



Effects of various coping strategies (Lamaze vs. biofeedback vs. telling) on relaxation as measured by EMG and finger-tip temperature in nine primiparas
by Margo Marie Caldwell

A thesis submitted in partial fulfillment of the requirement for the degree of MASTER OF NURSING
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Abstract:

The purpose of this study was to determine the effect of various coping strategies for pain (Biofeedback, Lamaze, and Telling) on relaxation as measured by EMG or finger-tip temperature in primiparas.

The sample was obtained from a population of volunteers taking either Lamaze Childbirth Education Classes or Prenatal Education Classes during pregnancy in 1978. The sample consisted of 9 primiparas ranging from 18 to 38 years of age. The population was Caucasian, English-speaking and free of a past history of traumatic pain and obstetric complications.

Rotters I-E Scale was administered to all subjects prior to experimentation. Difference scores were obtained for EMG and fingertip temperature scores.

The data for EMG and finger-tip temperature were subjected to a simple analysis of variance, and significance was determined at the .05 level. Data from EMG and finger-tip temperature were subjected also to the Pearson product moment correlation coefficient to measure their relationship.

It was found that subjects using either Lamaze or Biofeedback achieved significantly lower EMG readings. There was no significant correlation between finger-tip temperature and coping strategy.

The following recommendations were made: 1) Replication with an increased number of subjects.

2) Extension of the research to measurement of pain in the first stage of labor.

3) Extension of the research to explore other techniques said to "help relax" a person such as: yoga, relaxation response, hypno- tism, and guided imagery.

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EFFECTS OF VARIOUS COPING STRATEGIES.
(LAMAZE VS. BIOFEEDBACK VS. TELLING)
ON RELAXATION AS MEASURED BY EMG AND
FINGER-TIP TEMPERATURE IN NINE PRIMIPARAS

by

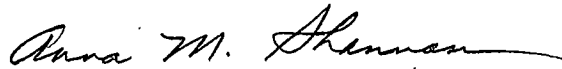
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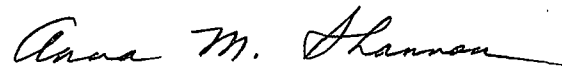
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Chairperson, Graduate Committee



Head, Major Department



Graduate Dean

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ABSTRACT

The purpose of this study was to determine the effect of various coping strategies for pain (Biofeedback, Lamaze, and Telling) on relaxation as measured by EMG or finger-tip temperature in primiparas.

The sample was obtained from a population of volunteers taking either Lamaze Childbirth Education Classes or Prenatal Education Classes during pregnancy in 1978. The sample consisted of 9 primiparas ranging from 18 to 38 years of age. The population was Caucasian, English-speaking and free of a past history of traumatic pain and obstetric complications.

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The data for EMG and finger-tip temperature were subjected to a simple analysis of variance, and significance was determined at the .05 level. Data from EMG and finger-tip temperature were subjected also to the Pearson product moment correlation coefficient to measure their relationship.

It was found that subjects using either Lamaze or Biofeedback achieved significantly lower EMG readings. There was no significant correlation between finger-tip temperature and coping strategy.

The following recommendations were made: 1) Replication with an increased number of subjects.

2) Extension of the research to measurement of pain in the first stage of labor.

3) Extension of the research to explore other techniques said to "help relax" a person such as: yoga, relaxation response, hypnosis, and guided imagery.

Chapter 1

INTRODUCTION

A description of the relationship between the amount of relaxation and the strategies of Lamaze, biofeedback, and instruction, or telling, was the problem selected for study. The design tested the possibility that when a woman is instructed in a method of relaxation, she can relax more effectively than when just told to relax.

Pain is a universal phenomena that has existed since recorded time. The management of pain still poses one of the most challenging problems in nursing (Field, 1974). The relationship between pain perception and the individual's state of relaxation are conceptualized within the gate-control theory of pain. It can be hypothesized within this framework that if a person can relax, his perception of pain will be diminished. This construct has the potential for an impact on nursing, for nurses are involved with pain management with clients of all ages. Nurses, functioning within the framework of the nurse-patient relationship, are in a prime position to help the person relax. The first step toward studying relaxation and pain relief is to look at a group of people with the potential of experiencing pain, and the methods used to reduce pain.

One such group is comprised of pregnant women. The pain of childbirth is so integrated into our culture that the contractions of labor are called labor pains. Pregnant women also constitute a group in which relaxation as a pain relief measure has been explored.

In 1953 Grantly Dick-Read first identified the fear-pain tension syndrome in pregnant women (Gregg, Frazier, Nesbitt, 1975). The Lamaze method of psychoprophylaxis utilizes relaxation techniques such as breathing and a focal point to teach the women a strategy to help them relax. Participants in Lamaze through their subjective response stated that they felt relaxed and that they had some control. The classic technique for relaxation (psychoprophalaxis) when examined shows that the woman has no external measure to show her that she has succeeded in her efforts in relaxation. Biofeedback is one way in which the woman would know that she has relaxed. "Bio comes from biology and makes reference to the neuro-psycho-physiological process of the body." (Gregg, Frazier, Nesbitt, 1975, p.3). Feedback was first coined by Norbert Weiner the mathematician who defined feedback as "a method of controlling a system by reinserting into it the results of its past performance." (Gregg, Frazier, Nesbitt, 1975, p. 3).

A review of the nursing texts (see Appendix A) shows that the nurse's main responsibility was initially the administration of pharmacological agents and to "comfort" the patient. With the inclusion of the gate-control theory of pain into the nursing texts we see more of an emphasis on "encouraging" the patient to relax. None of the texts reviewed gives a specific methodology for encouraging the patient to relax. A review of the literature on pain relief, specifically for noninvasive methods, revealed two in which nursing is involved. These methods are biofeedback and Lamaze childbirth education.

It is crucial to look at existing methods of pain management within the gate-control theory of pain. It can be conceptualized within this framework that to help a person cope with pain it is necessary to provide the person with a strategy which results in muscle relaxation and mental-relaxation or decreased anxiety.

The persons selected for study in the research were pregnant women because of the lack of illness associated with pain in this case (Fagerhaugh and Strauss, 1977). This lack of illness and the required basic prenatal instruction served to reduce fear in this group. This reduced fear is a crucial variable because it has been hypothesized that fear and/or anxiety serve to increase pain perception (Melzack, 1970). Pregnant women also provide a natural population where two methods of teaching relaxation - biofeedback and Lamaze - were already being tried (Caldwell, 1977; Gregg, Frazier, Nesbitt, 1975).

The identification of the strategies for instruction and utilization of relaxation techniques for the control of pain provides a more consistent patient response than "telling" alone. The childbirth regimen includes a very close nurse-patient relationship which lends itself to the Lamaze and/or biofeedback instruction. These methods have implications for potential intervention by the professional nurse who has the daily responsibility of comforting the patient in pain.

