



1984

Parental Presence and Pain Perception in the School-Age Child

Sandra Baran Englert
Loyola University Chicago

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PARENTAL PRESENCE AND PAIN PERCEPTION
IN THE SCHOOL-AGE CHILD

by

Sandra Baran Englert

A Thesis Submitted to the Faculty of the Graduate School
of Loyola University of Chicago in Partial Fulfillment

of the Requirements for the Degree of

Master of Science in Nursing

December

1984

ACKNOWLEDGMENTS

The author is very grateful for the invaluable advisement and support provided by the thesis Director, Dr. Linda Janušek, and thesis committee members Dr. Elizabeth Brophy and Dr. Dona Snyder. Their flexibility and cooperation with the author's in absentia research efforts were especially appreciated.

The assistance of Dr. Janice Nelson, Director of Nursing at State University Hospital, was sincerely appreciated. In aiding the author to obtain permission for data collection at her facility, she truly exhibited a commitment to nursing research.

The author also thanks the nursing and medical staff of the pediatric inpatient unit at State University Hospital for their cooperation and assistance during the data collection process.

Finally, the author wishes to acknowledge the support and assistance provided by her husband and parents during the duration of her thesis work and throughout her graduate studies.

VITA

The author, Sandra Baran Englert, is the daughter of Richard Francis Baran and Lorraine (Gburek) Baran. She was born June 26, 1958, in Buffalo, New York.

Her elementary education was obtained in the school system of the Catholic Diocese of Buffalo, and her secondary education at St. Mary's Diocesan High School, Lancaster, New York, where she graduated as class salutatorian in June, 1976.

In September, 1976, she entered Niagara University. While attending Niagara University, she was elected into Sigma Theta Tau, the National Honor Society for Nursing, and Delta Epsilon Sigma, the National Honor Society of Catholic Colleges and Universities. She graduated *summa cum laude* in May, 1980, receiving the degree of Bachelor of Science in Nursing.

In January of 1981, she entered the graduate program of the Marcella Niehoff School of Nursing at Loyola University of Chicago.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS	ii
VITA	iii
LIST OF TABLES	vi
CONTENTS OF APPENDICES	vii
INTRODUCTION AND STATEMENT OF THE PROBLEM	1
REVIEW OF THE LITERATURE	4
Physiological Components of the Pain Experience	4
Non-physiological Factors Affecting the Pain Experience	8
Pain in Children	10
Pediatric Pain Assessment Instruments	16
Developmental Characteristics of the School-age Child	21
Effects of Parental Presence on Children in Pain and Stressful Situations	28
Summary	35
DEFINITION OF TERMS	38
HYPOTHESES	40
ASSUMPTIONS	41
RESEARCH DESIGN	42
Overview	42
Setting	42
Sample	42
Data Collection Instruments	43
Collection of Data	47
RESULTS	50
Description of the Sample	50
Responses	50
Analysis of Data	55

DISCUSSION	60
Interpretation of Findings	60
Limitations	64
Significance	67
Recommendations for Additional Research	70
REFERENCES	73
APPENDIX A	78
APPENDIX B	81
APPENDIX C	83
APPENDIX D	86
APPENDIX E	88

LIST OF TABLES

Table	Page
1. Descriptive Data for Individual Subjects	51
2. Specific Surgical Procedures	52
3. Individual Subject Responses	54
4. Statistical Testing of Hypothesis I	57
5. Statistical Testing of Hypothesis II	58

CONTENTS OF APPENDICES

	Page
APPENDIX A Body Outline for the Eland Color Tool	78
APPENDIX B 10-Centimeter Scale	81
APPENDIX C Parental Informed Consent Form	83
APPENDIX D Subject Assent Form	86
APPENDIX E Participant Data Form	88

INTRODUCTION AND STATEMENT OF THE PROBLEM

Keeping patients comfortable and free of pain is an important goal for any nurse. To the pediatric nurse, achieving this goal often presents a substantial challenge. Although recent medical and nursing research has led to the development of theories explaining the physiologic components of pain, as well as the development of numerous strategies for use in relieving pain, little research has been conducted in the area of pain management in children. Since the school-age child's developmental needs, cognitive capabilities, and perceptions of pain and related phenomena, such as illness and hospitalization, are distinctly different from those of adults, the development of specific strategies to deal with pain in children is necessary.

An important factor to be considered in many clinical situations involving the school-age child in pain is whether or not the child's parents are present. Mc Caffery (1979, pp. 74-75) states that the patient's family may either contribute to the relief of a patient's pain, avoid causing increased pain, or have a detrimental effect on the pain experience. She is of the opinion that it is the responsibility of the nurse to identify the potential for family members to either increase or decrease the patient's pain, and then interact with them accordingly. She notes the importance of support and preparation of parents, stating that if a parent's anxiety level is high, he may neglect to prepare the child for hospitalization, and the child's

subsequent anxiety may increase his pain.

Results of previous research investigating the effects of parental presence on children in stressful situations have been varied. Studies involving hospitalized children conducted by Prugh, Staub, Sands, Kirschbaum, and Lenihan (1953), Brain and Maclay (1968), May (1972), and Dew, Bushong, and Crumrine (1977) associated parental presence with positive effects. In an investigation by Jessner, Blom, and Waldfogel (1952), maternal rooming-in was associated with a decrease in the hospitalized child's anxiety level in some respects, but an increase in other types of anxiety. Findings of Lehman (1975) associated parental presence with detrimental effects. Hamovitch (1964) found increased parental participation in the care of terminally ill children helpful in the majority of cases, but ineffective and even detrimental in others.

Frankl, Shiere, and Fogels (1962), in a study involving children undergoing dental procedures, found parental presence to have no significant benefit, but no detrimental effects. Results of a study by Schulman, Foley, Vernon, and Allen (1967) involving pediatric patients undergoing anesthesia induction were similar. Another study in pediatric dentistry by Venham, Bengston, and Cipes (1978) indicated that children were more relaxed during dental procedures when a parent was present.

Shaw and Routh (1982) associated maternal presence with increased negative behavior in children receiving intramuscular injections. Finally, Eland (1983a) reported an inverse relationship between

the amount of time a parent was present and the frequency with which hospitalized children received analgesics.

Only the last two studies concentrated specifically on children experiencing pain. The majority of the studies involved pre-school children as subjects. Many of the studies were simply descriptive in nature, and data was not gathered through the use of reliable and valid pain assessment tools. Since no previous research has been specifically directed at relating parental presence and the pain experience in school-age children, this study focused on the following question: Is there a difference in the school-age child's perception of pain when a parent is present, as compared to when a parent is not present?

REVIEW OF THE LITERATURE

The general concept of pain, and how it specifically relates to the pediatric patient, as well as the school-age child's psychosocial and cognitive developmental levels and how they influence his fears and perceptions of health, illness, and pain are important concepts to consider as a basis for this study. In this section a summary of information related to these concepts will be presented, along with a synopsis of research findings related to the relationship between parental presence and stressful situations in children.

