CHILDBIRTH EDUCATION:
IMPLICATIONS FOR
MATERNAL-INFANT ATTACHMENT

by
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This Thesis is Dedicated to

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ABSTRACT

This study examined the relationship between Lamaze childbirth education and maternal-infant attachment. The sample consisted of sixty-one primiparous mothers who were scored on the Neonatal Perception Inventory at one day and one month postpartum. It was hypothesized that the Lamaze or experimental mothers would form a greater attachment to their infants as compared to the control mothers. Analysis of the data revealed, however, that the control mothers had a significantly greater degree of maternal-infant attachment. Several explanations for these results are discussed.
CHAPTER 1
INTRODUCTION

Attachment, or bonding, is defined as a ".... unique relationship between two people which is specific and endures through time",(Klaus, & Kennell, 1976a, p.2). There is a sensitive period for each species during which time this bond must be formed if attachment is to occur (Klaus & Kennell, 1976a). If mother and infant are separated early during this period, there is less probability of an optimal bond forming. Should this separation last through the sensitive period, no attachment will occur.

There have been many studies designed to determine which factors are involved with infants forming attachments to their mothers. More recently, however, research has reflected interest in the opposite direction; i.e., how mothers become attached to their infants. While much of this research is based on mammalian studies, Drs. Klaus and Kennell have done studies in this area with humans.

Klaus and Kennell (1976a) state that it is the first hour postpartum which is the optimal period for the formation of a strong maternal-infant bond in humans. According to these researchers, the infants are more alert and receptive toward any interaction attempts which are
initiated by their mothers within the hour. By responding to these attempts the infants reinforce their mothers' behaviors, creating a more positive experience in which a bond could be formed.

Just as there are many factors after birth which make the entire birthing process a more positive experience, and which, therefore, facilitate and increase bonding, there are also factors before and during birth which affect the total experience. One such factor might be childbirth education classes. In recent years, these classes have become increasingly popular with expectant mothers. By educating their participants on the physiological processes normally involved in pregnancy and the actual birthing process, childbirth education classes allow women to enter childbirth with less fearful anxiety and greater confidence that they can remain in control throughout the process, thus reducing the fear-tension-pain cycle (Ewy & Ewy, 1976).

Childbirth education classes may facilitate the maternal-infant bond in another important way; e.g., by reducing the probability that drugs will be utilized during labor and delivery. The women's subsequent alertness allows them to remain active participants in the birth of their infants, while their infants' alertness allows the infants to respond to their mothers' interaction attempts. Thus, maternal-infant bonding is seemingly facilitated.
Purpose

The purpose of this study was to determine empirically what effects, if any, childbirth education classes have on maternal-infant bonding.

Hypothesis

The experimental mother (i.e., having participated in Lamaze childbirth education classes) would exhibit a higher degree of maternal-infant bonding than the control mothers (i.e., having no childbirth education experience).

Assumption

For the purpose of this study, it was assumed that the mothers and infants had an initial contact immediately following birth corresponding to the sensitive attachment period.

Justification

Factors that facilitate the bonding process may make parenting a more positive experience -- for mothers, as well as for infants. The effects of an increased amount of maternal-infant bonding could mean a decreased rate of child abuse. Through improved measures, it may be possible to begin monitoring the bonding process and its formation during the prenatal period. In this manner, those mothers who are not optimally bonding to their infants may be detected and perceived as high-risk for subsequent
emotional development and attachment. If such a process could be shown to be associated with or to be a causal factor of child abuse, the mother would be detected early enough so that an intervention procedure could be implemented. If it can be determined that childbirth education classes constitute one such factor, they should receive a greater emphasis among expectant mothers in the future.
CHAPTER 2
REVIEW OF LITERATURE

The Review of Literature will be divided into three sections: (1) Maternal-infant attachment, (2) Childbirth education classes, and (3) the Lamaze childbirth class. The first section deals with animal and human studies pertaining to attachment, and relates factors which can affect the attachment process. The second section details the area of childbirth education as an entity and includes information on the use of medication during the childbirth process. The third section focuses specifically on the Lamaze childbirth preparation method, describing its principles and its effectiveness.

Maternal-Infant Attachment

A unique characteristic of maternal-infant attachment is that infants are totally dependent after birth on some significant other for their survival (Klaus & Kennell, 1976a). With lower mammals, infant survival is insured since the infants literally cling to their mothers; however, with higher mammals, this survival is not so easily assured, since these infants cannot hang on to their mothers and they must be carried (Bowlby, 1969). Thus, the attachment process is even more crucial in these higher mammals, as
the mothers have a major role in infant care and survival. Clearly, the chance of the infants' survival decrease if a bond does not form.

In animals, the maternal-infant bond must be formed within a certain period of time, referred to as a sensitive period. A variety of studies demonstrating the existence of this period have been conducted (Barnett, Leidermann, Grobstein & Klaus, 1970; Bowlby, 1969; Hales, Lozoff, Sosa & Kennell, 1977; Kennell, Jerauld, Wolfe, Chesler, Kreger, McAlpine, Steffa & Klaus, 1974; Klaus, Jerauld, Kreger, McAlpine, Steffa & Kennell, 1972; Klaus & Kennell, 1970, 1976a, 1976b; Klopfer, 1971; Leifer, Leiderman, Barnett & Williams, 1972). Klaus and Kennell (1976b) found that when lambs are taken away from their mothers within the first hour and then later returned, forty percent of the returned lambs will not be accepted. However, after the mothers have spent one hour together with their lambs, each mother will accept only her lamb, even if they are separated thereafter. A similar study was conducted by Klopfer (1971) with goats. Whereas fourteen of the fifteen mothers allowed contact with their kids during the first five minutes of postpartum accepted them after one to three hours of separation, only two mothers of fifteen who experienced an immediate postpartum separation from their kids accepted them later for
nursing. Separating mother rats from their baby pups immediately after birth had devastating effects, since even if reintroduced to their mothers after five days, all of the pups died because the mothers refused to take care of them (Klaus & Kennell, 1976a). Mother monkeys who were parted from their infants for one hour after birth still showed a neonate preference, since any neonate presented to them, whether or not their own, would receive maternal care. But after twenty-four hours of deprivation the preference was gone (Klaus & Kennell, 1976a).

These studies point to the conclusion that separating neonates from their animal mothers may have disastrous effects by decreasing attachment and thereby permanently impairing or totally eliminating maternal caretaking behavior. The sooner after birth the separation occurs, the more disastrous are the effects. Each species seems to have a certain period of time to optimally facilitate the attachment process. If the separation lasts longer than this sensitive period, no attachment occurs (Klaus & Kennell, 1976a).

While it has not been demonstrated that the results of these animal studies can be completely generalized to the case of humans, there is some evidence for a sensitive period in humans also. In an Israeli hospital, two mothers were given the wrong baby. At their two-week
check-up, the mistake was noticed and attempts were made to remedy the situation. Each mother was so attached to the other's baby, that even when offered her own, she was hesitant to give the other baby up. After one month of living with her own baby, the mother still would often remark on how lovely the other infant had been (Klaus & Kennell, 1976a; Klaus, et. al., 1972).

Even a brief postpartum separation affects the maternal-infant relationship. Mothers experiencing such a separation have disturbed maternal behaviors throughout the first postpartum year or longer (Barnett, et. al., 1970; Klaus & Kennell, 1970, 1976a, 1976b; Klaus, et. al., 1972; Leifer, et. al., 1972). Leifer, et. al., (1972) has shown that when mothers were separated from their infants, they were not as confident in their caretaking ability as mothers who had contact with their infants. This was especially true for primiparous mothers. A controlled study was conducted (Kennell, et. al., 1974; Klaus & Kennell, 1970, 1976a, 1976b; Klaus, et. al., 1972) in which an experimental group of mothers had extended contact with their newborns, consisting of one hour of contact within the first two hours of delivery, plus five hours on each of the next three days. The control group received only a glance of their infant at birth, with twenty to thirty minute contacts every four hours for feeding for the next three days. The experimental and control mothers
showed significant differences in their maternal behaviors. At one month, the experimental mothers maintained a greater physical proximity to the infant, more soothing behavior during the physical exam, and more eye-to-eye contact and fondling during feeding. These behaviors persisted at one year. At two years, the experimental mothers used fewer commands, asked twice as many questions and used more adjectives and less content words with their infants in comparison to the control mothers. Hales, et. al, (1977) found the same behavior patterns at one month postpartum also.