PURPOSE OF THE STUDY

This study described the relationship between the amount of relaxation and the strategies used by pregnant women to help them cope with the pain of childbirth. Since the ability to utilize a strategy, or exercise control over one's body, may be related to the individual's locus of control, this variable was considered in relation to relaxation (Johnson and Meyer, 1974). It was the intent of this researcher to hold other factors known to effect the perception of pain, such as, past pain experience, obstetric history, and prenatal education, constant, to isolate the variable, relaxation technique.

STATEMENT OF THE PROBLEM

The purpose of the study was to describe the relationship of various coping strategies (Lamaze vs. Biofeedback vs. Telling) to amount of relaxation in a sample of 9 primipara women volunteers (ages 18-38 years) who were participants in either Lamaze Childbirth Education Classes or Prenatal Education Classes, and to describe the relationship between the subject's locus of control and relaxation.

The methods used to measure relaxation were finger-tip temperature to measure mental relaxation and electromyographic activity to measure muscle-relaxation. The method used to measure locus of control was the Rotter Internal-External Scale.

DEFINITIONSCoping Strategies

Methods used by or with a pregnant woman to increase her relaxation.

Lamaze or Coping Strategy 1 (CS1)

The use of learned breathing patterns and a visual focal point to relax.

Biofeedback or Coping Strategy 2 (CS2)

The use of learned control of muscle activity to relax.

Telling or Coping Strategy 3 (CS3)

The use of verbal instruction as a method of helping to relax.

Relaxation

A manifestation of the psyche and the soma which can be described by physiological measures.

Mental Relaxation

Manifested as heat on the body surface and measured as finger-tip temperature.

Muscle Relaxation

Manifested as electrical activity in the skeletal muscles and measured as electromyographic activity.

Locus of Control

"The degree to which the individual perceives that the reward follows from or is contingent upon, his own behavior or attributes versus the degree to which he feels the reward is controlled by forces outside himself" (Rotter, Phares, and Chance, 1972, p. 243).

OBJECTIVES

The objectives of the researcher were as follows: 1) To evaluate the three coping strategies for the amount of relaxation provided as measured by finger tip temperature readings and EMG readings.

2) To describe the relationship of relaxation readings of women volunteers to their locus of control scores as measured by the Rotter I-E Scale.

HYPOTHESES

H_0 = There will be no significant difference in EMG reading among subjects who use the coping strategies of Lamaze or Biofeedback as compared to those who use the coping strategy, telling.

H_1 = There will significantly lower EMG readings among subjects who use the coping strategies of Lamaze or Biofeedback as compared to those who use the coping strategy, telling.

H_0 = There will be no significant difference in finger-tip temperature readings among subjects who use coping strategies of Lamaze or Biofeedback as compared to those who use the strategy, telling.

H_1 = There will be significantly higher finger-tip temperature readings among subjects who use the coping strategies of Lamaze or Biofeedback as compared to those who use the strategy, telling.

H_0 = There will be no relationship between EMG scores and scores on the Rotter I-E Scale.

H_1 = There will be a positive correlation between EMG scores and scores on the Rotter I-E Scale.

H_0 = There will be no correlation between EMG scores and finger-tip temperature scores.

H_1 = There will be a negative correlation between EMG scores and finger-tip temperature scores.

ASSUMPTIONS

The researcher identified the following assumptions as basic to this study:

- 1) Transfer of learning occurs in all three coping strategies.
- 2) Relaxation can be reinforced and retained.
- 3) All participants will be of equal motivation and capability to relax.
- 4) All women experience pain in childbirth and want to reduce their perception of that pain.

Chapter 2

REVIEW OF LITERATURE

The conceptualization which suggested the problem for study came from a historical review of pain theories including the gate-control theory of pain. This review revealed implications for the nursing management of pain and the need for exploration of pain management. This review constitutes the first section of this chapter.

The second major section contains a review of selected literature pertinent to the choice of the dependent and independent variables.

The third section discusses the intervening variables that the literature suggested, and the resultant design consideration.

PAIN THEORIES

Pain theories, until recently, built upon each other, the next always seeking to explain the clinical evidence inexplicable with the then present theory.

The traditional theories have been specificity theories. Specificity theory is described in virtually every textbook on neurophysiology, neurology, and neurosurgery, and was so deeply entrenched in medical school teaching (until recently) that it was often taught as fact rather than theory (Melzack, 1973). Nursing historically utilized the medical model and also fell prey to this theory-as-fact assumption (Appendix A).

Specificity theory proposes that a specific pain system carries messages from pain receptors in the skin to a pain center in the brain. Muller in 1842 was the first to state this in scientific form, and his statement has become known as the doctrine of specific nerve energies (Melzack, 1961). Goldscheider (1894) built upon former pain theory with empirical evidence from persons with tabes dorsalis. Tabes dorsalis occurs in patients suffering the late stages of syphilis and is characterized by a delayed reaction to a pain stimulus. The delayed reaction led Goldscheider to the conclusion that mechanisms of summation of pain stimuli were essential for understanding the mechanisms of pain. Goldscheider's pattern, or summation theory, proposes that particular patterns of nerve impulses that evoke pain are produced by the summation of the skin sensory input at the dorsal horn cells (Melzack, 1973).

Several theories have emerged from Goldscheider's theory. The simplest form of pattern theory deals primarily with peripheral rather than central patterning (Buytendijk, 1962). That is, pain is considered to be due to excessive peripheral stimulation that produces a pattern of nerve impulses which is interpreted centrally as pain. The theory proposes that all fibers are alike (Buytendijk, 1962). The physiological evidence, however, reveals a high degree of receptor fiber specialization (Melzack, 1973).

Central summation theory also emerged from Goldscheider's theory. As the observations from tabes dorsalis lead from specificity theory to pattern theory, so the analysis of phantom limb pain, causalgia, and neuralgias indicate that part, at least, of their underlying mechanisms must involve the central summation theory (Melzack, 1973). Livingston (1953) proposed that pathological stimulation of sensory nerves (such as occurs in peripheral nerve damage) initiates activity in reverberating circuits in neuron pools in the spinal cord. This abnormal activity can be triggered by normally non-noxious inputs and generate volleys of nerve impulses that are interpreted centrally as pain (Livingston, 1953). Although Livingston's concept and similar central summation concepts have considerable power in explaining phantom limb pain, they fail to account for the fact that surgical lesions of the spinal cord often do not abolish pain (Melzack and Casey, 1968). The neurosurgical (cordotomy and rhizotomy) evidence points to mechanisms in the brain.

