantly more anxious about the health of their babies. So far this has been discussed solely in terms of their relative lack of experience in caring for infants. Although first pregnancy in itself may be associated with high anxiety levels, the findings for the additional variables suggest that an interaction between first pregnancy, age and employment status might be a particularly stressful combination of circumstances, i.e., becoming a mother for the first time at a later age for women who are established in a job or career. In this regard, non-working mothers, more often multigravidas, are spared certain anxieties about their infants and themselves as mothers.

3.4 Length of Marriage

During late stages of pregnancy, subjects who had been married longer showed significantly more negative feeling about the baby than subjects who had been married for a shorter time. They also showed less overall positive feeling (Global Score). There were significantly more multigravidas in the longer married group, so it is impossible to separate the effects of gravidity and length of marriage. But in the main analysis between primigravidas and multigravidas, the multigravidas reported significantly more negative feeling (and conflict) about the baby at both early and late stages of pregnancy and the primigravidas were significantly more positive on the Global Score. Since the circumstances of longer marriage and later pregnancy are likely to exist together, it may be that these variables operate in conjunction to determine the greater negativity of the multigravida.

3.5 Age, Socioeconomic Status and Maternal Attachment

Age and socioeconomic status were controlled for the main analyses. The influence of these variables on maternal attachment was examined by dividing the sample, first for age and then separately for socioeconomic status, and applying the chi-square test for independent groups.

The findings in this particular sample do not indicate a strong relationship between age and maternal attachment. First,

significant differences were found for only 1/16 measures in early pregnancy and 2/16 measures in late pregnancy; this is very close to what would be expected by chance alone. Second, there were significant differences between groups in socioeconomic status, making it impossible to conclude that age alone determined the few differences that were found. The one variable that showed a consistent difference was greater negative feeling among the older gravidas.

It is difficult to know what to make of the results for socioeconomic status and maternal attachment. The number of significant findings was not large - 3/16 measures in both early and late pregnancy. Significant differences between groups were not found for the measures of affect - positive feeling, negative feeling, anxiety. However, there was a consistent suggestion of greater attachment in the lower socioeconomic group for measures of Image of the Baby and Communication with the Baby. Except for one measure - Affect associated with postnatal picture - all significant findings are in the direction of higher attachment scores in the lower socioeconomic group.

These findings do not provide support for the argument that lower socioeconomic status may be one factor contributing to greater negative feeling about motherhood. However, the subjects for this study were from higher socioeconomic levels than pregnant women in the general population and than many of the samples in other studies. The comparisons were between a middle to lower-middle

income group and an upper-middle to high income group and the scarcity of lower income women may have biased the results in favour of more positive attitudes overall. The findings, if anything, add support to the view of Cohen (1966) and others (Jarrahi-Zadeh et al., 1969; Kaij et al., 1967) that social and economic factors alone are not sufficient to explain the apparent increase in negative attitudes with the birth of additional children. One would need to control for the possible confounding influence of age before conclusions about these effects could be made.

My findings of greater attachment to the baby in the lower socioeconomic group were confined to certain variables - Image of the Baby and Communication with the Baby; as far as is known, there are no other studies that examine the influence of socioeconomic status on measures comparable to these. Age was again a possible confounding influence in these comparisons.

4. Conclusions

Of the attachment variables, the measures of feelings about the baby best discriminated differences between women in a first pregnancy and women in a second pregnancy. Previous observations that pregnancy is particularly stressful for the primigravida were supported by findings of greater anxiety about the expected infant. Women in a second pregnancy experienced less anxiety about the infant but as much anxiety about themselves as mothers and significantly more negative feeling and conflict about motherhood.

There were also similarities between the groups indicating that in many respects primigravidas and multigravidas invest equally in a relationship with their unborn child.

An examination of the additional variables in the research added information to the findings of differences between women. Later pregnancy and longer marriage both predicted greater negative feelings among women and it may be that these variables operate together to influence the greater negativity of the multigravida. Anxiety about the welfare of the expected infant was particularly evident in older primigravidas who were employed and/or planning employment.

Overall these findings suggest that both advantages and disadvantages accompany the various role decisions of adult women: 1) maintaining an adult role outside the home is accompanied by less negative feeling about motherhood and greater anxiety about the well-being of the infant; 2) women in a second pregnancy and particularly those who do not work outside the home, experience less anxiety about their infants but greater dissatisfaction about motherhood. Although this research did not include a measure of subjects' self-esteem, it seems reasonable to assume that feelings towards the baby and feelings about motherhood to some extent reflect the self-esteem of women. In this respect, the findings provide indirect support for claims that self-esteem is increasingly lowered among adult women who progressively confine their role to that of motherhood (Rossi, 1968; Cohen, 1968; Jenner, 1969; Jarrahi-

Zedei, 1969; Doty, 1967; Kaij et al., 1967, Jessner, 1970; Larson, 1966, Westbrook, 1978a).

It would be fruitful to study women in a third or fourth pregnancy to examine whether the effects found here would be even more pronounced. The additional confounding effects in an expanded study would need to be considered; for example, the influence of age differences between women would be more difficult to control with greater differences in parity between women. Yet too strict an isolation of differences in parity from the life circumstances that normally accompany such differences results in artificial and oversimplified descriptions of what are a complex set of events and relationships. Some balance between adequate controls for confounding influences and a meaningful inclusion of relevant life circumstances seems to be the most fruitful approach.

Statistical methods such as the analysis of variance or multiple regression techniques might clarify the relative importance of some of the major variables determining maternal attachment. Consideration should also be given to reducing the number of dependent variables. This would concentrate measurement in the areas that best discriminate between women, e.g., differences in affect, and would also reduce the probability of significant findings occurring by chance alone.

A profitable direction for further research would be to include follow-up measures of mother-infant interaction after birth. This would yield information about whether the patterns of maternal

attachment found in this research are characteristic only of pregnancy or are carried over and expressed during the postnatal period. Findings of continuity would provide further support for the idea that pregnancy is the most meaningful place to study the beginnings of a mother's attachment to her infant and might shed further light on questions such as the effects of birth order on the development of children and the effects of parity on the development and self-esteem of women in their adult years.

CHAPTER SIX

THE LOSS SAMPLE

1. Results

The findings for the loss sample will be described as follows: first, differences between the two groups at early and at late pregnancy are reported; second, change in maternal attachment is described, and finally; the two groups of multigravidas are compared for the variables which could obscure the outcome of tests of the main hypotheses.

The Wilcoxon Matched-Pairs Signed-Ranks Test was used to analyse group differences for the main variables, and where appropriate, group differences for the additional variables. When variables had only 2 categories, either the Sign Test or the McNemar Test was used. One-tailed tests of significance were applied to the analyses of the main variables because the direction of expected differences was predicted. Two-tailed tests of significance were used for analyses which gave significant results in the opposite direction to that predicted; and for the additional variables because the direction of differences was not predicted.

A scoring modification was again carried out for the measures Affect and Global Score. However, this sample differed from the main sample because the category "neutral" was often used by the subjects with previous loss. Thus, for both of these

measures, the category "Neutral" was retained and the other three categories were collapsed into a category named "Responsive".

Early and late pregnancy differences in attachment were also examined with a larger sample. For this analysis, the loss subjects (n=12) were compared to the total main sample multigravidas (n=45). This was done to see whether increasing the power of the statistical testing would add information to the findings obtained for the smaller sample (Cohen, 1977).

The Wilcoxon Test could not be used for the larger sample comparisons because the groups were not individually matched for age and socioeconomic status. The chi-square test for independent groups was used, with corrections for small numbers when necessary. When expected cell frequencies were too small, adjacent scoring categories were combined to meet the requirements for a valid chi-square test.

The number of tied scores within pairs is shown in the accompanying tables. In some cases, the numbers were large; however, the mean number of ties was not significantly higher where a significant result was obtained from the Wilcoxon.

The variables which gave significant results were compared by examining the means, the medians, the standard deviations and the ranges; in most cases the hypothesized differences were due to a difference in central tendency but in several cases, the standard deviations were different by a factor of more than 1.5. This was due to an uneven distribution of scores in the loss subjects. These variables were: Positive Feeling in the early

pregnancy comparisons, Proximity, Affect and Intensity of Thoughts and Anxiety-Health of Baby in the late pregnancy comparisons, and Frequency of Thoughts in the analysis of change in attachment. In these cases, the interpretation of significance due only to a difference in central tendency must be treated conservatively.

1.1 Comparisons between the Loss Group and the Control Group

The fourth hypothesis states that multigravidas who had lost a child in an earlier pregnancy will show less attachment to the unborn child than multigravidas who had not had a previous loss. One variable - Anxiety-Health of Baby - was excluded from this hypothesis. The fifth hypothesis states that anxiety about the health of the baby will be greater among women who had previously lost a child. These two hypotheses were tested for both early and late stages of pregnancy.

1.1.1 Early Pregnancy Comparisons

Image of the Baby

The differences between groups in the perception of the Sex of the Baby, the Appearance of the Baby and the Personality of the Baby were not significant (Table 38).