For the first hour of life, neonates are in a quiet alert state with their eyes wide open for prolonged periods. Such a state in itself facilitates bonding, since when the neonates are alert they respond more to their mothers' stimulation, thereby giving their mothers the crucial feedback they need to maintain the interaction process. Mothers are greatly interested in their infants' eyes; Klaus and Kennell (1976a) found that mothers first speak words pertaining to the eyes. A strong point underlying the importance of eye contact and feedback is found in a study in which it was discovered that mothers of blind infants have difficulty in feeling close to their infants (Klaus & Kennell, 1976a). Therefore, en face, the position in which mothers position their faces so that their eyes and
their infants' eyes meet in the same vertical plane, may be indicative of an interest in establishing reciprocal communication with the infant, and is particularly important for attachment (Hales, et al., 1977; Hotchner, 1979; Klaus & Kennell, 1976a).

Infants also move their limbs and body in rhythm to spoken words, despite the language spoken, but not to discontinuous syllables (Hotchner, 1979; Klaus & Kennell, 1976b; Parfitt, 1977). If the infants do not respond in either of these ways -- either with their eyes or movements -- it becomes increasingly harder for the mothers to respond to them (Klaus & Kennell, 1976a).

Neonates begin to process a vast amount of information from their environment from the moment of birth. They show distinct visual preferences for visual contrast, edges, curved lines and a normal facial arrangement as opposed to an arrangement with scrambled facial features. They also engage in imitative gestures such as opening their mouths when being spoken to (Parfitt, 1977).

The attachment-bond fluctuates and can be easily disturbed and possibly altered permanently in its early stage of formation; however, once attachment has been formed it tends to be relatively stable. Since reciprocal interactions between mothers and infants are important for the optimal development of the attachment process,
infants who are unresponsive to their mothers' interaction attempts, either due to medication or medical disorder, will hinder the bonding process. Maternal feelings and behaviors seem to be elicited by the infants': (1) behaviors, (2) appearance, and (3) ability to exhibit behaviors typical of adult forms of social communication. For example, infants who smile and attend to the human voice usually gain attachment. When the skills and behaviors of the infants coincide with the mothers' expectation, usually within the first week of life, there appears a mutual responsiveness within the dual interaction process that creates an environment in which attachment can continue to develop. Thus, an interaction process after the first week of readjustment affords the opportunity to speculate as to the quality of the future mother-infant relationship (Brazelton, 1963; Brazelton, 1976; Coates, Anderson & Hartup, 1972; Hotchner, 1979; Klaus & Kennell, 1976a; Robson & Moss, 1970; Sugarman, 1977; Tanzer, 1976).

Therefore, it appears that the immediate postpartum period is vital in the formation of a powerful attachment between mothers and infants.

The original mother-infant bond is the wellspring for all the infant's subsequent attachments and is the formative relationship in the course of which the child develops a sense of himself. Throughout his lifetime the strength and character of this attachment will influence the quality of all future bonds to other individuals (Klaus & Kennell, 1976a, pps. 1-2).
There are seven principles crucial to attachment as outlined by Klaus and Kennell (1976a, p. 14):

1. There is a sensitive period during the early minutes and hours of life when both parents must have contact with their baby for parental behavior to be optimal at a later date.

2. When first given the baby, there is apparently species-specific behavior by parents.

3. The attachment process is so structured that parents can attach themselves to only one infant at a time.

4. "You cannot love a dishrag." The baby must respond to his mother's attention or maternal attachment will not be facilitated.

5. Active participants in birth, no matter who they are, will become strongly attached to the infant.

6. Attachment and detachment processes are not compatible.

7. Early events have long-lasting effects.

Many researchers feel that the period just before birth, or the birth experience itself, is important in determining the pattern of maternal-infant interaction (Broussard & Hartner, 1971; Peterson & Mehl, 1978). Mothers' experiences during labor and delivery constitute a critical transition point in the development of maternal-infant attachment, since the psychological factors underlying the childbirth process are an accumulation of prenatal experiences which significantly affect the mothers' birthing experiences and, in turn, affect maternal
behaviors and affectional beliefs (Arms, 1979; Peterson & Mehl, 1978).

As a critical transition point in the mothers' lives, pregnancy is inherently a time when adaptation and adjustment to novel tasks must be confronted by each individual. The manner in which one copes with the changes associated with pregnancy and childbirth may determine any long range consequences of the maternal-infant relationship. The healthier the mothers' personal adjustment on these tasks, the more freedom these mothers have in the expression of their maternal roles (Bibring, Dwyer, Huntington & Valenstein, 1961; Brazelton, 1963; Flapan & Schoenfeld, 1972).

Unlike pregnancy, the crisis of adjustment does not end with the delivery of an infant. When the mothers' expectation for the ideal labor and delivery or for herself as the ideal mother are not fulfilled in reality, the accompanying feelings of guilt may hinder the early attachment process by placing the mother in a state of depression.

As the mothers regain their equilibrium and the infants establish their own physical equilibrium, the mothers and infants may interact to create a positive relationship. But, if the mother has difficulty adjusting to and regaining her equilibrium from her disappointments
and negative feelings, then maternal disorders may persist which will detract from the attachment process. This depression may also be due partly to the phenomenon of "missing pieces" or not being able to remember the entire birthing experience (Affonso, 1977). In view of the fact that the state of postpartum depression appears to be more severe among primiparous mothers, the question has been raised as to whether or not the primaparas have had sufficient time to adjust to their pregnancies and new maternal roles sufficiently to gain their equilibrium and become attached to their infants. With multiparas, there has been a greater time period in which to adjust, but the primaparas receive the full force of this crisis. This information offers support for proposing that the frequent problems encountered during the early maternal-infant relationship may be due to an incomplete adjustment and ability to regain individual equilibrium at the time of delivery (Bibring, et. al., 1961; Brazelton, 1963; Nott, Franklin, Armitage & Gelder, 1976; Tanzer, 1976).

Mothers who have received medication are neither prepared to optimally interact with and respond to their infants due to the effects of the medications, nor are they more willing to see their infants immediately following birth. In contrast, mothers who are conscious, and who have received little or no medication, do not
make negative comments about their infants and actually express the desire to have contact with their neonates immediately after birth, rather than wait and see them later (Tanzer, 1976).

Again, the mothers' levels of adjustment may indirectly limit their ability to interact with their infants, as those mothers manifesting anxiety and/or poor adaptation towards their pregnancies received greater levels of anesthesia and/or pain-relieving medication during labor and delivery. This medication, in turn, may make the mothers more vulnerable to the "missing pieces" phenomenon. Hence, it appears that optimal facilitation of the bonding process is dependent on minimal medical interference with a normal labor and delivery (Affonso, 1977; Parfitt, 1977; Tanzer, 1976; Yang, Zweig, Douthitt & Federman, 1976; Zax, Sameroff & Farnum, 1975).

Summary

The infants' first minutes and hours of life are important in establishing an optimal maternal-infant bond. The strength of the bond or the degree of attachment which occurs during the sensitive period, can have effects on the maternal-infant relationship lasting more than one year postpartum. Practices which develop a positive maternal attitude and adjustment toward pregnancy and childbirth and which minimize medical procedures during delivery facilitate the establishment of such a bond.
Childbirth Education

The fear-tension-pain cycle, commonly referred to in the literature of childbirth education, refers to the fact that women's fears about childbirth are in large part responsible for the generation of tension and ultimately the development of pain during childbirth. More specifically, this fear produces tension which causes mothers to fight the uterus' efforts to dilate the cervix. While childbirth is not absolutely painless, the intensity of pain experienced can be reduced by alleviating fears and reducing tension. It is the purpose of childbirth education classes to teach methods which facilitate the reduction of the fear-tension-pain cycle and help to make the childbirth experience a more positive one (Bean, 1974; Parfitt, 1977).

The historical beginnings for childbirth education reside in Dr. Grantly Dick-Read's conception of natural childbirth. Read defined the concept of natural childbirth as a birth in which "no physical, chemical or psychological condition is likely to disturb the normal sequence of events or disrupt the natural phenomenon of parturition" (Parfitt, 1977, p. 41). Natural childbirth is an approach that instructs mothers to cope with each contraction by turning inward and relaxing to decrease the intensity of their pain. However, the major criticism is that Read's
method leaves many questions about the actual childbirth unanswered; hence, his preparation appears somewhat mystical and unsatisfying in an intellectual realm (Bean, 1974; Ewy & Ewy, 1976; Parfitt, 1977).