Physiological Components of the Pain Experience

In 1971 Melzack and Torgerson conducted a study aimed at the identification and categorization of words used to describe pain by adult subjects. Based on their results, they concluded that pain is a multidimensional experience, encompassing sensory, affective, and evaluative components. Wolf (1980) similarly sees pain as a complex phenomenon having sensory dimensions of time, space and intensity, emotional dimensions, cognitive dimensions, and motivational dimensions.

Basic to the understanding of the complex concept of pain is an understanding of the physiological mechanisms by which the sensations of pain are experienced. Though much of the mechanism by which pain sensation occurs is understood, certain specific aspects of the process are explained only in theory.

Those known aspects of pain sensation are explained by Guyton

(1981). Receptors exist in the body's tissues which are sensitive to mechanical stress or damage to the tissues, extremes of temperature, or specific chemical substances, such as bradykinin, histamine, potassium ions, prostaglandins, and proteolytic enzymes, which are released by damaged tissues. Sensations are transmitted from these receptors to the central nervous system via two types of pain fibers. Small Delta type A, or "fast" pain fibers result in sharp, pricking pain sensations, while unmyelinated type C, or "slow" pain fibers result in burning pain (pp. 612-614).

Pain fibers enter the spinal cord at the dorsal roots, ascend or descend one or two segments in the Tract of Lissauer, and terminate on neurons in the dorsal horns of the gray matter. It is believed that pain sensations pass through one or more short fibered neurons which lead to long fibers that cross the opposite side of the cord in the anterior commissure and travel upward to the brain via the anterolateral spinothalamic pathway (p. 614).

In the brain, pain sensations travel via two separate pathways. The "pricking pain pathway" terminates in the ventrobasal complex of the thalamus. Signals are then transmitted to other areas of the thalamus and to the somatic sensory cortex. It is believed that the signals to the cortex are probably important for localizing rather than interpreting pain (p. 614).

The "burning pain pathway" terminates in the reticular area of the brainstem and the intralaminar nuclei of the thalamus. Both these termination points are contained within the reticular activating

system, which transmits signals into all parts of the brain, activating the entire nervous system and promoting defensive and aversive reactions. Pain signals transmitted by this pathway can be localized only grossly, and may be of a summative nature (pp. 614-615).

Individuals are able to perceive pain even after complete removal of the somatic sensory areas of the cerebral cortex. It is thus believed that some conscious pain perception is elicited when pain impulses enter the thalamus and lower centers, and that the cortex plays an important role in interpreting the quality of pain (p. 615).

Guyton points out that the threshold for pain perception, which is determined by the sensitivity of pain receptors, is approximately equal in all individuals, but reactions to pain vary greatly among individuals. These reactions are of two types. Reflex motor reactions are primitive spinal cord reflexes and reflexes from the brain which remove the body or the affected body part from the pain-causing noxious stimulus. Psychic reactions are more subtle, and vary more among individuals. They include anguish, anxiety, crying, depression, nausea, and muscular excitability (p. 615).

As opposed to other sensory receptors, pain receptors, according to Guyton (p. 613), possess minimal adaptation properties. The threshold for the excitation of pain fibers may even become progressively lower as the pain stimulus continues. Non-adaptation serves the protective function of allowing the individual to remain aware of a potentially damaging stimulus as long as it exists.

Pain inhibiting systems may change the intensity of pain signals

transmitted up the spinal cord. The "analgesic" system in the brain and spinal cord involves electrical stimulation which suppresses pain transmissions but has no effect on other sensations. Enkephalins are found in certain areas of the brain and endorphins are found in the hypothalamus and pituitary gland. Both are believed to activate portions of the brain's analgesic system to initiate a morphine-like effect. Finally, transmission of pain signals from a specific area of the body may be inhibited by stimulating the large sensory fibers of peripheral tactile receptors in the same area (pp. 615-616).

In an attempt to further explain mechanisms of pain transmission and inhibition, Melzack and Wall proposed the Gate Control Theory in 1965, and described their revised theory in 1977. Pain perception is suggested to be determined by interactions among three systems. T-cells (transmitter cells) activate nerve mechanisms that are responsible for perception and response. The substantia gelatinosa comprises the "gate control mechanism," modifying and regulating afferent patterns before they reach the T-cells. The afferent patterns in the dorsal column provide the "central control trigger," activating specific processes in the brain, and, via descending fibers, influencing the modulating properties of the gate control system.

The signal triggering pain perception and response occurs when T-cell output reaches a critical level. Penetration of T-cells by afferent pain impulses is influenced by both afferent pain fiber activity and descending impulses caused by central control processes in the brain.

The frequency of nerve impulses leaving the T-cells, which, when the theory was revised by Melzack and Wall, were specifically identified to be cells of Lamina V in the dorsal horn near the substantia gelatinosa, must exceed a critical level for pain perception and reaction to occur. Excitation of and release of impulses from the Lamina V cells is influenced by mechanical stimulation. Light stimulation of cutaneous origin via large afferent fibers inhibits the release of impulses. This release is facilitated by heavy stimulation of cutaneous, muscular, or visceral origin via small fibers. Descending impulses from the brainstem exert their control over the Lamina V cells by exciting the inhibitory mechanism. These descending impulses are based on central activities, such as attention, emotion, and memories of past experiences.

Non-Physiological Factors Affecting the Pain Experience

If the Gate Control Theory is assumed to be valid, the pain experience may be influenced not only by physical factors, but by emotional and cognitive factors as well, via descending inhibitory cortical efferent pathways.

Based on his experience with soldiers severely wounded in battle, Beecher (1946) proposed that strong emotion may affect an individual's perception of pain. In surveying 215 wounded men as to what degree of pain they were experiencing, he found that three-fourths of the men complained of minimal pain, and denied the need for pain medication, even though they had not been recently medicated.

In 1956, Beecher conducted a similar survey with civilian patients who had undergone operative procedures, and found the complaints of pain and requests for medication to be greatly increased in number in the civilians, when compared with the soldiers surveyed earlier. He concluded that the pain experience may be modified by associated emotional factors. In the situation involving the soldiers, a severe wound served as a means of escape from a life-threatening situation on the battlefield. Anxiety, and consequently the perception of pain, was reduced.

Bobey and Davidson (1970) attempted to determine if listening to tapes having different emotional tones affected the ability to tolerate experimental pain in a group of nursing students. They found the greatest tolerance for pain to occur when a relaxing tape was played, less tolerance when a tape of an anxiety-producing situation as well as a tape preparing the subjects for the experience was played, and the lowest level of pain tolerance to be associated with a control tape involving no emotional factors. The researchers reached the conclusion that emotional factors do affect pain tolerance.