Table 38 Early pregnancy comparisons of the multigravidas who have lost a child with the control multigravidas

| Variable | Wilcoxon Test (n=12) | | | | | | |
|---------------------------------|----------------------|--------|------|--------|------|------|-------|
| | Illes | -Ranks | Mean | +Ranks | Mean | Z | R |
| <u>Image of the Baby</u> | | | | | | | |
| Sex of the Baby | 5 | 6 | 3.83 | 1 | 5.00 | 1.52 | .12 |
| Appearance of the Baby | 6 | 4 | 3.50 | 2 | 3.50 | .73 | .46 |
| Personality of the Baby | 3 | 4 | 4.00 | 5 | 5.80 | .77 | .22 |
| <u>Postnatal Picture</u> | | | | | | | |
| Proximity | 3 | 3 | 3.17 | 6 | 5.92 | 1.54 | .06 |
| Affect (Sign Test) | 8 | 0 | | 5 | | | .06 |
| <u>Communication with Baby</u> | | | | | | | |
| Verbal Communication | 1 | 3 | 5.50 | 8 | 6.19 | 1.47 | .07 |
| Tactile Communication | 3 | 3 | 5.17 | 6 | 4.92 | .83 | .20 |
| <u>Thoughts about Baby</u> | | | | | | | |
| Frequency of Thoughts | 2 | 6 | 5.17 | 4 | 6.00 | .36 | .36 |
| Duration of Thoughts | 6 | 3 | 4.00 | 3 | 3.00 | .31 | .38 |
| Intensity of Thoughts | 2 | 8 | 5.63 | 2 | 5.00 | 1.78 | .08 |
| <u>Positive Feeling</u> | | | | | | | |
| Pos. Feeling (Sign Test) | 3 | 3 | 3.50 | 6 | 5.75 | 1.42 | .08 |
| <u>Negative Feeling</u> | | | | | | | |
| Neg. Feeling (Sign Test) | 4 | 1 | 5.50 | 7 | 4.36 | 1.75 | .03* |
| <u>Conflict</u> | | | | | | | |
| Conflict (Sign Test) | 4 | 1 | 4.50 | 7 | 3.92 | 1.61 | .04* |
| <u>Anxiety-Health of Baby</u> | | | | | | | |
| Anxiety-Health of Baby | 5 | 1 | 4.00 | 6 | .00 | 2.37 | .05* |
| <u>Anxiety-Self as Mother</u> | | | | | | | |
| Anxiety-Self as Mother | 5 | 7 | 4.00 | 0 | 5.00 | 2.37 | .009* |
| <u>Global Score (Sign Test)</u> | | | | | | | |
| Global Score (Sign Test) | 2 | 4 | 6.25 | 6 | | .26 | .40 |
| | 9 | 0 | | 3 | | | .12 |

* statistically significant

Postnatal Picture

Women who had previously lost a baby tended to picture themselves in less close physical Proximity to their babies than women without loss ($z = 1.54$, $p = .06$). They were also less able to report feelings of any sort associated with this postnatal picture, but the difference between groups was not statistically significant (Sign Test, $p = .06$).

Communication with the Baby

There was a tendency for the subjects with loss to report less Verbal Communication with their babies than the comparison multigravidas ($z = 1.47$, $p = .07$). The difference between groups in frequency of Tactile Communication was not significant (Table 38).

Thoughts about the Baby

No significant differences were found during early pregnancy for Frequency, Duration or Intensity of Thoughts about the baby (see Table 38).

Positive Feeling

A tendency was found for the subjects with previous loss to have less Positive Feeling about the baby than the subjects who had not experienced loss ($z = 1.42$, $p = .08$). When the two lowest scoring categories were collapsed into "little or no" positive feeling, and the two highest categories into "clear"

positive feeling, the difference between groups was significant (Sign Test, $p = .03$).

Negative Feeling

The subjects with previous loss reported significantly less Negative Feeling about their babies than the comparison group ($z = 1.75$, $p = .04$).

Conflict

The difference between groups for Conflict about the coming baby was significant ($z = 1.61$, $p = .05$) with the loss subjects reporting significantly less conflict than the control mothers.

Anxiety-Health of Baby

Women who had previously lost a baby reported significantly more anxiety about the health of their babies than women who had not had a loss ($z = 2.37$, $p = .009$).

Anxiety-Self as Mother

The difference between the groups for this variable was not significant (Table 38).

Global Score

The differences between groups for the Global Score ("neutral" and "responsive") was not significant (Table 38).

1.1.2 Late Pregnancy Comparisons

Image of the Baby:

During late pregnancy the mothers with previous loss reported a clear perception of the Sex of the Baby significantly more often than the comparison mothers ($z = 2.02$, $p = .04$, two-tailed test). A tendency was found for the mothers with loss to perceive the Personality of the Baby less clearly than the mothers without loss but this difference did not reach significance ($z = 1.36$, $p = .09$). The difference between groups for Appearance of the Baby was not significant (Table 39).

Postnatal Picture:

Significant differences were found for both Proximity and Affect in a picture of mother and baby together following the birth. The subjects who had lost a baby pictured themselves as being less close to the baby ($z = 2.80$, $p = .003$) and they also reported less affect associated with this image ($p = .03$).

Communication with the Baby:

The subjects with previous loss tended to report less frequent Verbal Communication than the comparison multigravidas but the difference did not reach significance ($z = 1.42$, $p = .08$). The difference between groups in Tactile Communication was not significant (Table 39).

Table 39 Late pregnancy comparisons of the multigravidas who have lost a child with the control multigravidas

| Variable | | Wilcoxon Test (n=12) | | | |
|---------------------------------|---|----------------------|------|--------|-------|
| | | U | Mean | +Ranks | Mean |
| <u>Image of the Baby</u> | 7 | 5 | 3.00 | 0 | .00 |
| <u>Sex of the Baby</u> | 7 | 3 | 3.33 | 2 | 2.50 |
| <u>Appearance of the Baby</u> | 6 | 2 | 2.00 | 4 | 4.25 |
| <u>Personality of the Baby</u> | | | | | |
| | | | | | 1.36 |
| | | | | | .09 |
| <u>Postnatal Picture</u> | | | | | |
| <u>Proximity</u> | 2 | 0 | .00 | 10 | 5.50 |
| <u>Affect (Sign Test)</u> | 7 | 0 | | 5 | |
| | | | | | 2.80 |
| | | | | | .003* |
| | | | | | .03* |
| <u>Communication with Baby</u> | | | | | |
| <u>Verbal Communication</u> | 3 | 3 | 3.50 | 6 | 5.75 |
| <u>Tactile Communication</u> | 4 | 4 | 3.50 | 4 | 5.50 |
| | | | | | 1.42 |
| | | | | | .08 |
| | | | | | .56 |
| | | | | | .29 |
| <u>Thoughts about Baby</u> | | | | | |
| <u>Frequency of Thoughts</u> | 6 | 5 | 3.70 | 1 | 2.50 |
| <u>Duration of Thoughts</u> | 3 | 5 | 4.40 | 4 | 5.75 |
| <u>Intensity of Thoughts</u> | 4 | 7 | 4.50 | 1 | 4.50 |
| | | | | | 1.89 |
| | | | | | .06 |
| <u>Positive Feeling</u> | 1 | 3 | 5.00 | 8 | 6.38 |
| <u>Pos. Feeling (Sign Test)</u> | 1 | 2 | | 9 | |
| | | | | | 1.60 |
| | | | | | .06 |
| <u>Negative Feeling</u> | 2 | 2 | | 8 | |
| | | | | | 1.73 |
| <u>Conflict</u> | 3 | 3 | | 6 | |
| | | | | | 1.36 |
| | | | | | .09 |
| <u>Anxiety-Health of Baby</u> | 2 | 10 | 5.50 | 0 | .00 |
| <u>Anxiety-Self as Mother</u> | 2 | 4 | 6.25 | 6 | 5.00 |
| <u>Global Score (Sign Test)</u> | 8 | 1 | | 3 | |
| | | | | | 2.80 |
| | | | | | .003* |
| | | | | | .26 |
| | | | | | .40 |
| | | | | | .31 |

* statistically significant

Thoughts about the Baby:

Thoughts about the baby tended to be more intense ($z = 1.89$, $p = .06$, two-tailed test) among women who had previously lost a baby. The differences between groups in Frequency and Duration of Thoughts were not significant (Table 39).

Positive Feeling:

Based on the original scoring breakdown, the difference between groups in Positive Feeling about the baby during late pregnancy almost reached significance ($z = 1.60$, $p = .06$) with less positive feeling being reported by women who had previously lost a baby. When the groups were compared using the two highest and two lowest scoring categories ("little or no" and "clear"), the difference was clearly significant (Sign Test, $p = .02$).

Negative Feeling:

The subjects with previous loss reported significantly less Negative Feeling about the coming baby than the control subjects ($z = 1.73$, $p = .04$).

Conflict:

A tendency was found for subjects with loss to have less Conflict about the baby but this difference did not reach significance ($z = 1.36$, $p = .09$).

Anxiety-Health of Baby:

The subjects with previous loss were significantly more anxious about the health of the expected infant than the comparison multigravidas ($z = 2.80$, $p = .003$).

Anxiety-Self as Mother:

The difference between groups for this variable was not significant (Table 39).

Global Score:

The difference between groups in the Global Score ("neutral" and "responsive") was also not significant (Table 39).