Since the conception of natural childbirth, many different methods of childbirth education have developed; e.g., Bradley, Lamaze, Leboyer, Kitzinger and Wright. All of these preparations have served to augment the method proposed by Read by making childbirth education exactly what it is labelled—knowledge of the facts surrounding the various realms involved with childbirth. In this manner, the mystique and dissatisfaction previously associated with childbirth education has been greatly decreased (Bean, 1974; Parfitt, 1977).

While these various methods differ in their educational emphasis, as well as in their proposed techniques, they all adhere to the same underlying principles. Briefly, these are:

1. Limbering-up exercises to increase flexibility for childbirth.
2. Knowledge of the physiological processes of childbirth.
3. Emotional support during childbirth.
4. Techniques to facilitate relaxation during childbirth.
5. Techniques to facilitate controlled breathing during childbirth.
While these principles are approached in varying manners, depending on the method being studied, they all are serving the same purpose: All of the methods bestow to the mothers a greater sense of control over the childbirth process. This control ultimately results in an inhibited fear-tension-pain cycle, which, in turn, decreases the need for medication during labor and delivery and hypothetically increases the degree of maternal-infant attachment (Arms, 1979; Bean, 1974; Bing, 1977; Bradley, 1974; Dick-Read, 1972; Hotchner, 1979; Klusman, 1975; Lamaze, 1965; Leboyer, 1975; Parfitt, 1977; Tanzer, 1976).

Within contemporary medical practice, it has become a common assumption by medical personnel and mothers alike that childbirth is painful and that medication is necessary for pain relief. While childbirth education can decrease the mothers' need for medication during labor, it is estimated that ninety percent of all labors in our society today are still accomplished with some degree of medical interference (Arms, 1979; Parfitt, 1977). Since drug effects can seriously alter the attachment process, a consideration of other possible effects of analgesics and anesthetics on mothers and their infants is vital (Caldwell, 1976; Hotchner, 1979; Klaus & Kennell, 1976a; Tanzer, 1976).
Barbiturates and narcotics, such as Demerol and Nisentil, are commonly used analgesics in labor. Such medication affects mothers by decreasing their respiration rates and blood pressures; however, barbiturate effects occur to a lesser degree in comparison to narcotic effects (Bean, 1974; Parfitt, 1977).

Conduction or local anesthesia allows mothers to remain conscious during labor, but they remain less active than mothers who have not received anesthesia. Conduction anesthesia may slow the delivery process down, thereby increasing the possibility of the administration of oxytocin and the utilization of forceps. As with analgesics, mothers' blood pressures may drop (Bean, 1974; Parfitt, 1977).

Unfortunately, labor medication that affects mothers also affects neonates. There is no clear placental barrier which prevents drug passage from the mothers' circulatory systems to the fetus'. Although drug penetration depends on physiochemical properties, it is generally true that the fetal circulatory system is less accessible to drugs than other body tissues. However, since medication is administered repeatedly to mothers during labor, there tends to be a build-up of the drug in their bodies and therefore, in the fetal circulation. Since neonatal metabolism and excretion processes
are not fully operational, the optimal time for birth is when the drug level of the neonates is as low as possible (Arms, 1979; Caldwell, 1976; Hoñchner, 1979).

In 1970, the Society for Research in Child Development published a report which stated:

Virtually, all obstetric medication—nausea remedies, diuretics, sedatives, muscle relaxants, analgesics, regional anesthesia and general anesthetics—tend to rapidly cross the placenta and alter the fetal environment as they enter the circulatory system of the unborn infant within seconds or minutes of administration to the mother (Bean, 1974, pps. 129-130; Parfitt, 1977, p. 71).

For example, Pethidine can affect infants by producing sedation and a generalized central nervous system depression, including respiratory depression. Marcaine may impair heart conduction, produce mild mental confusion and motor incoordination. The normal neurological and psychological development patterns of the neonates may be affected by these analgesics. As the mothers' blood pressures drop, so do the blood and oxygen supplies to the fetus. Babies of mothers who have received certain drugs in labor show a three-fold incidence of Apgar scores of six or less and have a decrease in cortical activity for several days after their birth due to the medications stored in their midbrains (Arms, 1979; Hetherington & Parke, 1975; Parfitt, 1977). Arms (1979) has stated that such depression may affect the later motor and intellectual development of
children even though it seems reversible. In her words (p. 89): "How many times must it be said? . . . Drugs get to the baby. Drugs adversely affect the baby. Drugs may permanently damage the baby."

Summary

Within the past few decades, childbirth education classes have served the purpose of instructing expectant parents in the knowledge of the childbirth process and dispelling the frightening myths surrounding the experience. Through such knowledge, the childbirth experience hopefully becomes a more positive one. While Dr. Dick-Read's approach seems unsatisfactory in the intellectual realm, his natural childbirth method does decrease the intensity of pain experienced, which, in turn, makes the necessity of medication less for mothers during delivery. The utilization of less medication seems to facilitate the positive feedback necessary in the attachment process.

The Lamaze Method

The most prevalently attended childbirth education classes are those which prepare parents for a Lamaze childbirth (Parfitt, 1977). However, to label the Lamaze approach as natural childbirth is a misnomer, for, unlike Read's approach, Lamaze requires active involvement on the parents' part to make the childbirth experience as positive as possible. In Lamaze, the parents must stringently
prepare for their upcoming task (Bean, 1975; Bing, 1977; Ewy & Ewy, 1976; Parfitt, 1977).

The Lamaze method actively employs the technique of psychoprophylaxis, which is defined as "... prevention of pain by psychological means" (Parfitt, 1977, p. 46). However, this technique does not refer to childbirth without pain, but to a trained and conditioned response to the contractions which can reduce the level of the mothers' pains and discomforts. The Lamaze method is based on the same type of conditioned response which Ivan Pavlov used with dogs (see Figure 1). When the brain receives a stimulus, it must find a response. A contraction is a stimulus which is either interpreted as pain or a signal to work, depending on whether mothers are untrained or trained in Lamaze, respectively (Lamaze, 1965).

Uterine contractions and pain are two separate phenomenon that need not be associated. "Pure" pain in a physiological sense is non-existent. Pain can be defined as "... a complex cerebral process made up of many components" (Lamaze, 1965, pps. 55-56), which is to say that for pain to be experienced physically, the brain must recognize and label it as such. When the brain is maintaining a high level of cortical activity at the moment of painful stimuli, it is "too busy" to recognize the pain. An everyday example of pain inhibition can be
Figure 1. The use of classical conditioning in the Lamaze preparation method of childbirth.

UCS = unconditioned stimulus: always elicits a certain response

UCR = unconditioned response; always elicited by the UCS

CS = conditioned stimulus; neutral at first in that it does not elicit same response as UCS until it has been paired with the UCS

CR = conditioned response; response elicited by CS after repeated pairing of the CS with the UCS

In Pavlov's classic experiments, it was noticed that each time food (UCS) was presented to a dog, the dog salivated (UCR). The UCS was then paired with the sound of a bell and again, the UCR was elicited. After several pairings of the UCS and the CS (food and bell, respectively), the dog was conditioned to expect food whenever the bell was rung. Within time, the presentation of the CS alone was enough to produce salivation of the CR.

In this manner, mothers are conditioned to perceive contractions as a time to work through relaxation and utilize their breathing techniques. After six weeks of pairing the CS with the CR, the response to relax and breathe (UCR) becomes automatic.
seen in the person with a headache. As long as the person is involved in an activity that demands full attention, the headache is not recognized and pain is not experienced. But, given the chance to think about the headache, pain will be experienced.

The Lamaze method makes it quite clear how important the psychological state of mind is during labor. Lamaze (1965, p. 54) states: "A word is a sound that carries a meaning. It is this very meaning which determines the nature of the conditioned reflex it has started." Stated differently, words and their meanings stand for objects themselves. Therefore, these words become signals in and of themselves which influence a person's reflex or response to the object. For this reason, contractions are never referred to as "pain" (Bean, 1974; Bing, 1977; Lamaze, 1965; Parfitt, 1977).

Lamaze-trained mothers employ techniques to maintain a high level of concentration and thus avoid the experience of pain by refusing to acknowledge its existence. Attention-focusing, controlled breathing, and effleurage, defined by Parfitt (1977, p. 50) as a "... light, circular massage of the lower abdomen," are used throughout labor and delivery to maintain muscle relaxation, prevent fatigue and avoid uterine muscle spasms. Any pain experienced by a woman during
her actual labor and delivery is dependent on how she understands and practices for her labor both physically and psychologically (Bean, 1974; Bing, 1977; Ewy & Ewy, 1976; Lamaze, 1965; Parfitt, 1977).