A related theory, the sensory interaction theory, states that a specialized input controlling system normally prevents summation from occurring and that destruction of this system leads to pathological pain states (Melzack, 1973). Noordenbo's theory represents an especially important contribution to sensory-interaction concepts. He conceived the small nerve fibers as carrying impulse patterns that produce pain while the large fibers inhibit transmission. He also conceptualized the

the idea of a multi-synaptic afferent system in the spinal cord. This is in contrast to the idea of a straight-through system implied in the specificity theories.

The theory (specificity or pattern) that pain is a sensory modality is relatively recent. The affect theory of pain is much older dating back to Aristotle, who considered pain to be an emotion - the opposite of pleasure. Marshall took an extreme view of pain at the time of Goldscheider. He admitted the existence of a pricking-cutting sense but thought that pain was distinctly different. According to Marshall all sensory inputs, as well as thoughts, could have a painful dimension to them, and he talked of the pain of bereavement, and the pain of listening to badly played music (Melzack, 1973). His extreme view was open to criticism and led to further affect theories. Sherrington (1900) and Titchner (1909) started looking further into the role of affective and motivational processes in pain (Melzack, 1973). Sweet summed up the state of pain theory in 1959, "The assumption that pain is a primary sensation has relegated motivational and cognitive processes to the role of reactions to pain and has made them only secondary considerations in the whole pain process" (Sternbach, 1968).

When one considers the theories examined so far the specific modality and pattern concepts of pain both contain valuable concepts that supplement each other. The affective quality of pain cannot be ignored either. Melzack and Wall (1973) in analyzing the strengths and weaknesses

of the previous theories of pain listed four things any new theory of pain must account for:

- 1) The high degree of physiological specialization of receptor fiber units and of pathways in the central nervous system.

- 2) The role of temporal and spatial patterning in the transmission of information in the nervous system.

- 3) The influence of psychological processes on pain perception and response.

- 4) The clinical phenomena of spatial and temporal summation.

Melzack and Wall (1965) went further, proposing the gate-control theory which attempted to integrate these requirements into a comprehensive theory of pain. Basically, the theory proposes that a neural mechanism in the dorsal horns of the spinal cord acts like a gate which can increase or decrease the flow of nerve impulses from peripheral fibers to the central nervous system. Somatic input is therefore subjected to the modulating influence of the gate before it evokes pain perception and response. The degree to which the gate increases or decreases sensory transmission is determined by the relative activity in large diameter (A-beta) and small diameter (A-delta and C) fibers and by descending influences from the brain (Melzack, 1973). The gate-control theory has important implications for the treatment of pain. It provides a conceptual approach to pain management.

Melzack (1973) suggests that the gate-control theory requires a look at our older methods of treatment (such as successive anesthetic blocks and the use of counter irritation) and a search for techniques to modulate sensory input. Because specificity theory has dominated the field of pain the outcome has been the development of techniques aimed at cutting the so-called pain pathway. The gate-control theory lends credence to the exploration of pain relief through: the pharmacological control of pain on 3 levels, the receptor level, the dorsal horn and other higher levels such as the brain; the sensory control of pain by modulation of input; and the psychological control of pain, through manipulation of anxiety, attention, and suggestion.

THE GATE-CONTROL THEORY: IMPLICATIONS FOR NURSING PRACTICE

When pain theory moved from specificity theories, with their concomitant therapies, to the gate-control theory, the door was opened to the exploration of new methods of pain relief. The gate-control theory holds much promise for the exploration and explanation of non-invasive nursing measures to relieve pain. When pain is conceptualized as 1. perception and response resulting from a stimulus which causes the net output to exceed a critical level, and 2. the output is mediated by a gateing system which is affected by the individual's present and past experiences, the psychological component of pain cannot be ignored. Within this conceptualization McCaffery (1972) lists the following psychological factors as influencing a person's pain sensation: a. emotion-

ally traumatic life experiences, b) past experience with pain, c) knowledge, understanding and cognitive level, d) sense of powerlessness, e) presence, attitudes, and feelings of others, and f) perceived threat of pain to life situation (McCaffery, 1972).

Siegele (1974) speculated about the implications of the gate-control theory to nursing practice as follows:

"Creative approaches have been used in caring for patients in pain using the gate-control theory, especially to alter cerebral processes."

Siegele points out that: establishing a trusting relationship, decreasing anxiety and muscle tension, as well as providing the patients with information enabling them to control their pain, appear to have a conceptual base within Melzack and Wall's theory.

A look at the factors conceptualized as affecting pain perception points the way for the nursing management of pain. Within this framework it appears that the nurse must assess a patient's past experience with pain, with emotional trauma, and the degree of threat the patient perceives this pain to be to his/her life. A history of negative pain experiences, a sense of powerlessness, an emotional trauma and/or a high degree of perceived threat, exhibit themselves in increased anxiety in the patient (McCaffery, 1972). An increase in anxiety within the gate-control theory is seen to increase pain. The areas identified as increasing anxiety and potentiating pain lead to areas of intervention for the nurse. This conceptualization lends credence to, one of the nurse's

major goals in pain management, that is, to intervene in a way to produce decreased tension and anxiety in the patient.

Following this path, the next question the nurse must answer is: what psychological approaches may be able to produce some pain relief through relaxation? Sternbach (1968) suggested that some measure of pain relief is achieved through such techniques as: suggestion, progressive relaxation, the use of strategems to distract the attention of the patient, giving meaning to the situation to the patient, or giving control over the situation to the patient. The mechanisms of cognitive control, physical and mental relaxation, and distraction, mediate the pain stimuli to reduce perception. Theoretically, the application of these techniques should decrease perception of pain (Sternbach, 1968).

INDEPENDENT VARIABLE

A search of the literature was made for methods of promoting relaxation which utilized one or more of the factors described by Sternbach as cognitive factors to reduce pain.

Lamaze, or the psychoprophylactic childbirth method, was identified as one method which appeared to contain cognitive strategems. Lamaze is taught to pregnant women to help them "control the pain of childbirth" through use of a visual focal point, a coach, and a learned pattern of breathing. Lamaze is practiced to achieve relaxation and reduce the pain of labor (Siegele, 1974, p. 500). Consistent with the

gate-control theory it appears that the focal point could be a "distractor", the coach a "reinforcer" and a "positive presence or attitude" (McCaffery, 1972) and the breathing patterns could be a method of reducing tension through muscle relaxation.

A review of the literature on Lamaze and relaxation revealed one study which correlated the use of the technique and resultant relaxation. Klussmon (1975) measured fear and anxiety in 42 primiparas before and after childbirth education classes. Only the Lamaze method of childbirth education succeeded in reducing general anxiety level, as measured by the IPAT Anxiety Scale.