1.1.3 The Loss Group (n=12) Compared with the Total Main Sample Multigravidas (n=45)

In most cases, the results based on the larger sample size confirmed the differences reported for the smaller matched samples. For some variables, significant differences between groups were found which did not occur for the smaller sample comparisons. The groups for the large sample comparisons did not significantly differ for either age or SES. The Wilcoxon Test (matched pairs for the small sample comparisons) and the chi-square test (independent groups for the large sample comparisons) use different information about the samples but have comparable statistical power. One-tailed tests of significance were used where differences were in the predicted direction; otherwise, two-tailed tests were applied. Table 40 compares the

results of the two analyses for early pregnancy and Table 41 compares the results for late pregnancy.

1.1.4 Summary of Group Differences

The prediction was made that women who had lost a baby in a previous pregnancy would show less attachment to the unborn child on all measures of attachment except for: Anxiety-Health Baby (Hypothesis 4). It was predicted that anxiety about the health of the baby would be greater among women with a history of loss (Hypothesis 5).

Support for the fourth hypothesis required significant group differences in the same direction for 5/15 variables. Support for the fifth hypothesis required significant group differences for 1/1 variable.

During early pregnancy women who had experienced previous loss showed significantly less attachment to the coming baby on 3/15 measures. They reported significantly less Positive Feeling and significantly less Negative Feeling and Conflict about their babies. None of these findings were significant at $p = .02$ or less.

Several trends were found for the early pregnancy results. The subjects with previous loss were less able to picture themselves and the baby in close physical Proximity following birth and were less likely to report Affect of any sort associated with this picture. They also spoke or sang to the baby less often than women who had not had a loss.

Table 40 Early pregnancy comparisons between the small and the large loss samples

| <u>Variable</u> | <u>Small sample</u> (Wilcoxon/Sign Test) | <u>Large sample</u> (Chi-square test) |
|------------------------------------|---|--|
| <u>Image of the Baby</u> | | |
| Sex of the Baby | p = .12 | p = .006* (M<L) |
| Appearance of the Baby | p = .46 | p = .96 |
| Personality of the Baby | p = .22 | p = .14 |
| <u>Postnatal Picture</u> | | |
| Proximity | p = .06 | p = .002* (L<M) |
| Affect | p = .06 | p = .009* (L<M) |
| <u>Communication with the Baby</u> | | |
| Verbal Communication | p = .07 | p = .37 |
| Tactile Communication | p = .20 | p = .37 |
| <u>Thoughts about the Baby</u> | | |
| Frequency of Thoughts | p = .36 | p = .50 |
| Duration of Thoughts | p = .38 | p = .09 |
| Intensity of Thoughts | p = .08 | p = .0002* (M<L) |
| Positive Feeling | p = .03* | p = .04* (L<M) |
| Negative Feeling | p = .04* | p = .05* (L<M) |
| Conflict | p = .05* | p = .04* (L<M) |
| Anxiety-Health of Baby | p = .009* | p = .0001* (M<L) |
| Anxiety-Self as Mother | p = .40 | p = .50 |
| Global Score | p = .12 | p = .02* (L<M) |

*statistically significant

L=loss sample, M=comparison multigravidas

Table 41 Late pregnancy comparisons between the small and the large loss samples

| <u>Variable</u> | <u>Small sample</u> (Wilcoxon/Sign-Test) | <u>Large sample</u> (Chi-square test) |
|------------------------------------|---|--|
| <u>Image of the Baby</u> | | |
| Sex of the Baby | p = .04* | p = .06 (M<L) |
| Appearance of the Baby | p = .50 | p = .98 |
| Personality of the Baby | p = .09 | p = .06 |
| <u>Postnatal Picture</u> | | |
| Proximity | p = .003* | p = .002* (L<M) |
| Affect | p = .03* | p = .0003* (L<M) |
| <u>Communication with the Baby</u> | | |
| Verbal Communication | p = .88 | p = .48 |
| Tactile Communication | p = .29 | p = .44 |
| <u>Thoughts about the Baby</u> | | |
| Frequency of Thoughts | p = .10 | p = .14 |
| Duration of Thoughts | p = .96 | p = .44 |
| Intensity of Thoughts | p = .06 | p = .001* (M<L) |
| <u>Positive Feeling</u> | p = .03* | p = .008* (L<M) |
| <u>Negative Feeling</u> | p = .04* | p = .05* (L<M) |
| <u>Conflict</u> | p = .09 | p = .26 |
| <u>Anxiety-Health of Baby</u> | p = .009* | p > .001* (M<L) |
| <u>Anxiety-Self as Mother</u> | p = .40 | p = .50 |
| <u>Global Score</u> | p = .31 | p = .10 |

*statistically significant

L=loss sample, M=comparison multigravidas

During late pregnancy, the differences between groups were more pronounced but still not sufficient to reject a global null hypothesis of no differences. The subjects who had previously lost an infant were found to be significantly less attached to the expected infant on 4/15 variables. Only one of these measures was significant $p = .02$ or less. As predicted, women with previous loss were less able to picture themselves and the infant in close physical Proximity following birth and were less likely to report Affect associated with this picture. As in early pregnancy, women with loss reported significantly less Positive Feeling and significantly less Negative Feeling about the coming baby. Contrary to the prediction of lesser attachment, the women with previous loss reported a clearer image of the Sex of the Baby than the comparison women.

Tendencies were found for the subjects with previous loss to talk or sing less frequently to the baby and to experience less Conflict about the baby. Image of the Personality of the Baby tended to be less clear among the subjects with previous loss. A tendency was found for the loss subjects to experience greater intensity of thoughts about the coming baby.

The prediction that anxiety about the health of the baby would be greater among women with previous loss (Hypothesis 5) was confirmed by the findings. During both early and late stages of pregnancy, the differences between groups were highly significant.

The comparisons of the loss group with the larger sample

of multigravidas in most cases highlighted the significant findings reported above.

1.2 Change in Attachment

The sixth hypothesis states that women with previous loss will show a lesser increase in attachment as pregnancy progressed than comparison women. The findings for the ten attachment variables were as follows:

Image of the Baby:

Among the subjects with previous loss the change in attachment from early to late pregnancy was not significant for any of the items measuring Image of the Baby (Table 42). This was also the case for the control multigravidas (Table 43).

Postnatal Picture:

During late pregnancy, the control multigravidas pictured themselves closer to the baby following birth than they had during early pregnancy ($z = 2.02$, $p = .02$). The difference between early and late measures for subjects with loss was not significant (Table 42).

Change in Affect associated with the postnatal picture was not significant for either group (Table 42 and 43).

Table 42 Change in attachment from early to late pregnancy for the multigravidas who have lost a child

| <u>Variable</u> | <u>Milcoxon Test (n=12)</u> | | | | |
|---------------------------------|-----------------------------|---------------|-------------|---------------|-------------|
| | <u>iles</u> | <u>-Ranks</u> | <u>Mean</u> | <u>+Ranks</u> | <u>Mean</u> |
| <u>Image of the Baby</u> | | | | | |
| Sex of the Baby | 10 | 1 | 1.00 | 1 | 2.00 |
| Appearance of the Baby | 7 | 1 | 3.00 | 4 | 3.00 |
| Personality of the Baby | 8 | 1 | 2.50 | 3 | 2.50 |
| | | | | | |
| <u>Postnatal Picture</u> | | | | | |
| Proximity | 5 | 4 | 4.38 | 3 | 3.50 |
| Affect (Sign Test) | 7 | 3 | | 2 | |
| | | | | | |
| <u>Communication with Baby</u> | | | | | |
| Verbal Communication | 7 | 1 | 2.00 | 4 | 3.25 |
| Tactile Communication | 4 | 2 | | 6 | |
| | | | | | |
| <u>Thoughts about Baby</u> | | | | | |
| Frequency of Thoughts | 5 | 0 | .00 | 7 | 4.00 |
| Duration of Thoughts | 3 | 5 | 4.80 | 4 | 5.25 |
| Intensity of Thoughts | 9 | 1 | 1.00 | 2 | 2.50 |
| | | | | | |
| <u>Positive Feeling</u> | 6 | 4 | 3.50 | 2 | 3.50 |
| <u>Negative Feeling</u> | 9 | 0 | .00 | 3 | 2.00 |
| <u>Conflict</u> | 8 | 1 | 2.50 | 3 | 2.50 |
| <u>Anxiety-Health of Baby</u> | 9 | 1 | 1.50 | 2 | 2.25 |
| <u>Anxiety-Self as Mother</u> | 4 | 3 | 4.83 | 5 | 4.30 |
| <u>Global Score (Sign Test)</u> | 10 | 1 | | 1 | |
| | | | | | |