It appears that the experimental groups of mothers studied are a self-selecting, homogenous group. Mothers opting for Lamaze preparation are more likely to have a higher socioeconomic status (SES), greater income and a higher educational level than their non-Lamaze counterparts. In addition, Lamaze mothers as compared to non-Lamaze mothers, are more likely to be Caucasian and older in age. Lamaze fathers are more likely to have higher levels of education and higher occupational status than non-Lamaze fathers. Religion was not found to be a factor in the selection of childbirth education (Cave, 1978). Those mothers maintaining a high status level,
perceiving themselves as having a close marriage and adhering to less traditional sex roles also seem to be more motivated to participate in childbirth preparation (Norr, et. al., 1977). Thus, there does seem to be clear evidence supporting the proposition that Lamaze participants do come from a specific segment of the total population.

The principles taught in the Lamaze method are utilized during the process of childbirth. As might be speculated, those mothers participating in a Lamaze birth had better self-control during their labor and delivery than those mothers not having a prepared childbirth (Huttel, et. al., 1972).

Lamaze mothers experienced a significantly higher percentage of spontaneous deliveries; i.e., a delivery without the use of forceps, in comparison to control group mothers -- 62.8 and 36.4, respectively. This difference may be due to individual patients' wishes, variance in the patients' cooperation at the time of delivery and/or a greater use of anesthesia among the control group (Scott & Rose, 1976). Another important factor might be that those mothers experiencing a Lamaze birth had average labor durations which were one to three hours shorter than the control group. This finding did not reach statistical significance (Huttel, et. al., 1972; Hotchner, 1979).
However, Zax, et. al., (1975) present contrary evidence in their study that revealed a mean labor duration of one hour longer for Lamaze mothers. There were no significant differences between the prepared and non-prepared groups concerning the number of mothers who received episiotomies (Scott & Rose, 1976).

The presence of fathers in support roles is a sole significant factor in the mothers' degree of participation during delivery (Norr, et. al., 1977). The fathers' presence, in and of itself, was not a hinderance to the mothers or the medical staffs during labor and delivery (Huttel, et. al., 1972). More importantly, their presence and active support increased the mothers' levels of enjoyment of the birthing process, contributing strongly to the women's perceptions of a "peak" experience, and, overall, contributed to a more positive childbirth experience. Thus, the couple moves through childbirth together creating a "sense of family" at the moment of birth (Huttel, et. al., 1972; Norr, et. al., 1977; Tanzer, 1976).

Both Lamaze and control groups were comparable in the amount and degree of maternal ante-partum and post-partum complications and the number of dysfunctional labors. Comparable rates also exist in the cases of intra-partum fetal distress, mean birth weight, Apgar scores and infant morbidity (Scott & Rose, 1976). Huttel, et. al., (1972)
found no significant differences between the two groups on medical practices, SES variations, anxiety, extraversion or neuroticism scores. On the basis of such evidence, it has been concluded that the techniques utilized by the Lamaze method are not harmful to the mothers or the infants, and may, in fact, be helpful to them (Scott & Rose, 1976).

One of the primary advantages for mothers experiencing a Lamaze birth is their ability to tolerate labor and delivery with the administration of lesser amounts of analgesia and anesthesia, in comparison to mothers experiencing a non-Lamaze childbirth (Huttel, et al., 1972; Scott & Rose, 1972; Tanzer, 1976; Zax, et al., 1975). The principal difference between mothers participating in Lamaze childbirths and mothers in the control group is that the Lamaze mothers received lesser to no amounts of analgesia or anesthesia before the actual delivery. Their total narcotic dose was also less. When anesthesia was administered to Lamaze mothers, it was usually in the form of a pudendal block for delivery and a local anesthetic for an episiotomy, as compared to the frequent use of regional anesthesia for the control mothers (Scott & Rose, 1976).

This increased pain tolerance is simply due to the fact that the Lamaze mothers experienced less pain and could, therefore, tolerate it for a longer duration.
Hence, there is an inverse relationship between pain experiences and pain tolerance. The mothers that had a higher tolerance had fewer thoughts of pain due to active mental or psychological strategies which produce analgesic effects. The pain tolerance and decreased pain perception was not due solely to motivational or other factors (Stevens, 1976, 1977; Stevens & Heide, 1977).

The studies conducted by Stevens (1977) and Stevens and Heide (1977) which compared basic relaxation, attention focusing and attention focusing plus feedback relaxation, showed attention focusing plus feedback relaxation to be the most effective childbirth technique for achieving pain reduction and pain endurance. The more practice the subjects received with this technique, the greater reduction of pain perception and the greater effectiveness in pain management demonstrated. While the technique of basic relaxation produced equal pain endurance, it was not as effective for pain reduction. Thus, the most complex strategy was the most effective; i.e., more mental activities for concentration keeps one from thinking about pain (Stevens, 1977; Stevens & Heide, 1977).

Since the Lamaze technique of psychoprophylaxis closely resembles attention focusing plus feedback relaxation, it can be concluded that Lamaze produces true psychoanalgesia and as such can be an adequate
substitute for or can substantially supplement the use of chemical analgesics and anesthetics. In Lamaze, the addition of breathing techniques to focused attention makes the technique more complex and may possibly increase the level of psychoanalgesia, while feedback provided by the father-coaches is vital in achieving optimal effectiveness of relaxation (Stevens, 1977; Stevens & Heide, 1977).

Pain and enjoyment are distinct but related concepts. Those mothers who were encouraged to prepare for childbirth experienced a higher level of enjoyment than control mothers due to a decreased pain perception as a function of the employment of effective pain control techniques. The control mothers who did not have the techniques in their repertoire had more painful experiences and received more medication, thus decreasing the level of enjoyment (Norr, et. al., 1977). Additionally, since the educated mothers had experiences more closely approximating their "ideal", their self-image was also enhanced (Tanzer, 1976).

Due to the various elements constituting Lamaze or prepared childbirth, it has been speculated that such prepared mothers will form greater degrees of attachment to their infants. The level of knowledge concerning labor and delivery seems to affect maternal-infant attachment, since with the knowledge of what can realistically be
expected during childbirth, mothers may have less need for obstetrical medication, less anxiety about labor, delivery and their maternal roles and less difficulty in establishing reciprocal maternal-infant attachment (Sugarman, 1977). Nevertheless, Zax, et. al., (1975) has failed to support the belief of decreased anxiety among Lamaze prepared mothers.

Among animals, any deviation from the usual course of birth and the environment in which it is experienced can interfere with maternal attachment toward the offspring. While it is true that in the past our society has placed mothers in an unnatural setting for the childbirth process, this practice has begun to change -- with prepared mothers receiving a much less artificial environment in which to deliver their infants (Arms, 1979; Sugarman, 1977).

With pregnancy and delivery being a crisis, it is important that laboring mothers have support from at least one person in proximity that they care about and who cares about them. It is important to realize that professionals alone cannot substitute for this vital emotional support. Such support is an element that Lamaze childbirth provides (Brazelton, 1976; Hotchner, 1979; Sugarman, 1977).

Lamaze increases the mothers' ability for choice in their delivery and increases their feelings of being
in control. This is achieved both through knowledge and a decreased utilization of medication. It is believed that anything which strengthens the feelings of autonomy during childbirth will ultimately strengthen the future maternal role (Brazelton, 1976; Hotchner, 1979).

Doering and Entwisle (1975) have shown that the higher the level of preparation mothers have for childbirth, the higher their levels of awareness at delivery. This is strongly correlated with positive reactions of the mothers toward their delivery experience and their infants. Lamaze training, per se, is highly associated with this level of awareness. Therefore, Lamaze preparation creates a higher awareness level which in turn creates positive maternal reactions toward the infant at birth. Lamaze training appears to be solely responsible for the majority of observed attitudinal differences, although motivation matters slightly. Newton and Newton (Klaus & Kennell, 1970) state that mothers are more accepting and pleased with their infants during the initial contact if these mothers had remained calm and relaxed during labor, cooperated with and had good rapport with their attendants and received solicitous care. Mothers with more positive reactions to their infants maintained a closer mother-infant relationship in the
immediate postpartum period. Such evidence would seem to point to a stronger maternal-infant attachment (Doering & Entwisle, 1975).

However, Arms (1979) raises a vital question concerning Lamaze training in relation to maternal-infant attachment: Through their training, Lamaze mothers are theoretically detached from the sensations, smells, and sights of their own bodies during the entire birthing process because they are involved in a controlled distraction activity through inhibition of painful stimuli to the brain (Arms, 1979). It seems logical then, that such distractions could adversely influence the attachment process.