Jacox (1977) states that psychological, social, and cultural factors may affect the pain experience in six ways. Such factors may contribute to the illness or condition causing the pain, the response of the patient to the pain sensation, his tendency to report the pain, the assessment process, interventions chosen to alleviate pain, and the patient's response to treatment.

Pain in Children

Though a multitude of studies have been conducted examining various aspects of the pain experience in adult subjects, very little research has investigated problems involved with pediatric pain. Swafford and Allan (1968) point out that historically it was believed that complete myelination of nerve tracts was required for pain to be experienced, hence, infants and young children did not experience pain. They state that various researchers have refuted this belief, proving that some but not complete myelination is necessary, and though myelination is only partially completed at birth, it proceeds rapidly when nerve tracts are utilized during physiological function. Their description of the active, full-term infant's reaction to his first injection in the delivery room evidences the infant's capacity for pain sensation.

Pozanski (1976) agrees that infants do experience pain sensations, but states that there is no evidence as to whether or not performance of painful procedures without anesthesia in the infant, a common practice, has long-term psychologic consequences. He also describes how pain reactions evolve as the child matures. The neonate initially reacts to pain with crying and generalized body movement which quickly ceases with distraction. He begins to develop the ability to localize the painful area at between three and ten months of age, and this ability gradually becomes more specific.

Wachter-Shikora (1981) states that it is significant that the infant's response to pain involves crying as well as body movement.

Crying indicates an emotional, higher nervous system response, rather than simply a spinal level motor reflex.

A study was conducted by Haslam (1969) to determine if a relationship existed between age and pain threshold. In 115 children ages five to eighteen years, he found that the threshold for pain increased with age, and concluded that the younger child is more susceptible to pain.

Though it is generally accepted that children do experience pain, little attention is often given to pediatric pain by parents and health care professionals. In a discussion of recurrent pain in children, Apley (1976, p. 386) states that these complaints are simply reactions to emotional stress, and are frequently used "to manipulate and dominate their family and their environment." He indicates that in the majority of cases of such pain, no organic cause is discovered. Epstein and Harris (1978), staff physicians at the Johns Hopkins Pediatric Pain Treatment Center, have observed that as opposed to pain in adults, chronic pain in a child is often ignored by his family and physician until his behavior and school performance are affected to the extent that authorities become concerned.

Eland (1983a), a nurse researcher, attempted to identify differences in the use of pain relief measures by nurses caring for adult and pediatric patients. In a group of 25 patients between four and eight years of age, hospitalized with various medical or surgical conditions involving severe pain (i.e., nephrectomy, spinal fusion, 40% second degree burns, hypospadias repair), only 48% received some type

of pain medication, although pain medications were ordered for 84%, and 68% indicated by self-report that they were experiencing pain. The total number of doses administered was 24, with only 11 being narcotics. On the same hospital units, however, a total of 671 doses of pain medication, 372 of them narcotics, were administered to a group of 18 adult patients with diagnoses matching those of the pediatric patients.

Eland also is of the opinion that there is a traditional focus in pediatrics on discovering and treating the causes of pain, but not treating the pain itself. She cites as an example the child with otitis. When the child is brought to the pediatrician and diagnosed, an antibiotic is prescribed and the child is sent home. Parental anxiety is relieved due to the identification of the cause of the pain, but often no analgesic is prescribed for the child, and he remains in acute pain until 24 to 48 hours later, when the antibiotic begins to take effect.

It is the opinion of Abu-Saad (1981) that many pediatric nurses are not aware of the multiple variables involved in the pediatric pain experience. She identifies three factors specifically involved in the pediatric pain experience--developmental level, cognitive abilities, and parent-child interactions--and states that the child's pain experience should not be thought of as "a muted version of the adult's." Mc Bride (1977) states that pain in a child is "immeasurable" and dependent upon the perception and interpretation of the individual child.

Specific critical aspects of the pain experience in children are described by Eland (1981, 1983a). The child has a limited ability to understand and communicate the concept of pain, because it is a subjective response with no consistent objective consequence. She compares the concept to that of nausea. Nausea is often followed by the objective consequence of vomiting, enabling the child to understand the subjective concept of nausea more clearly. Also, pain involves many very different sensations. Eland states that children lack the cognitive ability to categorize this multiplicity of sensations as one concept.

It is Eland's opinion that injections are "unacceptable pain relief alternatives" for children between the ages of four and 10 years. Although injections are perceived as painful by adults, they have the cognitive means necessary to compare that pain to the pain from which they are seeking relief, and to comprehend that the effect of the injection will be delayed. The child perceives no immediate benefit from the injection, and Eland has observed that children who are capable of accurately reporting sensations of pain will no longer admit to having pain when they see the injection as a consequence.

Eland further explains that when the pediatric patient in pain is hospitalized, he may experience overwhelming fear due to hospitalization, which increases the magnitude of the pain experience and may prevent acceptance of therapeutic interventions. Assessing the child's pain also increases in complexity, since sadness, depression, and withdrawal, all possible symptoms of pain, may also be reactions to

hospitalization itself.

Similarly, Swafford and Allan (1968) note that restlessness and irritability may be interpreted as symptoms of pain in children, but could also be caused by hypoxia, fear, fatigue, hunger, or separation anxiety. It is the opinion of Gildea and Quirk (1977) that complaints of pain in a child may have a symbolic meaning. The child may complain of physical pain to express other needs.

As early as 1952, Anna Freud conducted a study to identify differences in children's sensitivities to pain, utilizing her observations as well as those of the subjects' mothers. She determined these differences to be due to the "psychic meaning of pain." Pain caused by external factors, such as injuries or surgical interventions, was often perceived as maltreatment, harm, or punishment, and was accompanied by anxiety. Freud noted that any pain accompanied by anxiety was remembered for a long period of time by the child, even if the pain was minor.

Bernstein (1965) refutes the belief that anxiety has a less significant effect on the pain experience in children, as opposed to adults. He found that the child's lack of understanding of the pain experience may make his anxiety about pain more severe than in the adult.

Mc Caffery (1969) identifies six categories of behavioral responses observed in children experiencing pain--physiologic responses, verbal statements, vocalization, facial expressions, body movements, and changes in response to the surrounding environment. She points out,

though, that in young children who have not mastered the use of language, vocalization and even facial expressions become extremely important indicators of the pain they are feeling.

In another publication, Mc Caffery (1977) discusses the process of adaptation in reference to the lack of reliability in using physiological measures as indicators of pain. When pain persists over the course of time, adaptation occurs as physiological parameters return to near normal. Children may also adapt their behavioral responses to pain, and fatigue may lead to a further minimization of expressions of pain.