Benson (1972), Field (1974), Dunn (1976), and Stern (1973) acknowledge in their articles the relationship of tension to pain in childbirth. Dunn (1976) speaks of the process: pain in labor is increased by fear of the unknown which manifests itself in lack of confidence, loneliness, waiting for the pain, and muscle tension. He suggests that, in order to modify pain, treatment should be aimed at decreasing muscle tension, increasing confidence, increasing knowledge, and providing distraction (Dunn, 1976). A review of the literature revealed no studies evaluating these variables in relation to pain.

Biofeedback was another method identified by the researcher as containing some of the techniques Sternbach (1968) suggested as providing a measure of pain relief. Biofeedback is defined as providing a person with immediate information about his/her on-going physiological

processes (Ryan, 1975). The information, or feedback, is provided to the subject by means of a light or tone. This method appears to have a focal point or distraction, the light or the tone. Biofeedback also provides the individual with information or "gives meaning to the situation". Biofeedback is utilized to produce relaxation by feeding back electromyographic activity and/or skin surface temperature as a measure of the degree of relaxation (Hauri, 1975). A review of the literature produced one study utilizing biofeedback as a method to reduce tension, and thus reduce pain, in labor.

Gregg, Frazier, and Nesbitt (1975) had as subjects women who had taken Lamaze and instructed them in the use of a home EMG feedback unit. The women were to practice two hours a day. The women in their study used fewer analgesics, anesthetics, and had shorter labors. They also had subjective reports of positive birth experiences.

A third "method" was implied in the literature. Benson (1972), Stern (1973), Field (1974) as well as a variety of nursing texts (Appendix A) repeatedly suggested, "encouraging the patient to relax," "tell the patient to relax". This "method" does fit one criteria of Melzack's (1973) variables known to affect perception. This telling is "suggestion".

In summary, a literature search resulted in support of relaxation as a pain relief measure and revealed three methods that contained one or more of the factors identified by Sternbach (1968) and Melzack (1973) as providing pain relief. It appeared that an exploration of the amount

of relaxation provided by these methods was needed. Thus, the research question took shape: If distraction, suggestion and muscle relaxation are known to reduce pain, and Lamaze, Biofeedback, and Telling, are methods which contain one or more of these factors, does relaxation occur with each? Is there a difference in regard to relaxation among them?

The decision to explore existing methods of producing relaxation to reduce pain led to Lamaze which has as its population pregnant women. If relaxation, as a pain relief measure, was to be studied in pregnant women was there anything unusual about their pain as compared to other pain?

Fagerhaugh and Strauss (1977) discuss the characteristics of birth pain and how it differs from other pain: the pain is expected, has nothing to do with illness, and is finite. Pain which is associated with a high degree of perceived threat to life and which is unpredictable, increases anxiety and pain (McCaffery, 1972). So the characteristics of birth pain appear to make it a pain that is lacking some of the factors known to increase anxiety. Difficult and high-risk births are known to increase fear and anxiety as does the past history or perception that birth will be difficult or high risk (Fagerhaugh and Strauss, 1977).

In summary, pregnant women present a population whose pain has less of an anxiety component if those, with a past history, or fear, of a difficult or high-risk birth, are omitted from the population.

DEPENDENT VARIABLE

If the three previous strategies (Lamaze, Biofeedback, Telling) were to be evaluated for the amount of relaxation, it was necessary to conceptualize relaxation in a way that pointed to methods of measurement.

Relaxation has been conceptualized as having two components, muscle relaxation and mental relaxation (Hauri, 1975).

The measurement of tension in a muscle is done by electromyography (EMG). EMG induced relaxation has been used in the treatment of a wide range of anxiety and tension related problems such as: tension headache, chronic alcohol abuse, chronic anxiety and birth pain (Hauri, 1975; Haynes, et.al., 1975; Townsend, et.al., 1975; Gregg, et.al., 1975; Sternnon, 1975; Breeden, et.al., 1975; Putt, 1979).

Mental tension, or conversely, mental relaxation, also has a physiological measure, skin temperature. The cardiovascular mechanisms which regulate skin temperature in the hands are closely tied with the activity of the sympathetic division of the autonomic nervous system (Ganong, 1975). The feeding back of temperature readings and reinforcement of increases in temperature have been used as a method to achieve relaxation (Reinking, et.al., 1975; Hauri, 1975). French, Leeb and Boernes (1973) support the use of finger-tip temperature feedback with prepared childbirth training as a method to produce relaxation. Work in their laboratory indicated that a significant decrease in temperature was associated with a decrease in relaxation.

In summary, a review of the literature supported the conceptualization of the dependent variable, relaxation, as being manifested in muscle relaxation (EMG) and mental relaxation (finger-tip temperature), and further, pointed out methods for measurement.

INTERVENING VARIABLES

Certain specific variables have been cited in the literature as factors affecting a person's perception of pain and the control of these variables dictated design considerations.

Melzack (1973) proposed that the cognitive activities which take place as a result of suggestion can influence pain by acting at the level of sensory transmission. This indicated the need to provide suggestions to all groups to eliminate the possibility that relaxation was achieved as a result of suggestion alone.

Cultural values and age are also known to play an important role in the way a person perceives pain, and therefore consideration needed to be given to culture in subject selection through sampling or other means of control (Melzack, 1973; Zboroski, 1952).

The variable age was a critical one because perceived risk may increase a woman's anxiety, tension, or fear and thus her pain (Fagerhaugh and Strauss, 1977; McCaffery, 1972).

McCaffery (1972) lists the following factors as being variables known to affect pain perception and level of anxiety in a patient:

emotionally traumatic life experiences, personal past experiences with pain, knowledge and understanding, and cognitive level, suggesting the need to control these variables through subject selection or measurement of differences.

The word, "control", arose frequently in the literature on pain (McCaffery, 1972; Melzack, 1973; Fagerhaugh and Strauss, 1977). The biofeedback literature also spoke to control as a potential variable affecting the ability to control one's body and use a strategy (Oliver, 1972; DeGood, 1975; Gatchel, 1975; Johnson and Meyer, 1974). The pain theorists saw a sense of control as reducing pain perception (McCaffery, 1972). The biofeedback researchers used locus of control tests to measure this variable and equate it to the ability to use a strategy. The results were mixed. Gatchel (1975), Raymond (1972), and Oliver (1972) found no significant effect between locus of control and ability to control body processes. DeGood (1975) found no significant effect between locus of control and response to stress. Johnson and Meyer (1974) found that internals seek more information and adopt behaviors that facilitate control.

The Rotter I-E Scale was used in all the above mentioned research and was selected for this research. The relationship between locus of control and ability to use a strategy could then be examined.