Summary

Of the number of childbirth education classes available, the Lamaze method is the most frequently attended (Parfitt, 1977). These classes help to facilitate bonding since they begin in the prenatal period to condition the mothers' attitudes toward childbirth in a positive direction, both through information and support. Although Lamaze is not childbirth without pain, the degree of pain experienced is decreased as this method utilizes a combination of techniques which effectively focus the mothers' mental activities away from any pain and directs it toward their immediate tasks. These conditioned responses, along with the support of the
fathers, create a positive birthing experience. Lamaze preparation also decreases the probability of medication during labor and delivery, therefore ensuring more mentally alert mothers and infants who are capable of responding to each others' interaction attempts. Nevertheless, the basic question, of whether or not a prepared childbirth per se affects maternal-infant attachment, remains.
CHAPTER 3

METHODS

Sample

The total sample (N=61) consisted of mothers who were admitted to two hospitals in Dubuque, Iowa during the period of data collection. Due to time constraints, data collection was restricted to a nine week period which limited the sample size. Since the purpose of this study was to specifically measure the degree of maternal-infant attachment, information on paternal-infant bonding was not collected.

The sampling procedure was as follows. Mothers were placed into the experimental (N=45) or control group (N=16) depending on their childbirth education experience. Mothers who had received a Lamaze childbirth education experience comprised the experimental group, while mothers who had received no childbirth education classes comprised the control group. Due to the nature of this study, complete randomization was impossible since the mothers choosing or not choosing to participate in childbirth education classes formed self-selecting groups. However, once the childbirth education vs. no childbirth education groups were formed, it was possible to randomly select
the sample population by approaching only four of every five qualifying mothers from each group for possible participation in the study.

The sample population consisted solely of primiparous (i.e., having given birth to their first child), as opposed to multiparous (i.e., having given birth to more than one child), mothers to control for previous childbirth and parenting experiences. Such previous experiences may decrease anxiety associated with the "unknown" facet of childbirth, which in turn, might influence the degree of attachment. Mothers who experienced conditions which might positively affect the bonding process: e.g., rooming-in, and conditions which might negatively affect the bonding process: e.g., prenatal and/or delivery complications were not included in the study.

These were mothers of well-babies. A well-baby was defined as a full-term infant that was neither in the intensive care nor intensive observation nurseries and which had no discernable physical deficiencies or deformities. Mothers of ill and/or deformed babies must cope with some special infant care which might increase the psychological stress experienced by the mothers. Klaus and Kennell (1976a) state that any factor which hinders maternal-infant interaction to any extent will most certainly have an effect on the bonding process.
The marriage factor was controlled, with only married mothers participating in the study to prevent the inclusion of any additional emotional and psychological stress which might be experienced by unwed mothers. Since SES may have affected the amount of crisis perceived by mothers toward childbirth, thereby affecting the attachment process, all mothers were classified by their SES, as determined by approximate annual income, highest level of education attained and the occupation held. These categories were based on the rating scale outlined by McQuire and White (1955; see Appendix A) and were in accordance with Cave's (1978) findings on the characteristics of Lamaze and control participants. The demographic characteristics of the sample mothers are located in Table 1.

Measures

The variable of maternal-infant attachment was measured with the Neonatal Perception Inventory (NPI) (Broussard & Hartner, 1971; see Appendix B & C). The NPI has been used extensively by Klaus and Kennell (Liu, 1978) in their maternal-infant bonding research. The NPI measures maternal perceptions of their infants as compared to the image of average infants and takes approximately five minutes to complete. On the first or second postpartum day, the NPI was given to the mothers. The author served as the data collector and research assistant throughout
Table 1
Demographic Characteristics for Experimental and Control Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (45)</th>
<th>Control (16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual income (in dollars)</td>
<td>24,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Years married</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Minutes with infant at birth</td>
<td>45 - 60</td>
<td>45 - 60</td>
</tr>
<tr>
<td>Wife's education</td>
<td>2 years college</td>
<td>High school</td>
</tr>
<tr>
<td>Husband's education</td>
<td>College graduate</td>
<td>High school</td>
</tr>
<tr>
<td>Wife's occupation</td>
<td>White collar</td>
<td>Blue collar</td>
</tr>
<tr>
<td>Husband's occupation</td>
<td>White collar</td>
<td>Blue collar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (45)</th>
<th>Control (16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Husband present at birth</td>
<td>98</td>
<td>100</td>
</tr>
<tr>
<td>Lamaze preparation</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

aN Numbers in parentheses indicate the number of mothers in each group.
this research project. The mothers were given the following instructions by the research assistant:

I am interested in learning more about the experiences of mothers and their babies during the first few weeks after delivery. The more I can learn about mothers and their babies, the better I will be able to help other mothers with their babies. I would appreciate it if you would help me to help other mothers by answering a few questions.

The NPI was administered again at approximately one month postpartum. The procedure for administering the Average Baby Form of the NPI at time one and time two was identical. Upon handing the mothers the Your Baby Form at time one, the research assistant said: "Although this is your first baby, you probably have some ideas of what most little babies are like. Will you please check the blank you think best describes what most little babies are like." At time two, the research assistant said: "You have had a chance to live with your baby for a month now. Please check the blank you think best describes your baby."

The Average Baby Form (see Appendix B) gives the mothers' perceptions of what the average baby is like, while the Your Baby Form (see Appendix C) gives the mothers' perceptions of what their babies will be like (time one) or are like (time two). On each form there are six items to be checked on a scale of five degrees ranging from "none" to "a great deal". Each degree is assigned a value,
with "none" receiving the value of +1 and "a great deal" receiving +5. Thus, a total score is received for the Average Baby Form and the Your Baby Form, with no attempt to weigh the scales for each of the inventories separately. The total score of the Your Baby Form is subtracted from the scores of the Average Baby Form. This difference constitutes the NPI score. Thus, one month old infants with mothers who rated them as better than average, as evidenced by a positive score, are considered Low Risk. Infants not rated as better than average at this time (0 or a negative score) are considered High Risk for later development. The NPI has both construct and criterion validity (Broussard & Hartner, 1971).

A Behavior Assessment Interview (BAI) (Liu, 1978; see Appendix D) consisting of ten open and closed questions, was used to assess infant care and behavior, as well as maternal perception toward their infants. The BAI took approximately fifteen minutes to complete.

The Degree of Bother Inventory (Broussard & Hartner, 1971; see Appendix E) assesses infant behavior problems. There are four degrees assigned to each of the six items on the inventory. Each degree is assigned a value ranging from +1 to +4 with "none" receiving a +1 and "a great deal" receiving a +4. The scores are totaled with no attempt to weigh the items separately. Thus, the
possible range in scores is 6-24. There is high face validity associated with the Degree of Bother Inventory (Broussard & Hartner, 1971). The Inventory took approximately five minutes to complete.

The BAI and the Degree of Bother Inventory were examined in the case of a High Risk score at one month of age. In this manner, any persistent areas of stress, which may have accounted for a lowered bonding score could be taken into consideration. Such continued monitoring and detection may be important for intervention purposes if the bonding process is to be continued optimally once it is initiated.

Procedure

Physician's consent was granted to interview each qualifying mother (see Appendix F). After the mothers were introduced to the research assistant and had read the consent form (see Appendix G) outlining the purpose of this study and had agreed to participate in this study, the descriptive background information (see Appendix H) was obtained and the Your Baby Form and the Average Baby Form administered. In addition, the number of minutes the mothers had spent with their infants at birth was recorded. The type and dosage of medication received during labor was obtained from the mothers' medical charts.
The initial interview with the mothers lasted approximately fifteen minutes.

At one month postpartum, the follow-up Your Baby Form, the Average Baby Form, the BAI and the Degree of Bother Inventory was mailed to the mothers, along with a self-addressed, stamped envelope and a letter thanking them for their cooperation. Ideally, this follow-up should have been administered with a personal interview; however, such a procedure was not feasible in this study. Fifty-seven of the mothers (93 per cent) returned the completed information (n=43 experimental, n=14 control) and were included in the data analysis.
CHAPTER 4

RESULTS

In order to determine the effects of no childbirth education experience vs. Lamaze treatment on maternal-infant attachment, a two-tailed t-test was conducted on the mean scores for the experimental and control groups on the NPI scores at time one and time two. The results indicated significantly higher NPI scores at time two, \( t(24) = -3.26, p < .05 \) for the control mothers in comparison to the experimental (Lamaze) mothers. The means and standard deviations for the two groups are located in Table 2.