Eland (1983b) points out that children's reactions to pain are not always like their adult counterparts, and cannot be interpreted as such. She states that because a child is active, nurses often assume that he is not experiencing pain. The child's activity, however, may actually be a means of coping with, escaping, or being distracted from the pain.

Abu-Saad (1981) states that active coping with a situation is indicative of psychologic health, and is supportive of healing. Coping strategies are described as being either direct or indirect. Since direct coping strategies, such as running away or kicking the nurse, cannot be utilized within the constraints of the hospital situation, the pediatric patient in pain generally must utilize indirect, or intrapsychic strategies. Examples of these strategies include attempts at intellectual understanding of the situation, distraction, and use of defense mechanisms.

It is noted by Epstein and Harris (1978) that depression is not well recognized as a reaction to pain in children. In their observations, it does occur, and almost always is noted when the pain is present for longer than six months, or chronic. They have also observed that chronic pain in children is often accompanied by psychological problems. These children are socially restricted, are impeded in progressing to the next developmental stage, and may adversely affect other family members by their pain complaints.

Cowherd (1977) notes that for any pediatric patient in pain, the pain may represent a threat to developmental needs. Analysis of how a child at a particular age level perceives and reacts to pain should be carried out. The child's normal developmental needs should be understood, and interventions to assist him in meeting those needs should be included in the plan of care.

Pediatric Pain Assessment Instruments

In developing instruments for pain assessment in the adult patient, most researchers did not take into consideration the communicative and cognitive deficits of the child. Most such instruments, then, are inappropriate for use with pediatric patients. In order to gain information about pain in individual pediatric patients as well as to develop new insights into pediatric pain in general, researchers have recently begun to direct efforts at developing appropriate and valid pain assessment tools for use with children.

Petrovich (1957) was the first to develop a projective instrument

for studying pain in adult patients. Pictures depicting individuals in various painful situations were viewed by the subjects, who then were asked to describe the intensity and duration of the pain depicted. It was concluded that the apperception of pain in others is a valid means of studying pain perception in adults. Several of the efforts directed at developing a pediatric pain assessment tool have been based on the work of Petrovich, and involve projective instruments.

Scott (1978) developed a projective test in an attempt to identify sensory, cognitive and affective factors associated with children's pain. The instrument was composed of two sections. A sequence of pictures showed self-inflicted and physician-inflicted painful events, and pain sensation sheets described five qualities of pain--color, texture, shape, pattern, and continuity. Of the 58 subjects, ranging in age from four to ten years, the children under seven years of age responded more frequently in a manner related to sensation, consistent with the pre-operational, intuitive cognitive patterns characteristic of this age group, as opposed to the more advanced cognitive perception characteristic of the older children.

The Pediatric Pain Inventory is a projective instrument developed by Lollar, Smits, and Patterson (1982) to collect data on children's perceptions of pain, focusing on intensity and duration. Six pictures depicting painful events were constructed for each of four settings--medical, psychosocial, recreational, and daily living. Two-hundred-forty subjects between four and nineteen years of age were interviewed, and questioned regarding the responsibility for the situation depicted,

whether the youngster depicted needed assistance, who would provide it, and what would they do. They were also asked to rate the depicted pain with regard to intensity, based on a color scale, and duration.

Internal consistency was high in responses in the psychosocial, recreational, and daily living areas and lower in the medical area. Those findings indicate that children's perceptions of pain are consistent when the pain involves common experiences, but less consistent with types of pain where experiences are more diverse. There was a low correlation between ratings of intensity and duration, indicating that the child perceives these as two distinct dimensions of the pain experience. In ranking the pictures in order of intensity, a depiction of a child with a bandaged leg sitting on a doctor's examining table was ranked as the most intense. A picture of a child receiving an injection was ranked seventeenth in intensity and twenty-third in duration.

Eland (1983a) conducted over ten years of research directed at the development of a pediatric pain assessment tool. In her initial effort, 25 hospitalized children between four and eight years of age were presented with five pictures of a cartoon dog in painful situations of different intensities. Each subject was asked to pick the picture which represented the pain he was currently experiencing and then rank the pictures in sequence from least to worst pain. Eland found that all the children identified that the dog was in pain; however, rankings were not consistent between different children. On the other hand, 76% of the subjects ranked the pictures in the same order on two

separate occasions.

Additionally, the subjects were asked the question, "What is pain?" Over one-half the children did not know the meaning of the word pain. This finding implies that identification of a word that the child uses and understands to represent the pain experience is necessary when intervening with children in pain.

In revising her projective tool, Eland tested rankings made by 20 subjects of four pictures of a chimpanzee in different painful situations. Subjects ranked the pictures consistently on three successive days, but there was still no consistency in ranking between the children. Following this revision, Eland abandoned the use of depictions of cartoon characters in order to avoid potential conflicts between fantasy and actual perception of pain.

Eland then began developing her body outline tool. In her pilot study, children were asked to **place** an "X" on a body outline of a child to identify the location of their pain. The subjects were able to identify areas on the body outline consistent with their pathologies.

The instrument was further revised so that the subject was asked to color the painful area rather than simply identify an area with an "X". Again, the subjects were able to locate the areas appropriately, but additionally could appropriately identify some degrees of intensity of their pain.

In the final revision of the body outline instrument, subjects were first asked to select colored crayons to represent severe, moderate, slight, and no pain, and then color their painful areas on the body

outline. This tool allowed the children to describe the intensity of their pain more specifically.

The Poker Chip Tool was developed by Hester (1979) and piloted with 42 children between four and seven years of age receiving intramuscular injections. Subjects' ratings of pain were compared with ratings based on a modification of Eland's original projective tool, and behavioral responses to the pain during the injection were observed. Each subject was given four white poker chips, representing "pieces of hurt," and was asked to select the number of poker chips to describe how he felt during the injection. There was no significant correlation between results obtained with the two tools, as 22 children denied pain using the Poker Chip Tool, but none of the children placed the picture involving the injection at the lowest level of pain.

Significant positive correlations were found between vocal responses (i.e., crying, moaning) and responses to Eland's tool, and verbal responses (i.e., words, sentences) and responses to Hester's tool. A positive, but not significant, correlation was found between verbal responses and responses to Eland's tool. Significant negative correlations were found between facial expressions and responses to both tools, and between motor responses and responses to Hester's tool. Implications noted were that verbal and vocal responses to pain would be considered valid indicators of pain being experienced. Facial expressions and motor responses could not be viewed as valid indicators of pain being experienced, but may possibly be used by children as gating mechanisms to reduce pain, in Hester's opinion.

Developmental Characteristics of the School-age Child

An understanding of the characteristic cognitive and communicative capacities of a child in a particular age group has been noted to be crucial in intervening with the child in pain. Particular characteristics of the school-age child must be understood, then, prior to considering this study.