* statistically significant

Table 43 Change in attachment from early to late pregnancy
for the control multigravidas

| <u>Variable</u> | | <u>Wilcoxon Test (n=12)</u> | | | | |
|---------------------------------|-------------|-----------------------------|-------------|---------------|-------------|----------|
| <u>Image of the Baby</u> | <u>ILES</u> | <u>-Ranks</u> | <u>Mean</u> | <u>+Ranks</u> | <u>Mean</u> | <u>Z</u> |
| Sex of the Baby | 4 | 3 | 4.83 | 5 | 4.30 | .49 |
| Appearance of the Baby | 5 | 2 | 4.00 | 5 | 4.00 | 1.01 |
| Personality of the Baby | 2 | 3 | 6.17 | 7 | 6.17 | .92 |
| | | | | | | .18 |
| <u>Postnatal Picture</u> | | | | | | |
| Proximity | 7 | 0 | .00 | 5 | 3.00 | 2.02 |
| Affect (Sign Test) | 12 | 0 | | 0 | | .02* |
| | | | | | | .50 |
| <u>Communication with Baby</u> | | | | | | |
| Verbal Communication | 6 | 2 | 3.50 | 4 | 3.50 | .73 |
| Tactile Communication | 8 | 0 | .00 | 4 | 2.50 | 1.83 |
| | | | | | | .03* |
| <u>Thoughts about Baby</u> | | | | | | |
| Frequency of Thoughts | 5 | 2 | 2.00 | 5 | 4.80 | 1.70 |
| Duration of Thoughts | 5 | 3 | 3.50 | 4 | 4.38 | .59 |
| Intensity of Thoughts | 6 | 3 | 2.50 | 3 | 4.50 | .63 |
| | | | | | | .04* |
| <u>Positive Feeling</u> | | | | | | |
| | 5 | 4 | 4.00 | 3 | 4.00 | .34 |
| <u>Negative Feeling</u> | | | | | | |
| | 5 | 3 | 3.00 | 4 | 4.75 | .85 |
| <u>Conflict</u> | | | | | | |
| | 4 | 3 | 4.00 | 5 | 4.80 | .84 |
| <u>Anxiety-Health of Baby</u> | | | | | | |
| | 3 | 4 | 6.13 | 5 | 4.10 | .24 |
| <u>Anxiety-Self as Mother</u> | | | | | | |
| | 5 | 3 | 3.50 | 4 | 4.38 | .59 |
| <u>Global Score (Sign Test)</u> | | | | | | |
| | 11 | 1 | | 0 | | .50 |

* statistically significant

Communication with the Baby:

Among subjects who had previously lost a baby, tendencies for both greater Verbal and greater Tactile Communication with the baby were found as pregnancy progressed but these differences failed to reach significance (see Table 42). The increase in Tactile Communication shown by the control multigravidas was significant ($z = 1.83$; $p = .03$) but the difference for Verbal Communication was not significant (Table 43).

Thoughts about the Baby:

The subjects with previous loss showed a significant increase in Frequency of Thoughts about the baby during late pregnancy ($z = 2.37$, $p = .009$). An increase was also shown by the control group ($z = 1.70$, $p = .04$). The differences between early and late pregnancy for Duration and Intensity of Thoughts were not significant in either group (Tables 42 and 43).

Positive Feeling:

Change in Positive Feeling about the baby was not significant for either group (Table 42 and Table 43).

Negative Feeling:

By late pregnancy, there was a significant increase in Negative Feeling about the baby among subjects with previous loss ($z = 1.60$, $p = .05$). There was also an increase for the control group but the difference was not significant (Table 43).

Conflict:

Although Conflict tended to increase by late pregnancy in both groups, the differences did not reach significance (Tables 42 and 43).

Anxiety-Health of Baby:

Neither group showed a significant change in Anxiety-Health of Baby (Tables 42 and 43).

Anxiety-Self as Mother:

There was also no significant change in either group for Anxiety-Self as Mother (Tables 42 and 43).

Global Score:

No significant change was found in either group for the Global Score (Tables 42 and 43).

1.2.1 Summary of Change in Attachment

Of the 16 measures of maternal attachment, the subjects with previous loss showed a significant increase on two measures: (1) Negative Feeling and (2) Frequency of Thoughts about the baby. Women without a history of loss showed a significant increase on three measures: (1) Proximity in a postnatal picture of mother and baby, (2) Tactile Communication with the baby and (3) Frequency of Thoughts about the baby.

Among the subjects with loss, a tendency towards an

increase was found for both Verbal and Tactile Communication with the baby and among control subjects for Verbal Communication with the baby.

Hypothesis 6 states that women with previous loss will show a lesser increase in attachment than women who had not had a loss. In both groups of subjects, the number of significant increases was very small. In neither group did the number of increases come close to that required for rejecting the null hypothesis of no change (an increase for 6/16 variables was required). It was concluded that the evidence for change in this sample was not strong enough to proceed with an analysis of the relative group differences (Hypothesis 6).

1.3 Possibly Confounding Variables

There were no significant differences between the subjects with previous loss and the control subjects for:

- 1) Quickening - has the subject felt movement?
- 2) Planned Pregnancy - was the pregnancy planned or unplanned?
- 3) Difficulty Conceiving - was there any difficulty conceiving?
- 4) Complications of Pregnancy - were there any physical complications of pregnancy?
- 5) Support from Others - degree of emotional support from others (family, friends) during the course of pregnancy.
- 6) Stress during Pregnancy - occurrence of stressful life

events during the course of pregnancy.

It can be assumed that any differences between the two groups in attachment are not due to differing effects of any of these variables.

Significant differences between the subjects with the loss and the control multigravidas were found for:

- 1) Ultrasound - has the subject had ultrasound?
- 2) Support from Spouse - degree of emotional support from spouse during the course of pregnancy.
- 3) Employment - is the subject employed?

The subjects who had lost a baby during a first pregnancy received ultrasound significantly more often than control subjects during their second pregnancy, i.e., the pregnancy under study ($z = 2.803$, $p = .005$). They also reported receiving significantly more emotional support from their spouses than women who had not lost a baby ($z = 2.52$, $p = .01$). Finally, the subjects who had lost a baby were significantly more often employed during their second pregnancy ($z = 2.07$, $p = .04$).

2. Discussion

Group comparisons in attachment (Hypothesis 4 & 5) are considered, followed by a discussion of change in attachment (Hypothesis 6). Suggestions are then made about the management of women who have experienced stillbirth or neonatal death, and the discussion concludes with recommendations for further research.

2.1 Comparisons between the Loss Group and the Control Group

The fourth hypothesis states that women with previous loss will show less attachment to the expected infant than women without a history of loss.

When all measures of attachment were taken together (15 measures), the findings were not strong enough to reject a global null hypothesis of no difference. However, there was consistency in the findings of lesser attachment for two measures - Positive Feeling and Negative Feeling about the baby. These measures differentiated between groups in the predicted direction at both early and late stages of pregnancy and this was confirmed by the larger sample analysis. The significant difference between groups for Positive Feeling during early pregnancy was not only due to a difference in central tendency. However, during late pregnancy, a difference in central tendency was the only difference observed. The significant findings are discussed in detail below.

2.1.1 Positive and Negative Feeling

The mothers who had lost an infant in a previous pregnancy consciously avoided investing in a relationship with the baby as a protection from the possibility of another disappointment. The following quotes from the interview material illustrate this theme:

Early pregnancy: "I can't feel the same love, I don't want to think of it as a baby, as mine. We don't talk about it as much because when we do, it is apprehension talk. I'm always afraid of losing it."

Late pregnancy: "Every once in a while I let myself think about what life will be like with this baby, but then I stop myself. I'm afraid of letting myself go because of the pain and the hurt."

Early pregnancy: "I deliberately try to avoid getting attached to this baby in case I lose it. The only thing is I cry when I think of it dying so I figure I'm getting attached to it anyway."

During early pregnancy, news of the pregnancy was withheld from friends and certain family members who ordinarily would have been told. During late pregnancy, relatively few preparations for the baby's arrival had been made; clothes had not been purchased, the nursery had not been readied and names had not been chosen. The mothers expressed a reluctance to put themselves ahead in time, to imagine a future with a child. Some said that although they held their feelings back, "the love was there" and one or two admitted that "they had grown to love the baby in spite of themselves."

Late pregnancy: "I'm still very much afraid but I'm becoming more positive. I don't want to deprive him but I don't want to let myself get too close."

Late pregnancy: "I sometimes let myself think of the three of us together. I don't look too far ahead, just as a baby, the way it should be."

Mothers with previous loss expressed less negative feeling than control mothers in a variety of ways. Some described shifts in their attitudes about motherhood, for example: "I used to think I could never stand just staying home and looking after kids, but all that has changed now". Many now found the idea of being a working mother unacceptable. One subject said that when she heard other women complain about night feedings she thought - "Oh...to have that problem...". Some reported that they were far less concerned about the possibility of the baby being homely or less than brilliant: "healthy and heterosexual, that's all that matters". One subject said that her views about giving birth to a handicapped child had changed. During her first pregnancy, she thought that she would have probably "given it away" whereas she now felt "lucky to have a child at all".

These mothers were clearly less concerned with the disadvantages of motherhood and they also reported fewer positive feelings about the expected infant. One interpretation of these findings would be along the lines suggested by Lewis (1977) - that bereaved mothers avoid the usual ambivalent feelings about an unborn child because of anxiety aroused by the stronger ambivalence associated with mourning the lost infant.

What is not clear from the results of this research is whether these prenatal attitudes place these mothers at a disadvantage following the birth of the next baby. It is possible that the formation of a relationship with the next baby is delayed

during pregnancy but fully emerges following birth when the mother is reassured about the baby's survival. However, clinical observation and follow-up studies of bereaved mothers suggest that this is not so. Lewis and Page (1978) observed that it is particularly following the birth of a subsequent live baby that these mothers, after a brief period of elation, become depressed and have difficulty in mothering. Evidence from follow-up studies of increased incidence of psychiatric disorder among bereaved women lends support to these observations (MacCarthy, 1969; Cullberg, 1972). Other investigators (Pozanski, 1972; Cain & Cain, 1964; MacCarthy, 1969) have suggested that viewing the child as special in some way, e.g., idealized, unusually vulnerable, is common among bereaved mothers and places the child at increased risk.