Because of the relative importance of medication on the attachment process (Parfitt, 1977; Tanzer, 1976; Yang, et al., 1976; Zax, et al., 1975), medication was examined more closely for its possible role in relation to the results. Since a chi-square statistic found that the Lamaze mothers had taken significantly larger dosages of narcotic medications during labor, \( \text{chi-square} (3) = 11.82, p < .01 \), further analysis was conducted investigating the possible effect of medication as an intervening variable on the two groups in relation to the NPI score. Lamaze mothers were matched to the control mothers on the
Table 2. Means and Standard Deviations for the Lamaze and Control Groups on the Neonatal Perception Inventory.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Baby Score--1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (43)</td>
<td>17.05</td>
<td>1.86</td>
</tr>
<tr>
<td>Control (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Your Baby Score--1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (43)</td>
<td>16.02</td>
<td>2.21</td>
</tr>
<tr>
<td>Control (14)</td>
<td>15.00</td>
<td>3.43</td>
</tr>
<tr>
<td>Average Baby Score--2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (43)</td>
<td>15.88</td>
<td>1.93</td>
</tr>
<tr>
<td>Control (14)</td>
<td>16.57</td>
<td>2.24</td>
</tr>
<tr>
<td>Your Baby Score--2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (43)</td>
<td>13.88</td>
<td>3.26</td>
</tr>
<tr>
<td>Control (14)</td>
<td>12.14</td>
<td>2.25</td>
</tr>
<tr>
<td>NPI--1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (43)</td>
<td>1.02</td>
<td>1.42</td>
</tr>
<tr>
<td>Control (14)</td>
<td>.71</td>
<td>2.05</td>
</tr>
<tr>
<td>NPI--2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental (43)</td>
<td>2.00</td>
<td>2.52</td>
</tr>
<tr>
<td>Control (14)</td>
<td>4.43</td>
<td>2.38</td>
</tr>
</tbody>
</table>
basis of types and dosages of medications. From these matched groups, Lamaze mothers were randomly selected to form a Lamaze and control group of equal size. Even when taking medication into account, the control group still exhibited significantly higher NPI scores, \( t(26) = -2.59, p < .05 \). Due to the differences between the Lamaze and control groups on the demographic variables, the above procedure was employed in order to test each of the demographic variables as to their roles in relation to the NPI scores. As with the medication variable, none of the demographic variables were found to be causally related to the NPI scores.
It was hypothesized that mothers who participated in a Lamaze prenatal childbirth education class would exhibit a higher degree of maternal-infant bonding than mothers who did not participate in a childbirth education class. The results of the NPI scores taken at time one revealed that the Lamaze mothers scored slightly higher on the NPI than did the control mothers, although the results did not reach statistical significance. Contrary to the hypothesis, the mothers who received no childbirth preparation scored significantly higher on the NPI at time two than did the Lamaze mothers, thus indicating a lower maternal-infant attachment for the Lamaze mothers as compared to the control mothers. These results suggested that, if anything, Lamaze preparation may be adversely affecting the maternal-infant relationship.

There are several factors which may explain these results. First, trained mental distraction may hinder the attachment process. As Arms (1979) has suggested, since the Lamaze mothers are involved in the mental activities of attention focusing and controlled breathing to decrease the experience of pain, these mothers are inherently
distracted from their own bodies during the childbirth process. This distraction created the need for coaches who have trained with the mothers for approximately six weeks prior to the birth so that the mothers become attuned to the coaches' voices, which, in turn, allows each of the mothers to automatically respond to their coaches' commands without interrupting their focused attention. This attention could be focused on anything, such as one spot on the wall, just as long as the focus is not the pain associated with the labor contractions. The mothers stay "one step ahead" of these contractions by following their coaches' commands, rather than becoming involved with their physical sensations could create a similar detachment from the childbirth process per se. Considering the fact that the entire purpose of such a process is to give birth to an infant, any attention focused away from the childbirth process conveys detachment from the infant as well. If the birthing process itself is an important factor in determining the pattern of maternal-infant attachment (Broussard & Hartner, 1971; Peterson & Mehl, 1978), then the act of not specifically attending to the birth of the infant could, therefore, detract from the attachment process.
The control mothers, however, have not been trained to detach their minds from the physiological process of childbirth. Hence, these mothers are not only aware in the sense that they are conscious, but they have a total awareness of the experience—the sensations, sights, smells, sounds and emotions involved with childbirth. Thus, sensory awareness in the important ante-partum period may possibly enhance and optimally accelerate the attachment process. By being aware of their infants throughout labor and delivery, these mothers may also be more likely to be aware of them immediately postpartum during the sensitive period for attachment. Such awareness would seem to be important, not only for facilitating the attachment process per se, but for creating more effective communication via successful reciprocal interaction attempts. Thus, the control mothers have not received "detached focus" training which may allow them to be more aware of and attend to their infants during the ante-partum and immediate postpartum period which would suggest the opportunity for the occurrence of greater attachment.

Second, expectations toward labor and delivery, which have developed throughout pregnancy, may affect maternal-infant attachment. Perhaps the Lamaze mothers' childbirth experiences did not meet their expectations for the ideal labor and delivery. For example, since
a principle of the Lamaze method is to complete childbirth with less pain experienced and, therefore, less medication utilized, a mother who has merely taken a local anesthetic may feel guilty and view herself as a failure concerning her participation in the childbirth process. The feelings of guilt possibly resulting from the self-perceptions of failure can cause a state of postpartum depression. These mothers must adjust their self-concepts from the image of being "perfect mothers" to one which coincides realistically with their childbirth experiences. Such a depression or difficulty in adjusting to their disappointments and any negative feelings can hinder the attachment process (Bibring, et. al., 1961; Brazelton, 1963; Nott, et. al., 1976; Tanzer, 1976).

In contrast, control mothers may have been more satisfied with their childbirth experiences overall. This satisfaction could result from several factors, such as shorter labor durations, perceptions of better maternal care from the staff, or more realistic expectations for childbirth. Greater satisfaction with childbirth may be associated with greater satisfaction of and positive reactions to their infants. Since a healthier adjustment to the crisis of childbirth indicates greater freedom to express maternal roles (Bibring, et. al., 1961; Brazelton, 1963; Flapan & Schoenfeld, 1972), the control
mothers may have been less restricted concerning their interaction attempts with their infants. Such freedom could produce greater success with reciprocal interaction such that these mothers were more willing to stimulate their infants in order to receive stimulation back in the form of adult social communication behaviors, such as smiling and eye contact, which are factors that facilitate the attachment process (Robson & Moss, 1970).

Third, since the Lamaze mothers were a self-selecting group, they may have been characterized by a specific factor which caused them to attend childbirth education classes. Lamaze preparation may attract those mothers who are initially more fearful concerning childbirth. By the end of pregnancy, this fear may be concentrated on the fetus (Brazelton, 1963) which could lessen any positive reactions toward the neonates. Any fear can stimulate the fear-tension-pain cycle which, when in effect, can minimize the attachment process by decreasing the mothers' perceptions to a positive childbirth experience.

If the control mothers initially had a level of fear substantially below that of the Lamaze mothers, these fears may remain substantially lower than the Lamaze mothers' even after the effect of the childbirth training. This lower level of fear and anxiety by the control
mothers could have facilitated greater attachment by allowing the childbirth experience to proceed in a more relaxed and positive environment.

Fourth, since childbirth has never been experienced by the primiparous mothers studied, the differences between the Lamaze and control mothers may have been due to their differential perceptions of the excitement involved when encountering a novel situation. The control mothers may have maintained the aura of mystique surrounding childbirth. By not studying the childbirth process with the intensity of those mothers enrolled in Lamaze preparation, the control mothers may have augmented the excitement associated with such an adventurous experience as birth. In accordance with this excitement, childbirth may have been perceived and experienced in a more romantic and positive light. Just as knowing what one will receive for Christmas can decrease the enjoyment received when the packages are finally opened, so too may preparation decrease the enjoyment associated with childbirth. As with many academic studies, the subject area of childbirth may have become dull, boring and routinized for Lamaze mothers to the extent that childbirth was perceived with less emotionality on the part of the mothers. Therefore, maintaining the mystique regarding childbirth may have resulted in greater maternal-infant attachment by
allowing control mothers to experience more anticipatory excitement, and to view the process through rose-colored glasses, making it a more positive and satisfying experience in which to become acquainted with their new infants.