Sigmund Freud describes the child from the age of seven years until puberty as being in the "latency" stage of his psychosexual theory of development, because it is during this period when sexual drives are sublimated in reaction to societal expectations. This signifies the initial development of a conscience, and of a sense of self-control. During this stage, Freud feels that the child must deal with varied developmental pressures, including peer relations, school achievement, moral and ethical concepts, and relationships with adults. The child's basic goal is to learn to integrate new experiences; it is his role as a "learner" that provides him with some security from anxiety (Kenny & Clemmens, 1980, pp. 22-26).

Erikson (1963) places the school-age child in the stage "Industry versus Inferiority." He has learned to master simple physical tasks, and now aims toward the goal of bringing a productive situation to completion, or to develop "the fundamentals of technology." Developmental stress occurs when the child encounters "outer and inner hindrances" in the use of his new capacities, leading to a sense of inadequacy and inferiority, and regression to the previous stage, "Initiative versus Guilt."

Piaget's theory states that the child between the ages of seven and twelve years is in the concrete operational stage of cognitive development. It is at this point where the child's cognitive functions evolve from the utilization of sensory perception toward the utilization of intellectual functioning. During this stage the child begins to use logical reasoning, but his problem solving abilities are restricted to questions involving objects physically present, or imagined as real; he cannot reason in the abstract realm until adolescence. The child in the concrete operational stage is able to reason by means of "logical inclusion"--he can classify objects according to similarities or differences, include subclasses within general classes, and recognize one part as being complementary to the rest. Egocentrism decreases, and the child becomes more aware of physical and social realities around him, leading to the increased development of language competencies, as he begins to reflect ideas originating outside himself. Two newly developed cognitive skills, reversibility, the ability to return to the starting point of a mental sequence, and decentration, the ability to attend to more than one physical characteristic at a time, lead to the attainment of another new cognitive skill, conservation, the realization that objects remain stable regardless of changes in their physical characteristics (Lugo & Hershey, 1974, pp. 48-49).

Sears applied the social learning theory to the study of child development. He sees the child in constant interaction with the environment, with development of new and higher levels of functioning dependent upon the amount that his behavior is influenced by the environment

to conform to the goal of the socialization process, adulthood. During the school-age period, the child seeks extra-familial learning experiences. This represents development from earlier stages of family-centered learning--the child begins moving away from dependency by social penetration into the neighborhood and beyond. Controls on the child's behavior must be universally defined and strictly reinforced. His goals are no longer found in immediate rewards, but in the form of social approval, as he begins to function in the secondary motivational system (Sahler & Mc Anarney, 1981, pp. 57-60).

Nagera (1978), a child psychiatrist, states that before the age of eleven or twelve years, due to concretism and the animistic qualities of his thought processes, the child's tendency is to interpret illness and pain as punishment resulting from bad behavior. This is especially true in the case of injuries incurred while transgressing parental limits. In older school-age children, loss of control over the management of bodily functions in a traumatic situation leads to increased anxiety. Nagera also is of the opinion that children in this age group have a lower threshold for pain tolerance when compared with adults, due to a lack of necessary ego sources to maintain control when confronted with pain, fear, tension, or anxiety. The traumatic situation overwhelms the ego and leads to disorganization and inappropriate, maladaptive responses.

Gildea and Quirk (1977) explain that the school-age child's level of cognitive function allows him to understand the reasons for pain and to relate them to improved health. He is also capable of

identifying that the pain experience is time-limited. These authors also state that unfamiliar situations and uncertainty about upcoming events and expected responses may lead to regression and dependent behavior in this age group.

Wieczorek and Natapoff (1981) point out that the young school-age child understands the concept of health, but has difficulty understanding health and illness as a continuum, and may feel that once he becomes sick, he will never recover. These children see illness as a diffuse state, and rely on others to tell them when they are ill. Older school-age children, on the other hand, can identify the illness states, report bodily discomfort, and recognize illness as being caused by specific factors (pp. 787-789).

Mc Bride (1977) sees the school-age child's preoccupation with bodily functions as leading to an exaggerated fear of death and bodily injury, as well as causing him to draw all attention to himself, limiting his awareness of and involvement in his surroundings. In regard to anticipated painful experiences, he needs to be told exactly what to expect, when to expect it, and what the acceptable behavioral responses are. He also needs to be given the opportunity to verbalize fears related to pain, allowing his thoughts to become more reality-based and less vague and fantasy-based.

Belmont (1970) states that during the school-age period, the effects of separation anxiety due to hospitalization decrease, but the child may feel threatened with loss of control. Restrictions and dependency imposed by hospitalization serve as threats to recently acquired

independence.

In a study involving 96 children between the ages of four and seventeen years, Gellert (1978) found that knowledge of the structure and function of the human body differs in children of different ages, and noted such knowledge to be markedly increased in school-age children. The number of body parts identified rose steadily with age, but the sharpest increase was in the nine-year-olds. Only children over nine recognized the existence of the brain, and above age nine, answers about structure and function were generally more accurate.

Several studies have led to insights regarding fears of the school-age child. Bauer (1976) found that most school-age children feared bodily injury and physical dangers. Unrealistic fears, such as those of animals, ghosts, and monsters, were prevalent in younger school-age children but decreased sharply after age ten. Maurer (1965) also found the fear of non-existent entities to decrease after age ten.

Jessner, Blom, and Waldfogel (1952) found that in hospitalized children between the ages of five and seven years, most of their anxiety was focused on the actual hospitalization and separation, but the children were also fearful of specific aspects of hospitalization--surgical procedures and hypodermic needles in particular. In children between the ages of seven and ten years, fear of hypodermic needles decreased, but anxiety was focused approximately equally on hospitalization and separation, surgical procedures, and anesthesia. In older children, the greatest fear was of anesthesia, with fears of surgical procedures

being the next most frequent.

Adams and Berman (1965) found that the majority of the 40 hospitalized children between the ages of six and nine years who were questioned associated hospitalization with pain. In response to the question, "What happens to a child in the hospital?", over 50% of the subjects offered answers involving "needles" or injections.

In a study to identify the school-age child's interpretation of and fantasies related to bandages and injuries concealed by bandages, Howe (1967) noted a strong tendency for her subjects to identify physical activity as playing a role in injury. She also noted that all of the 21 subjects expressed anxiety about body damage. A variety of responses were obtained, pointing to the individuality of children in this age group, and in her opinion, the necessity for individualized planning of nursing care.

Two studies have been conducted by nurses in attempts to identify information about perceptions of the pain experience at the school-age level. A study by Schultz (1971) involved 74 well children ten and eleven years of age. A group of researchers used a sample of 100 hospitalized children and 114 well children, ranging in age from nine to twelve years, as subjects for another study (Savedra, Gibbons, Tesler, Ward & Wegner, 1982; Savedra, Tesler, Ward, Wegner & Gibbons, 1981; Tesler, Wegner, Savedra, Gibbons & Ward, 1981).