In this sample, there were at least two major differences in the recent experience of the loss subjects as compared with the control group of mothers: 1) they had and were still mourning the death of an infant and 2) they had not yet had the opportunity to actually care for an infant.

The absence of the experience of caring for an infant may serve to reinforce the avoidance of negative affects and/or enhance an idealized or special view of the expected infant in a subsequent pregnancy. This would in turn make it more difficult for women to come to grips with the feelings of frustration, anger and/or disappointment that inevitably arise in the course of looking after a young infant.

There were three additional variables which may have confounded the findings of lesser positive and negative feeling among the subjects with previous loss. Significant group differences were found for: Ultrasound, Support from Spouse and Employment. It seems unlikely that either a greater frequency of ultrasound or greater emotional support from the spouses of the loss subjects would result in reduced emotional investment in the coming child. If anything, it appears that these favourable experiences were not sufficiently reassuring to counteract the protective distancing that took place. Greater frequency of employment may well have contributed to the findings of lesser positive and negative feeling among the subjects with previous loss. The bereaved mothers clearly expressed a desire to keep themselves occupied. One explanation for this could be the absence of a competing interest - a child at home - but the mothers themselves viewed employment as one important means of maintaining distance from painful memories and immediate anxieties.

There is another finding which may have confounded the differences between groups for the attachment variables; the length of time between first and second pregnancy was significantly shorter for women who had previously lost an infant ($p = .007$). This finding is in line with other reports in the literature (Dunlop, 1979; Wolff et al., 1970; Rowe et al., 1978; Cullberg, 1972) and the differences may well be one factor determining the group differences in attachment in this sample.

2.1.2 Similarities between the Loss Subjects and the Primigravidas

The subjects with previous loss have something in common with the primigravida group of the main sample. Both groups reported fewer negative feelings about the expected infant during pregnancy than their respective comparison groups. A direct comparison between the loss subjects and the primigravidas was not done and if such a resemblance were to be demonstrated, the reasons for the resemblance could still be quite different. What the two groups do share is that neither have been mothers beyond pregnancy or the very early postnatal period. Both have yet to deal with the realities of childcare. However, the loss subjects differ from the primigravidas in at least one important respect; they have the additional task of mourning a lost infant. If similarities between the two groups during pregnancy were demonstrated, these similarities might decrease or disappear during the postnatal period because the primigravida, not burdened by the additional task of mourning, may be in a better position to adapt to a realistic as opposed to an idealized view of herself and her infant.

2.1.3 Variables Significant at One Stage of Pregnancy

Certain measures differentiated between the groups in the predicted direction at only one stage of pregnancy. Some of these tests had significance levels at $p = .02$ or greater and/or are supported by significant findings from the larger sample analyses.

Contrary to the prediction of lesser attachment, mothers with previous loss were found to have greater attachment to the coming baby for one measure; they reported a clearer picture of the Sex of the Baby during late pregnancy than mothers without loss. This difference was also found in the large sample comparisons. This finding is probably explained by the significantly greater incidence of ultrasound among the mothers with loss. These mothers were not reporting fantasied sex of the coming infant - the majority of them knew the sex of the fetus by the time of the first interview.

2.1.4 Anxiety-Health of Baby

The prediction (Hypothesis 5) that women with a history of loss would be more anxious about the health of the expected infant than control mothers was unequivocally supported by the findings. The difference between groups was highly significant for both early and late pregnancy and for the large sample comparisons. The late pregnancy difference between groups was not only due to a difference in central tendency; no loss subjects scored in the categories "no" or "some" anxiety, resulting in noticable differences in the ranges and the standard deviations. However, the result was highly significant ($p = .003$). A possible confounding influence upon this difference is the significantly shorter time between first and second pregnancy found for the women with a history of previous loss. Of the additional variables, it seems unlikely that greater frequency of Ultrasound and greater Support from Spouse would

contribute to greater anxiety. Employment, associated with significant differences in attachment between women in the main sample, may have also influenced attachment in the loss sample.

The mothers with a history of loss were extremely guarded about the outcome of the pregnancy even when there had been no complications and when ultrasound and/or amniocentesis had provided evidence of a healthy fetus. Ultrasound examination was reassuring to some extent but did not account for the possibility that something might go wrong in the remaining months. The period at which the previous loss occurred was a particularly anxious time. Most subjects described taking things a day or a week at a time, refusing to let themselves count on anything, always prepared for something to go wrong.

The quality of the anxiety expressed by the subjects with loss is illustrated in the following quotations:

Early pregnancy: "I'm terrified. I worry that I'm not doing enough in the way of thinking and planning, but I hope it will come in time."

Early pregnancy: "What if it's got cancer...is mentally retarded...deaf...or only has one arm. I'm convinced that something is wrong. The question is... which one?" This mother had given birth to an infant with genetic anomalies.

Late pregnancy: "When I wake up in the morning, I say to the baby - well we've made it through another day. I do the same thing after work and again at night."

2.1.5 Grief

All women were still grieving the dead infant and most said that they always would. One mother, when asked if she could picture herself and the new baby together after the birth, responded: "all that I see is what I don't have". Memories of the lost baby appeared to be more immediate and more real than images of the expected baby. For example:

"I don't allow myself to feel too much because when I feel about this baby, feelings from the first baby invade...the sadness."

"I think about her every day and I often think things like, "Samantha would be walking now"."

To one extent or another, all women confused their feelings for the expected baby with their feelings for the dead baby. One mother, whose first baby was born and died in January, deliberately avoided a January delivery date with her next pregnancy. For three subjects, only a short time had elapsed between the first and second pregnancy and these subjects found it particularly difficult to separate the lost infant from the expected infant:

"When I think about this baby I mix it up with Jenna. I can't draw the line."

"Much of the time I forget this is a different baby. I want to replace the baby that was."

It seemed that these mothers were in some way still waiting for the arrival of the first baby. The first child in most cases had a name and the name was used during the interview. Some of the infants had been baptized. They described the baby as a person with an identity, whom they had loved and still loved. One mother was "mad at the baby for not coming through." Several subjects idealized the first baby and felt that the new baby could never be as perfect or as wonderful as the first.

In addition to anxiety about the coming baby and grief about the lost baby, my subjects were concerned about upsetting others:

"They (others) were so careful and so afraid to say anything."

When comfort was offered:

"People say - "good, this pregnancy is fine. It will help you forget what happened last time."

The subjects explained:

"I don't want to forget. This baby was part of my life, of me. I had a baby daughter and I lost her."

In referring to the birth of a stillborn baby as a "non-event", Bourne (1968) was specifically describing the reactions of the attending staff at the delivery. The accounts of my subjects suggest that the problem is even larger in scope. The current pregnancy as well as the first pregnancy was treated as a "non-event". Several subjects said that the usual overjoyed expressions

of enthusiasm from family and friends were missing, and although they understood that this was meant to protect, it dulled their own enthusiasm and made the pregnancy seem less real and less important.

Lewis (1976, 1978) has observed that stillbirths are seldom adequately mourned and that failure to mourn compounds the anxiety associated with a subsequent pregnancy and may contribute to severe problems with mothering of the new baby. He has further noted that psychotherapeutic efforts to assist bereaved women during a subsequent pregnancy have met with frustration (Lewis, E. 1977). Lewis found that women declined or failed most of the sessions offered to them and when they did come they tended to avoid psychotherapeutic work around mourning.

Observations of my subjects during the research interview to some extent support those of Lewis but there are some differences. These differences may contribute to developing strategies for clinical work with bereaved mothers.

2.1.6 Thoughts About Psychotherapy with Bereaved Mothers

The interview began with structured questions about the previous pregnancy and the circumstances of the loss.

The research subjects maintained control of their feelings, albeit with conspicuous effort. The attachment interview proper opened with the following question about the expected baby: "At this point in your pregnancy do you have a mental picture of the baby?" All subjects immediately reacted with relative degrees of alarm and

defensiveness, e.g., "You are invading my space." "You're coming too close." This defensiveness was either maintained throughout the interview (2 out of 12 subjects) but more often (10 out of 12 subjects) gave way to open expressions of sadness about the lost baby. Their responses contained descriptive detail and/or fantasy about the sex, appearance and personality of the lost baby. Some women were better at distinguishing between the two infants than others but all commented that this was difficult. Three women (pregnant again within 6 months of the loss) were explicit about their confusion and disturbed by it. The two subjects who did not break down during the interview focused primarily on attributes of and feelings towards the expected infant but it was difficult to know whether this was because they had more adequately mourned their lost baby or had more vehemently denied the loss. It was therefore difficult to speculate about whether these women would be at greater or lesser risk for problems in caring for their next infant.

Evidence that the interview may have had psychotherapeutic effects came by way of appreciative comments from the women's obstetricians following the research interview as well as from the women themselves. These effects occurred by accident rather than design. The interview was a research tool and procedure was confined to asking questions and recording answers. There was no interpretation, no reassurance and no advice given. Out of thirteen requests for participation in the project, there was only one refusal and there were no drop-outs. When initially approached, the

women were apprehensive but willing to participate and at the second interview they were apprehensive but eager to return.