Finally, the hospital practices themselves may have contributed to the control mothers' greater attachment to their infants. Both hospitals involved in this study followed the same basic childbirth procedure which allowed mothers to have their husbands present during labor and delivery, to spend time alone as a family unit during the sensitive period, and to exhibit some degree of autonomy during the labor and delivery. These practices gave these mothers the chance for the same experiences as the Lamaze mothers, such as a "peak" experience. More importantly, however, such practices may have had a greater effect on the control mothers' positive perceptions of their satisfaction with childbirth. Unlike the Lamaze mothers, who, through their training, have come to view these procedures merely as functional components of a childbirth experience to which they are justly entitled, control mothers may have expected a more fundamental childbirth reminiscent of a decade ago when the fathers were still banished to the maternity waiting room. In this sense, these unexpected practices may have seemed more special and less taken for granted by the control
mothers, thereby contributing to the romantic vision and enhancing maternal-infant attachment.

In addition, the similarity between the two groups of mothers concerning the hospital routines during childbirth may explain not only the greater maternal-infant attachment for the control mothers, but also why the results of this study do not coincide with previous findings comparing Lamaze with control mothers. The majority of these previous studies observed control mothers who typically experienced the standardized obstetrical practices, including no husbands present during labor and/or delivery and the infants immediately taken from the mothers for laboratory tests immediately following birth. As these hospital procedures deviated from those normally practiced in the majority of hospitals today, it is possible that this study more directly compared the attachment of Lamaze vs. control mothers to their infants, while previous studies may have inadvertently investigated the differences of hospital procedures for the two groups of mothers.

In summary, five possible explanations for significantly greater maternal-infant attachment for control, as compared to Lamaze, mothers have been given: (1) control mothers have greater sensory awareness throughout the childbirth process, (2) control mothers were generally more satisfied with their childbirth experiences,
(3) control mothers entered childbirth with substantially less fear and anxiety, (4) control mothers maintained the mystique of childbirth, and (5) control mothers received what could be considered as special hospital procedures. These five explanations may have enhanced attachment by creating more positive childbirth experiences and, hence, greater positive reactions to the infants. This is not to say, of course, that no attachment formed between the Lamaze mothers and their infants, but that this attachment remained minimal while the maternal-infant attachment in the control group was greatly enhanced.

**Limitations and Implications for Future Research**

Due to the time constraints involved with data collection and the fact that the majority of mothers in the region studied attended childbirth education classes, the primary limitation of this study is the small sample size. This reduced sample size does not allow for comparisons between childbirth education classes/instructors and combined with the fact that all of the mothers studied were from the same geographic location, this limitation places restraints on the generalizability of results. At this time it is difficult to conclude if these results are valid for control and Lamaze mothers in general,
solely for the mothers within one particular region or only for this specific sample.

The factors of labor duration and hospital procedures were not controlled for within the methodological design. Instruments measuring maternal fear and/or satisfaction in relation to the childbirth experience and their effect on maternal-infant attachment were not employed. Direct observation, for the purpose of observing the quality of maternal-infant interaction, was also not utilized. Again, time constraints made such observations impossible. No pre-test was given to establish a comparison between the experimental and control groups before the treatment of childbirth education was imposed.

In the future, a replication of this study needs to be accomplished with a larger sample size in order to increase the generalizability of results. In addition, a larger sample size will be necessary to implement a complete evaluation of the different classes/instructors used by the mothers. In this manner, it might be determined not only if different theoretical frameworks; e.g., Lamaze, Bradley, etc., have different effects on maternal-infant attachment, but what roles different classes within a particular framework play on influencing the attachment process.
It would appear that fear and satisfaction may operate at different levels between the experimental and control groups, thus having an indirect effect on attachment. Instruments that specifically measure these factors should be employed. A pre-test should be conducted in order to record any differing characteristics on such variables as attitudes toward pregnancy and childbirth between the two groups of mothers. Not only can the pre-test determine what motivates certain mothers to enroll in childbirth education classes, but it may also allow the researcher to notice any attitude fluctuations as a result of these classes which could influence attachment. Another measure of satisfaction should be taken immediately postpartum so that any intervening variables on satisfaction, including labor duration and hospital procedures, may be taken into account in drawing any conclusions. While this study has taken an initial step in attempting to determine the role of childbirth education and maternal-infant attachment, further research needs to be conducted to clarify this relationship.
APPENDIX A

EDUCATIONAL ATTAINMENT

1. Completed appropriate graduate work for a recognized profession at highest level; graduate of a generally recognized, high status, four-year college.

2. Graduate from a four-year college, university, or professional school with a recognized bachelor's degree, including four-year teacher colleges.

3. Attended college or university for two or more years; junior college graduate; teacher education from a normal school; R.N. from a nursing school.

4. Graduate from high school or completed equivalent secondary education; includes various kinds of "post-high" business education or trade school study.

5. Attended high school, completed grade nine, but did not graduate from high school; for persons born prior to 1900, grade eight completed.

A Note. Adapted from "The Measurement of Social Status" by C. McQuire and G.D. White, Department of Educational Psychology, University of Texas, 1955.
### OCCUPATIONS: LEVELS AND KINDS

<table>
<thead>
<tr>
<th>Rate Professionals</th>
<th>Proprietors</th>
<th>Businessman</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lawyer, judge, physician, engineer, professor, school supt. et.al., with postbaccalaureate study.</td>
<td>Top executive, President, et.al., of corporations, bank, public utilities.</td>
<td></td>
</tr>
<tr>
<td>2. Nurses, teachers, librarians, and others with 4-yr. college degree.</td>
<td>Asst. office &amp; dept. manager or supervisors; some mfg. agents.</td>
<td></td>
</tr>
<tr>
<td>3. Professionals without 4-yr. college degree (usually have a diploma).</td>
<td>Business or equity valued from $10,000 to $50,000.</td>
<td>Managers of small branch- or buyers and salesmen of known mchdse.</td>
</tr>
<tr>
<td>4.</td>
<td>Business or equity valued from $5,000 to $10,000.</td>
<td>(Stenographer, bookkeeper; ticket agent, sales people in dept. stores, et.al.).</td>
</tr>
<tr>
<td>5.</td>
<td>Business or equity valued from $2,000 to $5,000.</td>
<td>(Dime store clerks, grocery clerks, beauty oper., telephone oper., et.al.).</td>
</tr>
</tbody>
</table>

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**Note:** Adapted from "The Measurement of Social Status" by C. McQuire and G.D. While, Department of Educational Psychology, University of Texas, 1955.
### OCCUPATIONS: LEVELS AND KINDS—Continued

<table>
<thead>
<tr>
<th>White Collar</th>
<th>Blue Collar</th>
<th>Service</th>
<th>Farm People</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CPA: editor of newspaper, magazine; executive secy. of status organization.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Accountant; insurance, real estate, stock salesmen; editorial writers.</td>
<td></td>
<td></td>
<td>Land Operators who supervise properties and have an active urban life.</td>
</tr>
<tr>
<td>3. Bank clerks, auto salesmen, postal clerks, RR or Tel. agent or supervisor.</td>
<td>Small contractor who works or supervises his job.</td>
<td></td>
<td>Farm owners with &quot;hired help&quot;, operator or leased property.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Police capt., tailor, RR conj. watchmaker.</td>
<td>Small landowners, operators of rented property hiring &quot;hands&quot;.</td>
</tr>
<tr>
<td>4. Foreman; master carpenter, electrician, et.al., RR engineer.</td>
<td></td>
<td></td>
<td>Tenants on food farms; foreman; owners of farms who &quot;hire out.&quot;</td>
</tr>
<tr>
<td>5. Apprentice to skilled trades; repairmen, med. skilled workers.</td>
<td>Policemen, barbers; LPN's, brakemen.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Domestic help, busboy, scrubwoman, janitor.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

aNote: Adapted from "The Measurement of Social Status" by C. McQuire, and G.D. White, Department of Educational Psychology, University of Texas, 1955.
APPENDIX B

AVERAGE BABY – Time One

Although this is your first baby, you probably have some ideas of what most little babies are like. Please check the blank you think best describes the AVERAGE baby.

How much crying do you think the average baby does?

a great deal  a good bit  moderate amount  very little  none

How much trouble do you think the average baby has in feeding?

a great deal  a good bit  moderate amount  very little  none

How much spitting up or vomiting do you think the average baby does?

a great deal  a good bit  moderate amount  very little  none

How much difficulty do you think the average baby has in sleeping?

a great deal  a good bit  moderate amount  very little  none

How much difficulty does the average baby have with bowel movement?

a great deal  a good bit  moderate amount  very little  none

How much trouble do you think the average baby has in settling down to a predictable pattern of eating and sleeping?

a great deal  a good bit  moderate amount  very little  none

Form A1

Note: From "Further considerations regarding maternal perception of the first born" by E.R. Broussard and M.S. Hartner, Exceptional infant studies in abnormalities (Vol. 2), New York: Brunner/Mazel, 1971. Copyright 1964 by E.R. Broussard, MD. Used with permission.
AVERAGE BABY - Time Two

Although this is your first baby, you probably have some ideas of what most little babies are like. Please check the blank you think best describes the AVERAGE baby:

How much crying do you think the average baby does?