Schultz questioned her subjects regarding causes of painful experiences, their reactions to painful experiences, and what pain meant to them. Of possible reactions to pain presented, from which the

subjects were asked to select the most appropriate, boys in the group most frequently selected "brave," but also selected "nervous" and "afraid." This was assumed to indicate a conflict between meeting societal expectations and actual feelings when experiencing pain. Schultz noted that expression of emotions by girls in this age group is more acceptable. Concurrently, all of the female subjects admitted to being "afraid" or "nervous," more than half said they "wanted to cry, but didn't," and six admitted that they would cry. Schultz concluded that the fact that only eight subjects responded that they "wanted to cry and did" pointed to the emerging control of strong feelings in this age group. She saw as an implication for nursing the need for support and reassurance even for children who don't express their emotions in painful situations in this age group.

In the second study (Savendra, et. al., 1982; Savendra, et. al., 1981; Tesler, et. al., 1981), eight questions regarding perceptions of pain, some open-ended and some closed-ended, were presented to the subjects. Regarding causes of pain, hospitalized children generally listed physical internal causes, while well children noted external factors. Some older subjects included psychological factors (i.e., "...when my mother leaves after visiting") in their responses. When hospitalized children were asked to indicate the worst pain they had ever experienced, one-third of the children listed a hospital-related example. In selecting colors to represent pain, red was the most frequent response. Responses to questions regarding reactions to pain in this study were similar to those obtained by Schultz. Hospitalized

children in the later study, however, stated more often than well children that they felt nervous and frustrated and cried.

When asked to select words related to pain from a list of 24, the researchers found that their subjects could relate pain to sensory, evaluative, and affective words. Responses selected more frequently by hospitalized children involved the evaluative and affective components--intensity, tension, and fear, in particular.

Effects of Parental Presence on Children in Pain and Stressful Situations

Though the author found no previous study focusing on the same problem researched in this investigation, related literature regarding the effects of parental presence on children in painful and stressful situations was reviewed. As early as 1955, prior to universal acceptance of liberal parental visiting for pediatric hospital patients, the Citizen's Committee on Children of New York City issued a recommendation in favor of liberal visiting. Following a survey of pediatric inpatient units, the Committee Report stated, "When a child is sick, his need for the comfort and support of his parents is even greater than usual, and when he enters a hospital the need can be almost overwhelming." (p. 710). In another early publication, nursing administrators O'Connell and Brandt (1960) stated that a policy allowing liberal visiting hours for parents was beneficial to the child and parents, as well as the nursing and medical staffs, despite difficulties involved.

Letters written by mothers of children who had been hospitalized,

as well as hospital administrators, to Robertson, a proponent of increased emotional consideration toward hospitalized children, were summarized in a book he authored in 1962. These letters were almost unanimous in the opinion that rooming-in or unlimited visiting for parents was beneficial in reducing a child's emotional trauma during hospitalization. The ability of children to endure painful procedures while parents were present was specifically noted.

Mc Caffery (1979, pp. 74-75) states that the patient's family may either contribute to the relief of a patient's pain, avoid causing increased pain, or have a detrimental effect on the pain experience. She is of the opinion that it is the responsibility of the nurse to identify the potential for increasing or decreasing the patient's pain in members of his family, and then interact with them accordingly. She notes the importance of support and preparation of parents, stating that if a parent's anxiety level is high, he may neglect to prepare the child for hospitalization, and child's subsequent anxiety may increase his pain.

Mennie (1974) notes that, as with many learning processes, a child's reactions to pain are influenced by his mother's behavior. He states that a mother's excessive concern may lead to an increased reaction to pain in the child. He also points out that a child in a state of increased anxiety is more sensitive to pain.

With regard to school-age children in particular, pediatricians Vaughan, Mc Kay, and Behrman (1979, pp. 77-79) state that reactions to separation from parents are individualized and reflect differential

characteristics of their own experiences. Separation from parents due to hospitalization is generally more frightening than being separated from parents in a familiar situation, such as staying at home with a babysitter. Nagera (1978) similarly states that even though the school-age child has reached a point where he can separate from his mother and accept maternal substitutes with little anxiety under normal conditions, he may lose this capacity in traumatic situations such as illness, pain, fear or injury. Erickson (1965) indicates that though the school-age child has difficulty tolerating adult supervision under normal circumstances, he longs for adult protection and support when experiencing pain or discomfort, or in an unfamiliar situation.

In the previously cited study by Lollar, Smits, and Patterson (1982), parents were asked to rate their child's projected pain reactions. A significant difference was found in the ratings, with the adults underestimating the intensity of their children's reactions to pain. On the other hand, Eland (1983a), in piloting her projective instrument, found that 95% of the parents of the subjects agreed with their child's report of pain.

In the study by Tesler et al. (1981), children were asked to identify factors that could relieve their pain. Thirty-nine children identified the presence of other individuals as relieving their pain, and 19 children specifically noted their parents' presence as helpful.

An unstructured observational study of 143 pre-school and school-age children hospitalized for tonsillectomies and adenoidectomies was conducted by Jessner, Blom and Waldfogel (1952). It was noted that

fears of abandonment were negated in children whose mothers stayed with them, but maternal anxiety was transferred to the child. The fact that mothers could not prevent painful interventions made the children hostile toward their mothers, and further increased their anxiety levels.

In a classic study frequently cited in the literature (Prugh, et al., 1953), researchers examined the nature of reactions and modes of adaptation of hospitalized children and their parents, and the degree to which these reactions could be modified through an experimental ward management program. Parental visiting was one of the variables manipulated. Normal ward policy allowed parents to visit only two hours per week, with little encouragement for participation in the care of their children, while during the experimental period daily parental visiting was allowed and participation in daily care of the children by the parents was encouraged. In the control group of children ages six to twelve years, Prugh identified some anxiety of parental separation, but generally anxiety was free-floating or attached to potentially painful or threatening experiences. Following the experimental period, Prugh noted less anxiety and less strenuous use of defense mechanisms. Fantasies and anxieties were expressed more freely, in appropriate ways such as verbalization and acting out in play.

In the field of pediatric dentistry, Frankl, Shiere, and Fogels (1962) investigated the effects of maternal presence during dental treatment. Observers rated behaviors of 112 children between three and one-half and five and one-half years of age on an interval scale

during two dental visits. One-half of the children were accompanied by their mothers during the visits, and the remaining children were not. The children who were accompanied by their mothers during the visits exhibited less negative behavior, but in the portion of the group older than 50 months of age, the difference was not significant. The researchers did note that in no instance did the mother present a disturbing influence.