Working within a research framework may elicit greater co-operation than offers of psychotherapeutic help for such women. It may be perceived as less intrusive and less threatening. The mothers may also have been motivated by their desire to help other women who have lost an infant. Another factor was that the research questions focused on ideas, fantasies and feelings about the expected infant rather than the lost infant. This more indirect approach may have minimized defensiveness. While communicating about the expected infant, most subjects could not help but get caught up in images and feelings of sadness about the lost baby.

2.2 Change in Attachment

The hypothesis of lesser change among women with a history of loss (Hypothesis 6) was not supported by the findings. Neither group showed strong enough evidence of change to warrant an analysis of the relative difference between groups. There are several possible reasons for this. Small sample size ($n=12$ in this sample) reduced the power of statistical testing and the numbers were made smaller still because tied scores were discarded from the analysis.


2.3 Conclusions

In this sample, as in the main sample, the measures of affect best discriminated between groups - in this case between women with

a history of previous loss from women who had given birth to a live and healthy infant. The consistency of this observation across quite different samples of women provides further support for the suggestion that future research might profitably focus on measurement of affective differences in maternal attachment.

It cannot be assumed that the differences found in this sample apply to maternal attitudes and feelings postnatally. The anxiety of the mothers with previous loss may well dissipate with the birth of a live, healthy infant and this may in turn elicit a full range of positive and negative feelings about the infant. However, it seems unlikely that a subsequent successful birth would completely eliminate the effects of such a loss. Reports from mothers themselves indicate that it is an event that is never forgotten. Reports from clinical observation and follow-up studies suggest that these women, particularly those who become pregnant again quickly, are more prone to develop psychiatric disorders and are likely to have difficulties mothering their next child.

There are several possible directions for further research in the area of infant loss and maternal attachment. Apart from studying the effects of loss upon the women themselves, there is evidence suggesting that the development of next-born child may be at risk. Questions about the timing and/or the context of the death of an infant would be worth examining: whether loss in a first pregnancy is more traumatic than loss in a later pregnancy; the effects of multiple losses upon women and subsequent children; the



possible differences between loss in early pregnancy compared with loss in later pregnancy; the effects of choice in the termination of pregnancy, e.g., spontaneous vs. therapeutic abortion.

The possibility that a research interview may facilitate the expression of grief and have therapeutic effects was discussed. This idea would need to be formally tested before conclusions could be reached. A project such as this would be feasible in a setting similar to the one used in this research. The design should include a control group of bereaved mothers. Both groups would receive their obstetrical care from the same group of obstetricians but in the case of the control group of mothers, the research interview would be omitted. Follow-up measures of maternal adaptation and/or measures of psychotherapeutic outcome would have to be devised.

The results of the study have implications for the obstetrical management of bereaved women. A history of stillbirth or neonatal death ensures that a subsequent pregnancy will be classified at medical risk. Evidence from this study and other research suggests that 1) psychological risk, specifically, failure to mourn should be included as a criterion for classifying pregnancy risk 2) such risk applies not only to the pregnant woman but to her next-born infant and 3) the opportunity to mourn a previously lost infant should be routinely provided for in the antenatal care of a pregnancy following stillbirth or neonatal death.

APPENDIX A

CONSENT FORM

Gale Adam, the principle investigator, has explained the project on maternal attachment to the unborn child to me. The purpose of the study is to compare the attachment of mother to baby in first and second pregnancies. It will also study the effects of loss of a first baby upon maternal attachment in a second pregnancy. I understand that as part of this study:

- 1) I will be interviewed on two occasions about my thoughts and feelings towards my coming baby.
- 2) At the time of the second visit, I will also complete a short questionnaire.
- 3) Information about my pregnancy (and past pregnancy) may be taken from my hospital chart.

It is clear to me that all of the above information will be kept completely confidential, that I may leave the study at any time and that if I do so, it will not affect my treatment in any way.

Name (Print)

Signature

Date

Name (Print)

Signature

Date

I have explained the nature of the study to the patient and believe she has understood it.

Name (Print)

Signature

Date

APPENDIX B

INTERVIEW

Subject I.D. _____

Date: _____

Age: _____

Hospital I.D. _____

Weeks pregnant: _____

Phone: _____

Have you felt quickening?

NO 0

NOT SURE 1

YES 2

Have you had ultrasound?

NO 0

YES 1

Was your pregnancy planned?

NO 0

NO BUT WANTED 1

YES 2

Did you have any difficulty conceiving?

NO 0

YES 1

Multigravidas Only

Did you have ultrasound during your first pregnancy?

NO 0

YES 1

Was your first pregnancy planned?

NO 0

NO BUT WANTED 1

YES 2

Did you have any difficulty conceiving?

NO 0

YES 1

Were there any complications with your first pregnancy?

NO 0

SOME 1

YES 2

At this point in your pregnancy, do you have a mental picture of your baby?

| (1) <u>sex</u> | | (2) <u>appearance</u> | | (3) <u>personality</u> | |
|-----------------|---|-----------------------|---|------------------------|---|
| little/no image | 0 | little/no image | 0 | little/no image | 0 |
| some image | 1 | some image | 1 | some image | 1 |
| clear image | 2 | clear image | 2 | clear image | 2 |

If you were to picture yourself and your baby at home together following the birth, what picture first comes to mind?

| (4) <u>proximity</u> | | (5) <u>affect</u> | |
|----------------------|---|------------------------|---|
| no response | 0 | neutral or no response | 0 |
| no physical contact | 1 | negative | 1 |
| looking or touching | 2 | mixed | 2 |
| holding or nursing | 3 | positive | 3 |

Do you ever communicate with your baby? How frequently?

| | (6) <u>talking/singing</u> | (7) <u>touching</u> |
|-------------------------|----------------------------|---------------------|
| no | 0 | 0 |
| less than once a day | 1 | 1 |
| 1-5 times a day | 2 | 2 |
| more than 5 times a day | 3 | 3 |

(8) How frequently does the baby enter your thoughts?

| | |
|--|---|
| less than 5 times a day | 0 |
| 5-10 times a day | 1 |
| 11-20 times a day | 2 |
| more than 20 times a day or "all the time" | 3 |

(9) When you do think of the baby, how long do your thoughts last?

| | |
|----------------------|---|
| less than 5 minutes | 0 |
| 5-20 minutes | 1 |
| more than 20 minutes | 2 |

(10) Do your thoughts about the baby ever get very strong?

| | |
|-------------|---|
| mild | 0 |
| clear | 1 |
| strong | 2 |
| very strong | 3 |

Would you tell me (more) about the various thoughts and feelings that you have about the baby at this stage?

| (11) <u>positive feeling</u> | | (12) <u>negative feeling</u> | | (13) <u>conflict</u> | |
|------------------------------|---|------------------------------|---|----------------------|---|
| no positive | 0 | no negative | 0 | no conflict | 0 |
| some positive | 1 | some negative | 1 | some conflict | 1 |
| clear positive | 2 | clear negative | 2 | clear conflict | 2 |
| very positive | 3 | very negative | 3 | very conflict | 3 |

| (14) <u>anxiety-baby</u> | | (15) <u>anxiety-self</u> | | (16) <u>global</u> | |
|--------------------------|---|--------------------------|---|--------------------|---|
| no anxiety | 0 | no anxiety | 0 | neutral | 0 |
| some anxiety | 1 | some anxiety | 1 | mostly negative | 1 |
| clear anxiety | 2 | clear anxiety | 2 | about equal | 2 |
| very anxious | 3 | very anxious | 3 | mostly positive | 3 |

During your pregnancy, have you had as much support from your husband as you would have liked or felt that you needed?

| <u>This pregnancy</u> | | <u>First pregnancy</u> | |
|-----------------------|---|------------------------|---|
| dissatisfied | 0 | dissatisfied | 0 |
| satisfied | 1 | satisfied | 1 |
| very satisfied | 2 | very satisfied | 2 |

What about support from others? (family and friends)?

| <u>This pregnancy</u> | | <u>First pregnancy</u> | |
|-----------------------|---|------------------------|---|
| dissatisfied | 0 | dissatisfied | 0 |
| satisfied | 1 | satisfied | 1 |
| very satisfied | 2 | very satisfied | 2 |

Have there been any stresses or disappointments in your life since the beginning of your pregnancy?

1. death/separation-close person
2. illness/accident-self or close person
3. bad news-self or close person
4. financial difficulty or threat
5. enforced move
6. other

What about during the time of your first pregnancy?

| <u>This pregnancy</u> | | <u>First pregnancy</u> | |
|-----------------------|---|------------------------|---|
| No | 0 | No | 0 |
| Some | 1 | Some | 1 |
| Major | 2 | Major | 2 |

APPENDIX C
QUESTIONNAIRE

WHERE ANSWERS ARE NUMBERED, PLEASE CIRCLE THE NUMBER THAT IS NEXT TO THE MOST APPROPRIATE ANSWER. FEEL FREE TO ADD COMMENTS OR CLARIFICATION AS YOU GO ALONG.