SUMMARY

A review of the literature in relation to intervening variables influenced the decision to establish criteria that would select a unicultural population, of similar age and past history in an attempt to measure three strategies identified from the literature as having a potential to reduce tension. These strategies were theoretically explained by the gate-control theory of pain. Selection of the dependent variables and their measurement was guided by a review of the literature. Potentially intervening variables were identified from the literature.

Chapter 3

RESEARCH DESIGN AND METHODOLOGY

SAMPLE

A sample was selected to study the relationship of amount of relaxation to coping strategies. The literature suggested that an appropriate sample would be pregnant women without a history of prenatal and/or birth complications (Fagerhaugh and Strauss, 1977). The age range (18-38 years) was chosen for sample selection due to the decreased risk of prenatal and birth complications in those years (Fagerhaugh and Strauss, 1977). The intervening variable, culture, was controlled by sampling from the predominate subculture of the area (Caucasian, English-speaking, college students). To control for the intervening variables identified by the literature (level of anxiety, emotionally traumatic life experiences, personal past experiences with pain, knowledge and understanding, and cognitive level) the subjects were screened through use of a questionnaire (Appendix C).

Criteria for Sample Selection

The following specific criteria were selected to control for the intervening variables identified by the literature:

- 1) Being in the third trimester of pregnancy
- 2) Being between the ages of 18 and 38 years
- 3) Being a primipara

- 4) Having no history of miscarriage.
- 5) Having no negative physical report, i.e., "high risk" pregnancy, or "trouble" reports.
- 6) Having no self report of a previous traumatically painful experience.
- 7) Being enrolled in one type of prenatal instruction class only.
- 8) Using English as a primary language.
- 9) Having completed high school.
- 10) Being Caucasian.

Sample selection was made from two populations. The first group or CS1, (n=3) was a random sample of volunteers from Lamaze Childbirth Education Classes. The second two groups: CS2 (n=3) and CS3, (n=3) were composed of women selected at random from a list of volunteers who had or were taking Prenatal Education Classes. These volunteers were then assigned randomly to either CS2 or CS3. The researcher used natural occurrence in grouping. Therefore, the assignment of the subjects could be controlled in two of the three groups. The first two groups, CS1 and CS2, were the experimental groups composed of women who had previously learned one of two strategies, biofeedback or Lamaze. The third group, or CS3, was the control group, and was composed of women who had no previous instruction in a relaxation strategy.

All three groups had received basic childbirth education. This required education, as well as the criteria for inclusion, was designed to control for the extraneous variable, history (Campbell and Stanley, 1963). A sample criterion screened out women who had previously had children or a "traumatically" painful experience. This screening out of negative past pain was essential to insure a homogeneous group (Melzack, 1970). An acceptable statistical test for this design was simple analysis of variance utilizing difference scores (Ferguson, 1977).

DESIGN

The design chosen to test the hypothesis corresponds with: the quasi-experimental; separate sample; pre-test, post-test, designed by Campbell and Stanley (1963). It represents a 2 x 3 matrix with repeated measures.

MEASUREMENT

The methods used to measure the dependent variables were as follows:

- 1) Muscle-Relaxation: An Autogen 1700 Electromyogram was used to measure the activity of the skeletal muscles. This activity is triggered by a complex pattern of electrical impulses originating in the central nervous system. Muscular relaxation occurs when the electrical discharge rate of the motor nerve decreases. Muscle relaxation was displayed as a decreased microvolt level on the Autogen 5600 Data Acquisition Center.

2) Mental-Relaxation: An Autogen 2000b Temperature Feedback Thermometer was used to measure the skin temperature of the hand, an indicator which is closely related to the activity of the autonomic nervous system (French, Leeb, and Boernes, 1973). Psychic-relaxation was displayed as in increased finger-tip temperature on the Autogen 5600 Data Acquisition Center.

3) Locus of Control: The Rotter I-E Scale was used to measure the subject's locus of control. This was a forced choice 29 item scale including 6 filler items. Item analysis and factor analysis show reasonably high consistency for an additive scale (Rotter, 1972). Discriminant validity is indicated by the low relationship with such variables as intelligence, social desirability, and political liberalism. The most significant evidence, of the construct validity, of the I-E Scale comes from the predicted differences in behavior for individuals above and below the median scale and from correlations with behavioral criteria (Phares and Chance, 1972). Scoring of the scale consisted of marking the external responses.

EXPERIMENTAL PROCEDURE

Setting

The setting for the study was the Montana State University Department of Psychology, Biofeedback Laboratory, Bozeman, Montana.

Volunteers were solicited by flyers and contact through existing classes. They were screened by interview according to the criteria on the questionnaire (Appendix B).

Procedure

An informed consent was obtained from the subjects selected for participation. The subject's confidentiality was protected by a number coding system for all data. The subjects were scheduled for three individual appointments. Those participating in Lamaze instruction were scheduled for appointments upon completion of the fourth week of class. Those selected for biofeedback were scheduled for appointments upon completion of the biofeedback training sessions (Appendix F). The subjects selected for the control, or Telling, group were scheduled for appointments upon completion of the fourth week of Prenatal Classes.

Experimental Sessions

During each session the subject was seated in a recliner in a darkened room. Apparatus was attached as in biofeedback training (Appendix F). The tone wasn't used in any group. Subjects were instructed that "the first 5 minutes are for you to get used to the equipment. You are to just sit quietly." Baseline EMG and temperature readings were taken at 30 second intervals in the form of interval means. The experimenter then entered the room and the subjects were instructed to relax as follows:

Lamaze (CS1)- "As you have learned, relaxation reduces pain in labor. So for the next 25 minutes you are to relax as you have learned in your Lamaze class."

Biofeedback (CS2)- "As you have learned, relaxation reduces pain in labor. So for the next 25 minutes you are to relax as you have learned in your biofeedback training."

Telling (CS3)- "As you have learned, relaxation reduces pain in labor. So for the next 25 minutes you are to relax as you were told in class."

During the relaxation times, EMG and temperature readings were taken at 30 second intervals in the form of interval means. At the end of the relaxation session the experimenter re-entered the room and told the subjects to "just sit quietly for the next 5 minutes." Post-treatment readings were taken in the same manner as the other readings.

At the end of the third session the subjects were thanked for their participation and their questions were answered.

Chapter 4

ANALYSIS OF THE DATA

The analysis chapter is divided into two sections. The first section is a description of the sample tested. The second section contains the results of the statistical analysis, used to test the four null hypotheses in Chapter 1 and to address the objectives which were:

- 1) To describe the relationship between the amount of relaxation and the strategies of Lamaze, Biofeedback, and instruction or telling.

- 2) To describe the relationship of relaxation readings of women volunteers to their locus of control scores as measured by the Rotter I-E Scale.