- a great deal
- a good bit
- moderate amount
- very little
- none

How much trouble do you think the average baby has in feeding?

- a great deal
- a good bit
- moderate amount
- very little
- none

How much spitting up or vomiting do you think the average baby does?

- a great deal
- a good bit
- moderate amount
- very little
- none

How much difficulty do you think the average baby has in sleeping?

- a great deal
- a good bit
- moderate amount
- very little
- none

How much difficulty does the average baby have with bowel movements?

- a great deal
- a good bit
- moderate amount
- very little
- none

How much trouble do you think the average baby has in settling down to a predictable pattern of eating and sleeping?

- a great deal
- a good bit
- moderate amount
- very little
- none

Form A2

Note: From "Further considerations regarding maternal perception of the first born" by E.R. Broussard and M.S. Hartner, Exceptional infant studies in abnormalities (Vol. 2), New York: Brunner/Mazel, 1971. Copyright 1964 by E.R. Broussard, MD. Used with permission.
APPENDIX C

YOUR BABY - Time One

While it is not possible to know for certain what your baby will be like, you probably have some ideas of what your baby will be like. Please check the blank you think best describes what your baby will be like.

How much crying do you think your baby will do?

- a great deal - a good bit - moderate amount - very little - none

How much trouble do you think your baby will have feeding?

- a great deal - a good bit - moderate amount - very little - none

How much spitting up or vomiting do you think your baby will do?

- a great deal - a good bit - moderate amount - very little - none

How much difficulty do you think your baby will have in sleeping?

- a great deal - a good bit - moderate amount - very little - none

How much difficulty do you expect your baby to have with bowel movements?

- a great deal - a good bit - moderate amount - very little - none

How much trouble do you think that your baby will have settling down to a predictable pattern of eating and sleeping?

- a great deal - a good bit - moderate amount - very little - none

Form B

Note: From "Further considerations regarding maternal perception of the first born" by E.R. Broussard and M.S. Hartner, Exceptional infant studies in abnormalities (Vol. 2), New York: Brunner/Mazel, 1971. Copyright 1964 by E.R. Broussard, M.D. Used with permission.
YOUR BABY - Time Two²

You have had a chance to live with your baby for about a month now. Please check the blank you think best describes your baby.

How much crying has your baby done?
- a great deal
- a good bit
- moderate amount
- very little
- none

How much trouble has your baby had feeding?
- a great deal
- a good bit
- moderate amount
- very little
- none

How much spitting up or vomiting has your baby done?
- a great deal
- a good bit
- moderate amount
- very little
- none

How much difficulty has your baby had in sleeping?
- a great deal
- a good bit
- moderate amount
- very little
- none

How much difficulty has your baby had with bowel movements?
- a great deal
- a good bit
- moderate amount
- very little
- none

How much trouble has your baby had in settling down to a predictable pattern of eating and sleeping?
- a great deal
- a good bit
- moderate amount
- very little
- none

Form B²

²Note: From "Further considerations regarding maternal perception of the first born" by E.R. Broussard and M.S. Hartner, Exceptional infant studies in abnormalities (Vol. 2), New York: Brunner/Mazel, 1971. Copyright 1964, by E.R. Broussard, MD. Used with permission.
APPENDIX D

Behavior Assessment Inventory

1. How are things going?
2. What are you feeding the baby? How much? How often?
3. How has the baby been sleeping?
   Where does the baby sleep at night? Why?
4. How have the baby's bowel movements been?
5. Are you concerned about anything?
   Have you taken the baby to a doctor since he went home?
6. What is the baby doing that he was not able to do when he went home?
   Does he see? Hear?
7. Does the baby cry a lot?
   When the baby cries and has been fed, and the diapers are dry, what do you do? (pick him up, cry it out, both?)
8. Would you describe your baby as cuddly?
   Do you feel close to the baby?
   Do you feel the baby is yours?
   If yes, when? Delivery_______Hospital_______Home_____
9. Have you gone out without the baby since the baby went home? To the store?_______To friends?_______
   To eat?_______To school?_________Who stayed with the baby?_________________________How did it go?
10. Do you think your baby is spoiled? Do others think that your baby is spoiled (who and what?) Do others spoil your baby (who?) What have others told you will happen if your baby is spoiled?

APPENDIX E

Degree of Bother Inventory

Listed below are some of the things that have sometimes bothered other mothers in caring for their babies. We would like to know if you were bothered about any of these. Please place a check in the blank that best describes how much you were bothered by your baby's behavior in regard to these.

<table>
<thead>
<tr>
<th>Behavior</th>
<th>A great deal</th>
<th>Somewhat</th>
<th>Very little</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crying</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spitting up or vomiting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elimination</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of a predictable schedule</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

^Note: From "Further considerations regarding maternal perception of the first born" by E.R. Broussard and M.S. Hartner, Exceptional infant studies in abnormalities (Vol. 2), New York: Brunner/Mazel, 1971. Copyright 1964 by E.R. Broussard, MD. Used with permission.
To Whom It May Concern,

As a Master's student in the area of Child Development and Family Relations, I would like to work through your hospital in conducting my thesis research entitled, "Childbirth Education: Implications for Maternal-Infant Attachment." Hopefully, this project will determine whether or not childbirth education classes facilitate maternal-infant attachment. All participation in this project is completely voluntary. There are no costs or risks involved with participation in this study. The hospital and physician may benefit from the results of this study in future facilitation of maternal-infant attachment involving their patients.

Attached, please find a copy of the mother's consent form, the questionnaire which will be utilized and a brief description of the project and the methodology which will be employed.

I have read the above statement and the attached documents. The nature, demands and benefits have been satisfactorily explained to me. I hereby agree to cooperate in this research project by making available to the researcher the names of my patients who qualify for this project.

_____________________________   _______________________
Physician's Signature               Date
APPENDIX G
CHILDBIRTH EDUCATION:
IMPLICATIONS FOR MATERNAL-INFANT ATTACHMENT
SUBJECT'S INFORMED CONSENT FORM

To Whom It May Concern:

This questionnaire is part of a research study entitled, "Childbirth Education: Implications for Maternal-Infant Attachment." I am interested in learning more about the experiences of mothers and their babies during the first few weeks after delivery. The more I can learn about mothers and their babies, the better I will be able to help other new mothers with their experiences. I would appreciate it if you would help me to help other mothers by answering a few questions.

Your participation in this study is completely voluntary. Your involvement consists of answering two questionnaires at this time and four questionnaires one month from now. These additional questionnaires will be mailed to you. The completion of the present questionnaires will require approximately five minutes of your time. The questionnaires you will receive one month from now will require approximately one-half hour of your time. There will be no costs or risks to you from your participation in this study. You may benefit from this study by becoming aware of some of the feelings and perceptions you have toward your new baby. You may withdraw from completing the questionnaires at any time, without incurring any ill will. Completion of the questionnaire indicates that you have willingly consented to participate in this study. Be assured that all questionnaires are anonymous and all information will be kept confidential. Your responses will be grouped with the responses of other mothers to provide me with the information I seek. Any information used in locating participants will be destroyed at the conclusion of the study and no record will be kept of your participation in the study.

I thank you for your help in this study. The success of the project depends upon your participation, and I believe you will find it interesting. I will provide you with a summary of the results of the study upon request. If you have any questions concerning this research, please do not hesitate to telephone me at the number listed below.

Candace A. Croft
Master's Graduate Student
2929 E. 6th St. Tucson
(602) 327-3884
APPENDIX H

BACKGROUND INFORMATION

Code No.

Age__________________________ Race__________________________

Childbirth class_________ Where__________________________

Who was present at birth?________________________________________

Years married?________

Approximate time spent with infant immediately at birth:

None_______
1-15 minutes_____  
15-30 minutes_______
30-45 minutes_______
45-60 minutes_______
Greater than 60 minutes_______

<table>
<thead>
<tr>
<th>Education</th>
<th>Wife</th>
<th>Husband</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Wife</th>
<th>Husband</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Income</th>
<th>Wife</th>
<th>Husband</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


McQuire, C., & White, G.D. The measurement of social status. Department of Educational Psychology, The University of Texas, 1955.