Hamovitch (1964) attempted to evaluate help provided by a parent participation program involving unlimited visiting and participation in care of terminally ill children at the City of Hope Medical Center. Subjects ranged in age from infancy to 15 years. Hamovitch concluded that in 68% of the cases where parents participated to a significant extent, the program was effective in helping families to make a reasonable adjustment to illness and hospitalization. In 37% of the families, the program was judged to be very helpful. In 32% of the families studied, though, some negative effects occurred.

The effects of maternal presence during anesthesia induction were examined by Schulman, Foley, Vernon, and Allen (1967). Mood during induction was observed and a post-hospital questionnaire regarding changes in behavior was completed for 32 children between the ages of two and six years admitted for tonsillectomies and adenoidectomies. Mothers accompanied children during anesthesia induction in one-half of the group. Though statistical analysis resulted in no significant findings, the authors viewed the mother's presence as beneficial in that in no instance was the mother upsetting to the child, and all the

mothers commented favorably about the experience.

Brain and Maclay (1968), as part of a study evaluating the effects of rooming-in, compared adjustment to hospitalization in children admitted for tonsillectomies and adenoidectomies with and without their mothers. A significantly greater number of patients exhibiting satisfactory adjustment was seen in the group admitted with their mothers.

In a study by May (1972) involving patients in a pediatric intensive care unit, it was found that pain perception could be subjectively diminished by decreasing fear. The presence of a parent at the child's bedside was associated with decreased fear and a subsequent decrease in pain.

Parental presence was associated with detrimental effects in a study carried out by Lehman in 1975. As part of this researcher's study, the relationship between maternal rooming-in and the occurrence of post-operative complications, including pain, was examined. The sample consisted of 48 three to five year olds admitted for tonsillectomies and adenoidectomies. Most of the children who requested medication to alleviate pain three or more times were those whose mothers roomed-in. This indicated to the author that the children whose mothers were present experienced more pain.

Dew, Bushong, and Crumrine (1977) conducted a survey study to determine whether parents believed visiting their children in a pediatric post-operative recovery room was beneficial to them and their children. All 57 parents who had visited their children in the recovery



room stated that if surgery was ever required again they would again choose to be present in the recovery room. Eighty-eight percent of these parents felt that their presence was in some way helpful to their children.

In another study in pediatric dentistry, Venham, Bengston, and Cipes (1978) assessed children's response to each of 207 dental visits based on heart rate, basal skin response, observer rating of clinical anxiety and cooperative behavior, and a projective self-report measure of anxiety. Data were analyzed for significant differences between children treated with and without their parents present. The authors noted no significant differences in relation to the presence or absence of the parents when all responses were combined, but did note a significant difference in basal skin response indicating that the children were more relaxed with their parents present.

Shaw and Routh (1982) conducted two separate studies, one involving 20 subjects between 18 and 26 months of age, and the other involving another 20 subjects between 59 months and five years of age. Ten in each group were randomly assigned to receive routine immunizations with their mothers present, and the other ten without their mothers. In both groups, children whose mothers were present exhibited more negative behavior. The researchers interpreted these results as indicating that children are more likely to be comforted when their mothers are present, so they elicited behavior which leads to comforting measures from their mothers.

Finally, Eland (1983a) studied the effects of parental presence

on the frequency with which hospitalized children were given pain medications. An inverse relationship was found between the amount of time a parent was present and the frequency with which the child received analgesics. Eland inferred that the amount of comfort provided by the parent decreased fear and anxiety, which are involved in the pain experience.

Summary

Specific physiological mechanisms by which an individual perceives sensations of pain have been isolated, and can be described in detail. Additionally, researchers as well as clinical practitioners working with patients in pain have identified non-physiological factors as capable of influencing the patient's perception of the pain he is experiencing. The Gate Control Theory provides speculative evidence that these non-physiological factors may perform a specific function in the physiological process by which pain is perceived in the central nervous system.

Special implications related to studying pain and working with patients in pain in the pediatric population have been identified. Developmental factors affecting cognition and interpersonal interactions result in differences in the understanding of and perception of, as well as the reaction to, the pain experience in a child. Nursing implications for the assessment and management of pain in children are based on an understanding of these developmental characteristics.

The school-age child is described as being able to utilize

logical reasoning in solving problems of a concrete nature. As compared with the younger child, whose perceptions are purely egocentric, the school-age child develops an increased awareness of social and environmental realities.

Achieving some independence from the family and successful participation in physical activity are important tasks for the school-age child. At this developmental stage, the child also becomes aware of societal expectations, and strives to meet them.

Research studies have indicated that the school-age child is able to describe perceptions of the pain he experiences, often relating pain to physical harm, death, and punishment, and is able to address the sensory, evaluative, and affective natures of the pain experience. Separation from parents at this developmental stage is described as having variable effects, dependent upon specific characteristics of the individual child, as well as the situation in which the separation occurs.

Investigations involved in determining the effect of the parent's presence in situations where children are undergoing stress have resulted in variable findings. In most such studies, it has been concluded that the presence of a parent has either been helpful to the child or has had no effect.

No studies to date have been found by this investigator specifically directed at relating parental presence to pain perception in the school-age child. Therefore, by means of this investigation, the researcher attempted to answer the question of whether or not parental

presence exerts an influence, be it positive or negative, on pain perception in the school-age child.

DEFINITION OF TERMS

Parent

Parent was defined as a natural or legal guardian. In cases where a natural or legal guardian did not assume continuing responsibility for the child, parent was defined as that individual who did assume that responsibility.

Parental Presence

The independent variable in this study was described as the presence of either one or both parents in the child's room or at his side. In order to minimize the immediate effects of separation from or reunion with a parent, the investigator specified time requirements to be met before an observation with a parent present or absent was made. For the purposes of this study, a parent was considered to be present when he was in the child's room or at his side for at least one hour. A parent was considered not to be present when he was not in the child's room or at his side for a period of at least 30 minutes.

Perception of Pain

Based on the ideas of both Mc Caffery (1979) and Stewart (1977), the investigator defined the perception of pain as the subject's self-report of any physical discomfort he was experiencing. The perception of pain was specifically measured through the use of the Eland Color Tool (Eland, 1983a) and a 10-centimeter scale.

School-age Child

The investigator defined the school-age child as a child between the approximate ages of six and twelve years. These children are capable of thinking in concrete terms and are beginning to use logical reasoning. For the purposes of this study, the school-age child was operationally defined as a child at least six years old, but not yet twelve years old, who has not been previously diagnosed as having a delay in mental development.

Elective Surgical Procedures

Surgical procedures for which the child's admission into the hospital was scheduled were understood to be elective surgical procedures. Such surgeries were distinguished from procedures which had been scheduled following emergency admissions or admissions for undiagnosed problems.

HYPOTHESES

I. A difference in the school-age child's perception of pain, as measured using the Eland Color Tool, occurs when a parent is present, as compared to when a parent is not present.

II. A difference in the school-age child's perception of pain, as measured using the 10-centimeter scale, occurs when a parent is present, as compared to when a parent is not present.