NATURE OF THE SAMPLE

Subjects were accepted for testing on the basis of being primiparas between the ages of 18 and 38 years, having no previous history of miscarriage or abortion, and no subjective report of "traumatic pain". All subjects were married and had graduated from high school. The criterion questioning was done before administering any further testing. Twelve women volunteered for testing and nine were accepted following criterion questioning.

Characteristics of the Three Groups

The characteristics of the three groups (CS1, CS2, CS3) are presented in Table 1. The data in this table show the sample displayed homogeneity within and between the groups in relation to age and length

of gestation. The mean age for the nine subjects (24.6 years) is higher than the national average (21.7) for primiparas. This finding is most likely due to the volunteers being solicited from a community of college students. Lamaze classes in this community have an older primipara according to the instructor's observation. The range of the length of gestation was 25-31 weeks. Inspection of the data showed the three groups deviated little from each other on the variable, length of gestation:

Table 1. Demographic Characteristics (Age and Length of Gestation) of the Sample.

		Group			
		CS1 (n=3) Biofeedback	CS2 (n=3) Lamaze	CS3 (n=3) Telling	Total
Age (Years)	Range	22-29	22-27	23-28	22-29
	Mean	24.6	24	25	24.56
	S.D.	3.0919	2.1602	2.1602	2.5435
Gestation (Weeks)	Range	26-30	27-31	25-30	25-31
	Mean	28.3	27.6	27.3	27.78
	S.D.	1.8859	1.6653	2.0551	1.9309

To test the null hypothesis of no difference in EMG readings among subjects using coping strategies of Lamaze or Biofeedback as compared to those using the coping strategy, telling, a simple analysis of variance (Roscoe, 1969) was applied to data and is reported in Table 2.

The simple analysis of variance is used for testing the hypothesis that two or more independent samples were drawn from populations having the same mean (Roscoe, 1969). The samples may be constituted by drawing independent random samples from a single population, subjecting them to experimentation and then comparing them on a single criterion variable. The samples in this study were obtained through screening volunteers to obtain a population similar in age, para, history, and length of gestation. A naturally occurring group was selected in the case of Lamaze. Assignment to the Biofeedback or the Telling group was done randomly. External validity was affected and is addressed in Chapter 5.

The summary data for the analysis of variance are presented in Table 2. A one-way analysis of variance was run with 3 groups (Lamaze, Biofeedback and Telling) and 9 subjects. The degrees of freedom associated with the design are 2($df = 3-1=2$) and 6($df = 9-3=6$).

Table 2. Summary Data for the Analysis of Variance of EMG Readings

Source of Variation	df	Sum of Squares	Mean Squares
Between groups	2	.8718	.4359
Within groups	6	.4824	.0804
Total	8	1.3542	---
$P \leq .05$		$(F = 5.42)$	

In evaluating the results of the experiment to determine whether F value for treatment effects was significant the .05 percent level of significance was applied.

The F ratio required for significance with 2 and 6 degrees of freedom was 5.14 at the .05 level. The F value for the data was 5.42 which is above the .05 level. The null hypothesis is therefore rejected.

When using the analysis of variance with more than two groups there is a question of the source of the significant difference. Multiple comparisons with simple analysis of variance is a controversial subject among statisticians and one for which there is at present no completely satisfactory solution (Roscoe, 1969; Ferguson, 1976). The research hypothesis tested the question of whether 2 groups (Lamaze and Biofeedback) which learned specific strategies have lower EMG scores than a group (Telling) that did not learn a strategy. The F value for main effect along with the appreciably larger means of the Lamaze (.80) and Biofeedback (.78) groups as compared to the mean of the group Telling (.16) indicated that no further test of significance was necessary.

The second null hypothesis: There will be no difference in fingertip temperature readings among subjects who use coping strategies of Lamaze or Biofeedback as compared to those who use the strategy of Telling was tested with the simple analysis of variance. The summary data for the simple analysis of variance for fingertip temperature are presented in Table 3.

Table 3. Summary Data for the Analysis of Variance of Finger-Tip Temperature Readings

Source of Variation	df	Sum of Squares	Mean Squares
Between groups	2	1.1862	.5931
Within groups	6	.8016	.1336
Total	8	1.9878	---
P \leq .05		(F = 4.44)	

The F ratio required for significance with 2 and 6 degrees of freedom was 5.14 at the .05 percent level. The F value for these data was 4.44 which is below the .05 level. The null hypothesis is therefore accepted.

To test the third null hypothesis stating there is no relationship between EMG scores and scores on the Rotter I-E Scale the Pearson product moment test of correlation was performed on the data in Table 2 (see page 31). The r for the data is .1991. When two variables are said to be not correlated the coefficient is zero, a perfect correlation is equal to plus or minus one. The sign of the r indicates the direction of the correlation (Roscoe, 1969). An r of .1991 shows little or no correlation. "Possibly the most valid and useful interpretation of the correlation coefficient is achieved by squaring it" (Roscoe, 1969, p. 191). The proportion of the variance or the variance of one measure (EMG) which is accounted for by the other (I-E Scale Score) is equal to r^2 . Thus, $r^2 = .0396$ or four percent of the variation in EMG is accounted for or attributable to the person's locus of control. The squared r of

four percent is also indicative of little or no correlation. The null hypothesis is accepted in this case.

The Pearson r was also used to test the fourth null hypothesis of no correlation between EMG readings and finger-tip temperature readings. The $r = -.1968$, and $r^2 = .0387$. The negative sign indicated a negative correlation or direction, but only 4 percent of the variation in EMG can be accounted for by the variation in temperature. The null hypothesis was accepted for this hypothesis.

In summary, the nine subjects represent a sample of married, primiparas with no history of miscarriage and/or abortion, and no subjective report of "traumatic pain". The mean age, and gestational age deviate little among the groups. The three groups show a high degree of similarity on the variables known to affect perception of pain in general and perception of pain in childbirth in particular.

The research findings support the acceptance of the following hypothesis:

- 1) There were significantly lower EMG readings among subjects who used the coping strategies of Lamaze or Biofeedback as compared to those who used the coping strategy, Telling.

- 2) There was no significant difference in finger-tip temperature readings among subjects who used coping strategies Lamaze or Biofeedback, as compared to those who used the strategy, Telling.

- 3) There was no correlation between locus of control and EMG scores.

- 4) There was no correlation between EMG scores and finger-tip scores.

Chapter 5

CONCLUSIONS, DISCUSSION, RECOMMENDATIONS, AND IMPLICATIONS

CONCLUSIONS

Four hypotheses were tested in this research. The results of applying a simple analysis of variance to the data collected on the dependent variables EMG and finger-tip temperature lead to the following conclusions in testing the first two hypotheses:

1) There were significantly lower EMG readings among subjects who used coping strategies of Lamaze or Biofeedback as compared to those who used the strategy Telling.