1. What is your occupation? _____

2. What is your husband/partner's
occupation? _____

3. How long have you been married? _____

4. What is your present educational level?

- 0 SOME HIGH SCHOOL
- 1 COMPLETED HIGH SCHOOL
- 2 COMPLETED COLLEGE OR UNIVERSITY
- 3 COMPLETED A POSTGRADUATE DEGREE

5. Are you presently employed?

- 0 NO
- 1 YES, PART TIME
- 2 YES, FULL TIME

6. Are you planning to work or return to work during the first 12 months after the baby's birth?

- 0 NO
- 1 NOT SURE
- 2 YES, PART TIME
- 3 YES, FULL TIME

AT THE TIME OF YOUR FIRST PREGNANCY:

1. How old were you? _____

2. How long had you been married? _____

3. What was your occupation at the time? _____

4. Your husband/partner's occupation? _____

5. What was your educational level at the time?

- 0 SOME HIGH SCHOOL
- 1 COMPLETED HIGH SCHOOL
- 2 COMPLETED COLLEGE OR UNIVERSITY
- 3 COMPLETED A POSTGRADUATE DEGREE

6. Were you employed at this stage of your first pregnancy?

- 0 NO
- 1 YES, PART TIME
- 2 YES, FULL TIME

7. Did you plan to work during the first 12 months following the baby's birth?

- 0 NO
- 1 NOT SURE
- 2 YES, PART TIME
- 3 YES, FULL TIME ✓

APPENDIX D

SCORING INSTRUCTIONS FOR THE MAIN VARIABLES

General Procedure :

The interview is semi-structured. Questions are asked in a particular order but departure from this may be required to accomodate the subject's personal style or personal priorities. Questions deal with the subject's thoughts and feelings about her coming baby and the impact of this upon her life. Responses are scored for the present stage of pregnancy, e.g., there may have been anxiety about the health of the baby or negative feeling about the baby earlier in the pregnancy which have subsided by the time of the interview.

The variables, their definitions and scoring categories are outlined on the following pages. Criteria for scoring each category are given with examples of typical responses to assist in scoring.

Scoring: Subjects are scored for final response, whether this is spontaneous or in response to further questioning. A "clear" image may have changed (e.g., boy to girl) from earlier in pregnancy but is nonetheless scored "clear". Comments related to this question which occur later in the interview are included in the scoring.

| | | |
|---|--------------------|--|
| 0 | LITTLE OR NO IMAGE | no image of the sex of the baby for whatever reason "not really - not at this stage" "don't mind one way or the other" |
| 1 | SOME IMAGE | sex of the baby considered but lacking in- clarity and specificity "the way it moves, it seems more like a boy, but I can't tell for sure" "I hope it's a girl, so I tend to think of it as one, but it could just as easily be a boy" |
| 2 | CLEAR IMAGE | clear and specific image of the sex of the baby "the way it moves, I'm convinced it's a boy" "earlier on I thought it was a boy, but now I'm sure it's a girl" |

Question 2: Appearance of the Baby

- 0 LITTLE OR NO IMAGE no image of specific physical features of baby for whatever reason
 "tiny and wrinkled"
 "a little bundle or package"
 "all newborns look the same"
- 1 SOME IMAGE some image of physical features but limited in number or lacking clarity and specificity
 "black hair and brown eyes"
 "like my daughter" (with no elaboration)
- 2 CLEAR IMAGE detailed image of physical features which is both clear and specific
 "small pixie face, darkish hair and a nice smile."
 "like my daughter" (with elaboration)

Question 3: Personality of the Baby

- 0 LITTLE OR NO IMAGE no image of specific personality traits of the baby for whatever reason
 "haven't a clue"
 "don't know that until after they are born"
- 1 SOME IMAGE some image of personality traits but limited in number or lacking clarity and specificity
 "a good baby" or "an active baby"
 "like my son" (with no elaboration)
- 3 CLEAR IMAGE detailed image of personality traits which is both clear and specific
 "blend of two parents-calm, intelligent, probably not too athletic"
 "like my son" (with elaboration)
 "a monster-stubborn and difficult like me"

VARIABLE 2: POSTNATAL PICTURE

Definition: the pregnant woman's image of herself and her baby at home together following the birth (includes proximity of mother to baby and affect associated with image)

Scoring: subjects are scored for their response at the time of questioning.

Question 4: Proximity

- | | | |
|---|---------------------|---|
| 0 | NO RESPONSE | subject cannot or will not respond |
| 1 | NO PHYSICAL CONTACT | <p>mother and baby not in direct physical contact</p> <p>"The baby is in a cradle upstairs and I am downstairs doing some cleaning"</p> <p>"I'm reading in the baby's room while she sleeps"</p> <p>"Taking the baby for a ride in the buggy"</p> |
| 2 | LOOKING-TOUCHING | <p>physical contact between mother and baby.</p> <p>"The baby is lying in his bed and I am watching him"</p> <p>"Changing diapers"</p> |
| 3 | HOLDING-NURSING | <p>close physical contact between mother and baby.</p> <p>"Holding the baby- he's wrapped in a blanket and cuddled into my neck"</p> |

Question 5. Affect

- | | | |
|---|------------------------|---|
| 0 | NEUTRAL OR NO RESPONSE | <p>no feeling expressed about the baby.</p> <p>"All is quiet, Im not really thinking about him at the moment-planning what we'll have for supper"</p> |
|---|------------------------|---|

- 1 NEGATIVE only negative feeling expressed (fatigue, stress, resentment, including joking references).
"I'm really upset-I'm holding the baby and my little girl is screaming"
- 2 MIXED mixture of positive and negative responses.
"Wanting so much to cuddle him but very worried that my other little boy will feel deserted"
- 3 POSITIVE only positive feeling expressed.
"I am feeling very happy and very proud"

VARIABLE 3: COMMUNICATION WITH THE BABY

Definition: the frequency of communication with the baby (includes talking and singing to the baby and stroking abdomen while thinking of the baby).

Scoring: subject is scored for greatest frequency.

Questions 6: Verbal Communication and 7: Tactile Communication

- 0 NO
- 1 LESS THAN ONCE A DAY
- 2 1 - 5 TIMES A DAY
- 3 MORE THAN 5 TIMES A DAY

VARIABLE 4: THOUGHTS ABOUT THE BABY

Definition: the frequency, duration and intensity of thoughts about the baby.

Scoring: score is for the greatest frequency, longest duration and strongest intensity of thoughts at the time of the interview. The score for one category should not influence scoring for the other 2 categories. Score is not based on the content of thoughts (e.g., joy, anxiety, excitement etc.).

Question 8: Frequency of Thoughts

- 0 LESS THAN 5 TIMES A DAY
- 1 5 - 10 TIMES A DAY
- 2 11 - 20 TIMES A DAY
- 3 MORE THAN 20 TIMES OR "ALL THE TIME"

Question 9: Duration of Thoughts

- 0 LESS THAN 5 MINUTES
- 1 5 - 20 MINUTES
- 2 MORE THAN 20 MINUTES

Question 10: Intensity of Thoughts

- 0 MILD little involvement reported or intensity of thoughts is minimized by the subject. Thoughts are never so intense as to disrupt activity or interfere with concentration.
 "I'm so busy with other things that I don't really have time to get involved"
- 1 CLEAR clear involvement reported but thoughts are never so intense as to disrupt activity or interfere with concentration.
 "I don't lose sleep over it or anything but the worry is definitely there."
- 2 STRONG intensity of thoughts threatens to disrupt activity or interfere with concentration.
 "I get really choked up sometimes-close to tears."
- 3 VERY STRONG intensity of thoughts is actually disruptive or interferes with concentration.
 "I have a great deal of trouble getting to sleep."
 "I can't concentrate at work."

VARIABLES 11 - 15: DEFINITIONS

Variable 11 - Positive Feeling: the degree to which responses express the pleasurable and/or rewarding aspects of having the baby. Examples: excitement about the baby's arrival, expressions of affection, acceptance, protectiveness, pride, pleasure in caretaking, in the baby's individuality and in shared activity.

Variable 12 - Negative Feeling: the degree to which responses express difficult and/or unrewarding aspects of having the baby. Examples: doubts or apprehensions about the baby's temperament or personality (colic, hyperactivity, crying), change or adjustment in routine, lifestyle, roles or family relationships which are regarded as difficult or undesirable, any expression of hostility, rejection or resentment related to the baby (even if joking).

Variable 13 - Conflict: both positive and negative feelings are expressed and experienced to some degree as incompatible.

Variable 14 - Anxiety-Health of Baby: the degree to which the subject is troubled or worried about the physical and/or emotional well-being of the baby.

Variable 15 - Anxiety-Self as Mother: the degree to which the subject is troubled or worried about her capacity to deal with the demands of motherhood. Examples: feeling depleted, disorganized, resentful, that she may be unfair, not calm or loving enough.

Variables 11 - 15: Scoring

The initial questioning is open-ended. The interviewer then inquires about any category not spontaneously described by the subject. Space is provided for recording the content of the responses. Each category is scored separately and scoring on one category should not influence scoring on the others. Scoring is based on the interview as a whole and on feelings at the time of the interview. Differences in personality and verbal facility should not influence the scoring. The following criteria and examples of responses are used as guidelines for scoring:

- 0 NO POSITIVE/NO NEGATIVE/NO CONFLICT/NO ANXIETY
 absence or denial of feelings in the category under consideration.
 "Definitely not."
 "I just don't let myself think about that."
- 1 SOME POSITIVE/SOME ~~NEGATIVE~~/SOME CONFLICT/SOME ANXIETY
 feelings receive little emphasis in the interview. At no point are they clearly stated, or if stated, subject dismisses or minimizes them.
 "It's not too real yet, I guess what I most feel is sort of curious."
 "I'm not perfect, but all in all, I think I'll be a pretty good mother."
- 2 CLEAR POSITIVE/CLEAR ~~NEGATIVE~~/CLEAR CONFLICT/ CLEAR ANXIETY
 feelings are clearly stated at some point during the interview.
 "I am really looking forward to seeing and holding the baby."
 "There are a few things that I know I won't enjoy, like not getting enough sleep and being more restricted in my other activities."
 "I do worry that I might not have the patience and stamina to handle two."
- 3 VERY POSITIVE/VERY NEGATIVE/VERY CONFLICTED/VERY ANXIOUS
 feelings receive considerable emphasis during the interview. They are stated consistently throughout the interview or at one point with unquestionably strong feeling on the part of the subject.
 "I am terrified that the baby will be brain damaged."
 "I really enjoy being a mother, taking care of them when they are so tiny, watching them change and grow, I like nursing a lot and can hardly wait to hold and cuddle him."
 "Quite honestly, I wonder if I'm up to it. I'm not that easy to get on with. I think it's very possible that I'll lose my temper and just not be able to deal with the whole thing."