2) There was no significant difference in finger-tip temperature readings among subjects who used coping strategies of Lamaze or Biofeedback as compared to those who used the strategy Telling.

The third hypothesis was tested by applying the Pearson product moment correlation coefficient to the data collected on the variable, locus of control, which led to the following conclusion: There was no significant relationship between a subject's EMG reading and their score on the Rotter I-E Scale. The amount of variance in EMG readings which can be related to the subject's locus of control was four percent.

The fourth hypothesis was tested by application of the Pearson product moment correlation coefficient to the EMG and temperature readings to describe their relationship. The following conclusion was

reached: There was no correlation between EMG and finger-tip temperature readings.

DISCUSSION AND RECOMMENDATIONS

The comparison of the relaxation scores (muscle-EMG, mental-finger-tip temperature) obtained by two groups of subjects trained to use a strategy to relax (Biofeedback, Lamaze) as compared to a group told to relax (Telling) resulted in significantly lower EMG scores (muscle relaxation) and no significant differences in finger-tip temperature (mental relaxation).

The methodology for obtaining EMG and finger-tip temperature readings consisted of measuring a baseline on each individual prior to measuring their "relaxation". This provided the investigator with the change in relaxation scores that the subject gained as compared with their baseline, rather than the subject's individual state of relaxation. This was done to control for the intrinsic variable of the relaxed person. This along with other methodological and design criteria lends credibility to the conclusion that the results are indeed dependent on the treatment strategies (Lamaze and Biofeedback).

The data obtained on EMG were consistent with the literature. It was expected that the use of either Lamaze or Biofeedback would result in decreased muscle tension or lower EMG scores. It was observed by the investigator, while collecting thirty-second EMG readings over the treatment sessions that the Biofeedback group maintained low scores

during the treatment sessions. Although the Lamaze group's scores would drop, they tended to fluctuate during the treatment session. Because of these observations, further research could include a graph print-out of EMG, obtained during the relaxation periods and curve-fitting could be done to the data. This would look at the qualitative aspect of the relaxation obtained as well as the quantitative dimension. For example, perhaps there were two types of "relaxation" taking place--one in the Lamaze and another in the Biofeedback groups.

A further recommendation would be to measure EMG readings at other sites to determine if the relaxation achieved was total-body relaxation. The literature on EMG as a total-body relaxation method is inconclusive and this research would shed light on that question (Coursney, 1975; Alexander, 1975; Haynes, et. al., 1975; Cox, et. al., 1975).

The results of the measurement are consistent with the literature on finger-tip temperature as a measurement of autonomic nervous system relaxation, in that the literature was inconclusive. Theoretically, finger-tip temperature should be a measure and be negatively correlated with EMG. Analysis of the data resulted in a negative sign on the coefficient as the literature suggested. But the correlation was too weak (four percent) to be conclusive. Part of the problem may be in the measurement technique. It was observed by the investigator that the subjects' thermistor probes often were loose or about to fall off at the end of a session. This led the researcher to question the validity of the readings. Also, if the muscle relaxation is of a site rather

than the total body, then site may be warmer rather than the finger-tip. It would be a recommendation of the investigator that readings be taken at various sites on the body, some correlated with electrode placement. This would enable the researcher to determine whether or not low EMG scores correlated with high finger-tip temperature or high skin temperature at the site of electrode placement.

It is a further recommendation that a subjective measure of perceived relaxation be taken from subjects following treatment sessions. The information would shed some light on the question of whether the Biofeedback and the Lamaze strategies produce relaxation only when being performed, or whether they produce a state of relaxation which lasts past the time of actual performance.

The data obtained on the correlation of locus of control (as measured by Rotter I-E Scale) and EMG is also consistent with the work of DeGood (1975), Raymond (1972), Fox (1972), and Gatchel (1975). DeGood (1975) studied the interaction of locus of control, and the use of a coping behavior or strategy. He found no significant relationship between scores on the Rotter I-E Scale and the ability to control through avoidance. He stated:

The extension of a model of coping behavior to humans requires a consideration of relevant attitudes and expectancies. Given the wide range of individual learning experience among human subjects, it seems reasonable that effective coping strategies might involve an interplay between personality and situational phenomena.

It is a recommendation that a locus of control test that measures perceived control over one's body be used, rather than the Rotter I-E Scale which measures perceived social control.

In addition to discussion and recommendations on the dependent variables and their measures, the investigator would make three other recommendations.

The first relates to sample size ($n=9$). The recommendation for further study would be to increase the number to a minimum of 30 subjects. The ideal would be to increase the age range of the sample, and to randomly assign them to groups.

The second recommendation would be that the subjects be measured for amounts of relaxation during the first phase of labor with The McGill pain questionnaire (Melzack and Debusson, 1976; Melzack, 1975). This would facilitate measuring the effects of learning a strategy, performing it during labor, and the resultant ability of the strategy to affect pain perception.

The third recommendation would build on a replication of this study. As a body of data is compiled on the ability of Lamaze and Bio-feedback to reduce muscle tension and thus pain perception, measures should be made of other techniques said to "help relax" such as yoga, relaxation response, hypnotism and guided imagery. This would provide the link needed to move on to evaluating the ability of relaxation to reduce pain perception.

IMPLICATIONS

The research design tested the possibility that when a woman is instructed in a relaxation strategy she can relax more effectively than when just told to relax. The data supported this premise. Women who were instructed in Lamaze or Biofeedback did achieve more relaxation (as measured) than women who were simply told to relax.

The implications for clients are many and the need is great. The fear of pain is said to rank second only to the fear of death (Zborowski, 1969). Pain is the most frequent and compelling reason why a person seeks health assistance (Zborowski, 1969). The fact that a strategy enabling a person to relax can be taught, and that relaxation decreases pain provides a conceptual umbrella for alternative non-invasive pain relief measures. Pain is a dynamic threat and a coping strategy must lend itself to the complexity of treating pain. Relaxation strategies can be applied to all the phases of pain, anticipation, presence, and aftermath. Patients about to undergo pain producing treatments can be aided during their recovery phase by previous instruction on self-induced relaxation and how to use it to relieve pain. Their anxiety can also be reduced in the anticipation phase through the use of a specific strategy such as imagery, and group patient education classes aimed at providing realistic expectations. Both, realistic expectations and group support are known to decrease anxiety or tension, thus reducing pain (Melzack, 1973).

Patients who have chronic pain can also benefit from relaxation as a pain relief measure. Cancer victims can supplement their analgesias or utilize relaxation as a pain reliever while awaiting their next pain medication. During debridement (presence) a burn patient can utilize relaxation (specifically distraction) to reduce the pain of the treatment and/or supplement a pain medication.

Several, as of yet untested, questions arise from the idea of using relaxation as a pain reliever. First, in some cases, burns for example, healing may be speeded up by the relaxation due to the concomitant vasodilation. Second, in cases of chronic severe intermittant pain, hypertension exists along with the personal tension from the anticipation of the next painful episode. It can be speculated that these clients would also benefit from learning a strategy and presence phase. It can be further speculated that the hypertension would decrease.

The list could go on as to the usefulness of relaxation in the phases of pain, as well as all stages of illness. But another feature of this dynamic therapy, relaxation, is the way it lends itself to the profession of nursing.

The implications for nursing are also many. Inherent in the nurse-client encounter is a relationship built of trust, time and aimed at individualized care. The nurse who teaches relaxation therapy to her client provides the client with a flexible therapy because it would allow the client to utilize it when he/she needs it (McCaffery, 1972).

This nurse-client relationship with its quality of trust provides a therapeutic context for optimum pain relief (Melzack, 1973). The teaching function of the professional nurse also helps to reinforce the idea of the nurse as a qualified provider in the use of relaxation strategies with clients.

This teaching function is not only a professional one, but also a personal one. If the teaching of strategies to provide relaxation is to reach the client, nurses at all levels must, first, become knowledgeable in the strategies available for pain relief. Second, the nurses must become responsible for educating their clients, whether students, peers, or patients, about the use of relaxation strategies to reduce pain. Third, further research into the various relaxation strategies (yoga, T.M., distraction, massage) is needed to elaborate on how they work, how they are learned, and how they are retained. The vast number of clients needing pain relief, as well as the nursing profession, can benefit from these steps to become knowledgeable about such a promising treatment mode.

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APPENDIX A

LIST OF TEXTS REVIEWED

The following text books were reviewed for the utilization of relaxation strategies as a pain relief measure. Strategies for relaxation were not mentioned in any of them. The gate-control theory was not utilized except in listings with an asterisk.

Advanced Concepts in Clinical Nursing. Ed. Kay Corman Kintzel.
Philadelphia: J.B. Lippincott, 1971.

A Text Book of Medical-Surgical Nursing. Barbata, Jean C. New
York: Putman, 1964.

Clinical Nursing: Pathophysiological and Psychological Approaches.
Irene L. Beland. New York: Macmillan, 1970.

*The Clinical Practice of Medical-Surgical Nursing. Marjorie Beyers,
Susan Dadas, Boston: Little and Brown, 1977.

Textbook of Medical-Surgical Nursing. Lillian Sholtis Burnner.
Philadelphia: J.B. Lippincott, 1970.

Promotion of Physical Comfort and Safety. V.G. Fischer and A.F. Con-
olly. Dubuque: W.C. Brown Company, 1970.

Fundamentals of Nursing: the humanistics and the sciences in nursing.
E.V. Fuerst, L. Wolff, and MH. Weitzel. Philadelphia: J.B.
Lippincott, 1974.

*Medical-Surgical Nursing: A Conceptual Approach. Ed D.A. Jones.
New York: McGraw-Hill, 1978.

Concepts Basic to Nursing. P. Mitchell. New York: McGraw-Hill, 1978.

Nursing Concepts of Practice. D. Orem. New York: McGraw-Hill, 1971.

Care of the Adult Patient: Medical-Surgical Nursing. D.W. Smith.
Philadelphia: J.B. Lippincott, 1971.

Comprehensive Pediatric Nursing. G. Scipien, M.U. Barnard, M. Chard,
J. Huve, P. Phillips. New York: McGraw-Hill, 1975.

Behavioral Concepts and Nursing Interventions. C. Carlson, B. Blackwell.
Philadelphia: J.B. Lippincott, 1978.

Nursing: Levels of Health Intervention. A. Burgess. New Jersey:
Prentice-Hall, 1978.

APPENDIX B

PATIENT CONSENT FORM

I am willing to participate in this research project concerned with relaxation and pain perception. Ms. Margo Caldwell, a nurse and a graduate student has explained the procedures for the relaxation sessions, including the use of the instruments that monitor muscular relaxation and temperature. It is my understanding that by participating in this study, I will meet with Ms. Caldwell for thirty minute relaxation sessions, have a history taken, and take a standardized psychological test. I am clearly aware that there will be no financial charge and my confidentiality will be maintained. Although I have signed this consent form, I may withdraw from this study at any time without adversely affecting any other aspect of my prenatal classes.

Signed: _____

Witness: _____

Date: _____

APPENDIX C

INTERVIEW QUESTIONNAIRE

ID: _____

PARA: _____

AGE: _____

MARITAL STATUS: _____

EDC: _____

GRADE COMPLETED IN SCHOOL: _____

LANGUAGE: _____

RACE: _____

TYPE OF CHILDBIRTH EDUCATION: _____

HISTORY

Have you ever had a spontaneous abortion or miscarriage? _____

Has your doctor ever told you that you are at risk or a high risk? _____

Do you have any fears that this pregnancy or labor will be exceptionally difficult?

Have you ever experienced what you would consider an extremely painful experience?

COMMENTS:

APPENDIX D

INSTRUCTIONS FOR THE I-E SCALE

This is a questionnaire to find out the way in which certain important events in our society affect different people. Each item consists of a pair of alternatives lettered a or b. Please select the one statement of each pair (and only one) which you more strongly believe to be the case as far as you're concerned. Be sure to select the one you actually believe to be more true rather than the one you think you should choose or the one you would like to be true. This is a measure of personal belief: obviously there are no right or wrong answers.

Please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. Find the number of the item on the answer sheet and black-in the space under the number 1 or 2 which you choose as the statement more true.

In some instances you may discover that you believe both statements or neither one. In such cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

APPENDIX E

I-E SCALE

1. a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.
2. a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.
3. a. One of the major reasons why we have wars is because people don't take enough interest in politics.
b. There will always be wars, no matter how hard people try to prevent them.
4. a. In the long run people get the respect they deserve in this world.
b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.
5. a. The idea that teachers are unfair to students is nonsense.
b. Most students don't realize the extent to which their grades are influenced by accidental happenings.
6. a. Without the right breaks one cannot be an effective leader.
b. Capable people who fail to become leaders have not taken advantage of their opportunities.

7. a. No matter how hard you try some people just don't like you.
b. People who can't get others to like them don't understand how to get along with others.
8. a. Heredity plays the major role in determining one's personality.
b. It is one's experiences in life which determine what they're like.
9. a. I have often found that what was going to happen will happen.
b. Trusting fate has never turned out as well for me as making a decision to taking a definite course of action.
10. a. In the case of the well prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is really useless.
11. a. Becoming a success is matter of hard work, luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
12. a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
13. a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.