VARIABLE 16: GLOBAL SCORE

Definition: the overall balance of the subject's positive and negative feelings about the baby at the time of the interview.

- | | | |
|---|-----------------|---|
| 0 | NEUTRAL | little or no positive or negative feeling about the baby. |
| 1 | MOSTLY NEGATIVE | negative feelings outweigh positive feelings. |
| 2 | ABOUT EQUAL | positive and negative feelings approximately equally represented. |
| 3 | MOSTLY POSITIVE | positive feelings outweigh negative feelings. |

APPENDIX EScoring Instructions For The Additional VariablesGeneral Procedure:

The twelve additional variables are included in either the early or late pregnancy interview, or as part of the questionnaire which follows the late pregnancy interview. The questionnaire is self-administered: scoring decisions are therefore entirely in the hands of the subject. The interviewer makes the final scoring decision for all interview items. The decision is based on 1) the content of the subject's response and 2) clinical judgement.

1. Quickening: has the subject felt movement?

- 0 NO clear negative reply
- 1 NOT SURE something felt but subjects is not sure that it is fetal movement
- 2 YES clear positive reply

2. Ultrasound: has the subject had ultrasound?

- 0 NO no ultrasound
- 1 EARLY subject had ultrasound before the early pregnancy interview
- 2 LATE subject had ultrasound between the early and the late pregnancy interviews
- 3 BOTH subject had ultrasound both before and after the early pregnancy interview

3. Planned Pregnancy: was the pregnancy planned or unplanned?

- 0 NO pregnancy was neither planned nor wanted at the time of conception
- 1 NO, BUT WANTED pregnancy not specifically planned but nevertheless wanted at the time of conception
- 2 YES pregnancy both planned and wanted at the time of conception

4. Difficulty Conceiving: was there any difficulty conceiving?

- 0 NO all those not scoring 1
- 1 YES failure to conceive after 6 or more months of trying

5. Complications of Pregnancy: were there any physical complications of pregnancy?

- 0 NO no complications whatsoever reported
- 1 SOME any physical condition or complaint causing discomfort or concern to the subject but not posing a threat to the health of either mother or baby
e.g., nausea or vomiting, minor swelling, pains, cramps, fatigue, heartburn, minor illnesses.
- 2 YES any condition that poses a threat or potential threat to the health of either mother or baby
e.g., hypertension, premature labour, too little weight gain or obesity, renal disease, diabetes.

6. Support from Spouse: perceived emotional support from spouse during the course of pregnancy.

- 0 DISSATISFIED clearly stated dissatisfaction with support from spouse during course or the current pregnancy (can be either "too much" or "too little")
- 1 SATISFIED satisfaction grudgingly or half-heartedly stated
- 2 VERY SATISFIED satisfaction with support from spouse is clearly and enthusiastically stated

7. Support from Others: perceived emotional support from others (family, friends) during the course of pregnancy

same criteria as for Support from Spouse

8. Stress during Pregnancy: occurrence of stressful life events during the course of pregnancy.

- 0 NO no stress, i.e., a clear, unqualified negative response
- 1 SOME "yes" responses that are not considered severe enough to be scored 2 (see below).
e.g., "not getting on with my boss too well"
"our basement was badly flooded"
"our cat has been sick"
- 2 YES any stressful event which comes under the following categories:
(1) death of or separation from a close person
(2) life threatening illness or accident involving self or a close person
(3) major bad news about self or close person
(4) major financial difficulty or threat of it
(5) enforced move
(6) other?

9. Length of Marriage: how long has the subject been married?

(in years)

10. Maternal Education: highest educational level achieved.

- 0 SOME HIGH SCHOOL
1 COMPLETED HIGH SCHOOL
2 COMPLETED COLLEGE OR UNIVERSITY
3 COMPLETED A POSTGRADUATE DEGREE

11. Employment: is the subject working?

- 0 NO
1 YES, PART TIME
2 YES, FULL TIME

12. Postnatal Employment Plans: does the subject plan to work during the first postnatal year?

- 0 NO
- 1 NOT SURE
- 2 YES, PART TIME
- 3 YES, FULL TIME

APPENDIX F

A GUIDE TO PREGNANCY RISK GRADING

A GUIDE TO PREGNANCY RISK GRADING

At each antenatal visit please give your assessment of pregnancy (fetal plus maternal) risk according to the following grading system. The risk factors or problems listed below are intended as *examples only*. Additional space is provided for other risk producing problems which you have identified. This risk grading system is intended as a basis for planning the ongoing management of the pregnancy.

Pregnancy at no predictable risk

- ☐ NO PRIOR PERINATAL MORTALITY OR LOW BIRTHWEIGHT INFANT
- ☐ NO SIGNIFICANT MEDICAL DISEASE
- ☐ NO PREGNANCY COMPLICATIONS NOW OR IN THE PAST (Bleeding, Hypertension, Premature Labour)
- ☐ FETAL GROWTH SEEMS ADEQUATE

Pregnancy at risk

The fetus and/or mother are definitely at risk and consultation should be obtained with a specialist obstetrician in your area. In addition, consultation with an appropriate internist may be necessary. These patients may be managed by continuing collaborative care and delivery in an obstetrical unit with intermediate level nursing facilities OR they may be returned to the care of the referring physician with a suggested plan of management for the remainder of the pregnancy.

- | | |
|---|--|
| <input type="checkbox"/> DIABETES, CLASS A (GESTATIONAL) OR CLASS B | <input type="checkbox"/> RENAL DISEASE WITHOUT HYPERTENSION |
| <input type="checkbox"/> HYPERTENSION WITHOUT TOXAEMIA | <input type="checkbox"/> MILD TOXAEMIA |
| <input type="checkbox"/> APH, CEASED AND IN HOSPITAL | <input type="checkbox"/> CONTROLLED PREMATURE LABOUR |
| <input type="checkbox"/> CERVICAL INCOMPETENCE | <input type="checkbox"/> MULTIPLE PREGNANCY |
| <input type="checkbox"/> HYDRAMNIOS | <input type="checkbox"/> BREECH PRESENTATION |
| <input type="checkbox"/> POST-DATE PREGNANCY (42 weeks +) | <input type="checkbox"/> PRIMIGRAVIDA (age 35 +) |
| <input type="checkbox"/> HISTORY OF PRIOR STILL BIRTH OR NEONATAL DEATH | <input type="checkbox"/> HISTORY OF GENETIC DISEASE IN FAMILY (Genetic Amniocentesis or Counselling required) |
| <input type="checkbox"/> MATERNAL OBESITY | <input type="checkbox"/> ANAEMIC NOT RESPONDING TO IRON (< 10gm) |
| <input type="checkbox"/> SIGNIFICANT TOBACCO, ALCOHOL, DRUG INTAKE | <input type="checkbox"/> WEIGHT GAIN < 10lbs. BY 30 WEEKS |
| <input type="checkbox"/> RHESUS IMMUNIZATION | <input type="checkbox"/> GRAND MULTIPARA |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

Pregnancy at high risk

Pregnancies which are so complicated that the fetus and/or mother are obviously in danger. If at all possible, these patients should be transferred to a regional perinatal centre (level III) for intensive care and delivery. Clearly, there are patients who deserve to be placed in this risk category (with problems such as excessive antepartum bleeding, cord prolapse, or advanced uncontrolled premature labour) who cannot be transferred safely or in time to benefit the fetus or mother.

- | | |
|---|---|
| <input type="checkbox"/> DIABETES CLASS C, D, F, R OR SIGNIFICANTLY COMPLICATED | <input type="checkbox"/> HYPERTENSION WITH SUPERIMPOSED TOXAEMIA |
| <input type="checkbox"/> RENAL DISEASE WITH HYPERTENSION ± ↓ FUNCTION | <input type="checkbox"/> EARLY UNCONTROLLED PREMATURE LABOUR * |
| <input type="checkbox"/> PREMATURE RUPTURE OF MEMBRANES (± SEPSIS) * | <input type="checkbox"/> SEVERE FETAL GROWTH ARREST (< 10th Percentile) |
| <input type="checkbox"/> ANTEPARTUM BLEEDING, CONTINUING OR REPEATED * | <input type="checkbox"/> HEART DISEASE, ESPECIALLY WITH FAILURE |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

* particularly 24 - 34 weeks gestational age.

Two or more minor risk problems can combine to produce a high pregnancy risk. Such a patient may deserve to be placed in a higher risk category.

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