ASSUMPTIONS

The investigation was based on the following assumptions:

- 1) Pain is a multi-dimensional experience. Perceptions of pain may be affected by physiological as well as non-physiological factors (Beecher, 1956; Bobey & Davidson, 1970; Jacox, 1977; Melzack & Torgerson, 1971; Melzack & Wall, 1977).
- 2) Children experience pain (Swafford & Allan, 1968).
- 3) The pain experience is unique for children of different developmental levels, as well as for children in general, as opposed to adults.
- 4) Pediatric patients are able to describe their own pain by means of projective instruments (Eland, 1983a).
- 5) It is the responsibility of the nurse to assess whether or not members of a patient's family may potentially increase or decrease the patient's pain perception. The nurse must then interact with those family members accordingly (Mc Caffery, 1979, pp. 74-74).

RESEARCH DESIGN

Overview

A quasi-experimental design was utilized to conduct the study. Data regarding one dependent variable was collected from one group of subjects under two different conditions. Information about the subjects' perceptions of pain obtained while their parents were present and while their parents were not present was then compared to identify whether or not these perceptions differed in the two situations.

Setting

The study was conducted on the 25 bed pediatric inpatient unit at State University Hospital in Syracuse, New York. State University Hospital is part of the State University of New York Upstate Medical Center at Syracuse. The 250 bed hospital is affiliated with several schools of medicine and nursing for use as a teaching facility.

The pediatric unit serves as a regional referral center for pediatric medical and surgical patients from all of Central New York State. Primary nursing is utilized on the unit, and one parent is allowed to room-in with each patient if desired.

Sample

The target population considered in this study included all school-age children involved in pathological or diagnostic situations where pain may be experienced. The sample included 12 school-age

children hospitalized for elective surgical procedures.

Subjects were selected by convenience sampling. Names of all the scheduled surgical admissions within the specified age range over a four month period were obtained from the pediatric unit admission schedule. Verbal permission was obtained from each subject's attending surgeon prior to his inclusion in the study.

Children who were scheduled for open heart surgery and would spend their initial post-operative days in the pediatric intensive care unit, as well as children anticipated by their surgeon to be discharged on the day of surgery or early on the first post-operative day were not included in the study. Surgical patients with myelomeningocele were also excluded from the sample, due to altered pain sensation.

Following admission for the surgical procedure, the primary investigator met with each surgical candidate and one or both parents, explained the study in detail, and questioned the child and parents as to whether or not they would be willing to participate. All the surgical candidates interviewed and their parents agreed to participate in the study. An informed consent (see Appendix C) was then obtained from one or both parents, and an informed assent (see Appendix D) was obtained from each subject.

Data Collection Instruments

Two research tools were selected to be utilized for data collection. Both have been described in the literature as being appropriate

means of measuring pain perception in school-age children.

The final modification of the Eland Color Tool (Eland, 1983b), as previously described, was the primary instrument selected for use in this study. The tool involves providing each child with two body outlines--one front view of a child, and one back view (see Appendix A). The child is also provided with eight crayons--yellow, orange, red, green, blue, purple, brown and black. From these eight crayons, the child must select four, each to represent a different degree of pain that he has experienced--severe pain, moderate pain, slight pain, or no pain. For example, an individual child may select a red crayon to represent the worst pain he has experienced, orange to represent moderate pain, brown to represent slight pain, and blue to represent the absence of pain. The child is then asked to color on the body outline areas where he is currently experiencing pain, using the appropriate color that corresponds to the intensity of his pain.

For purposes of data analysis in this study, the ranked colors as chosen by each individual subject were assigned numerical values, thus constructing an ordinal scale. Each child's color representing the most severe pain was assigned a value of four, his selection representing moderate pain a value of three, the color chosen to represent mild pain a value of two, and the color chosen to represent no pain a value of one. For the purpose of facilitating numerical analysis, each time the tool was administered the child was asked to color in only one of the four selected colors--that which most represented the pain he was experiencing at the time.

Though the final modification of the Eland Color Tool is the result of over ten years of development through multiple studies, there is no statistical data indicating the reliability of the tool. Still, results of Eland's pilot studies indicate that the tool is a reliable measure of self-reported perceptions of pain in children.

In an early pilot study, in which each subject was simply asked to identify areas of pain on the body outlines with an "X" of the color chosen to represent his pain, 181 children out of a total sample of 186 were able to accurately locate the source of pain on the body outline and provide explanations for their pain consistent with their pathology. In a subsequent study, when subjects were asked to color the area where pain was experienced rather than just noting the location with an "X", results were consistent with those of the earlier study. In addition, several children identified areas of pain that were inconsistent with their known pathology, and subsequently developed clinical signs and symptoms of new pathology in the areas they had identified as painful. Subjects were also able to provide information with respect to the intensity of their pain. During the post-operative period, for example, the most intense coloring occurred immediately following surgery, and changed to smaller areas of coloring as the post-operative time increased (Eland, 1983a).

Stewart (1977) points out that the reliability of any pain assessment tool is difficult to establish, due to the subjectivity of the pain experience and multiple intervening variables. As a means of controlling reliability and validity in pain assessment, Stewart

suggests the multiple measurement approach, comparing data collected utilizing more than one instrument.

A 10-centimeter scale was utilized in conjunction with the Eland Color Tool (see Appendix B). A scale of un-numbered increments one centimeter apart, with the left end of the scale identified as representing no pain and the right end representing very severe pain, was presented to each child, and he was asked to place an "X" on the scale to represent his current pain.

Data obtained using the 10-centimeter scale was analyzed on a ten point ordinal scale. Ordinal values were assigned to marked intervals on the scale, with numerical values increasing as the level of perceived pain increased. A value of one was assigned to an "X" placed at or before the mark one centimeter from the left end of the scale, a value of two to an "X" placed at or before the mark two centimeters from the left end of the scale, and so on. The highest numerical value, 10, was assigned to an "X" placed beyond the mark nine centimeters from the left end of the scale.

Abu-Saad and Holzemer (1981) administered such a scale to ten post-operative patients between the ages of nine and 15 years, and determined that the subjects' responses on the scale corresponded with behavioral and physiological indicators of pain, a criterion measure of validity. They suggested that the 10-centimeter scale be used, in conjunction with other instruments, as a tool for measuring children's self-assessment of pain.

Collection of Data

Following admission for the surgical procedure, after the study was explained and the informed consent and assent were signed, basic descriptive information about each child and his family, as well as data about the child's previous hospitalizations and surgeries, was recorded. Information about terms each child uses to describe pain (i.e., "hurts," "owies") was also obtained (see Appendix E). The child's word for pain was then used by the investigator in all subsequent contacts with the child.

During this preliminary interview, the child was instructed in the use of each tool, and then was asked to assess his perception of the pain involved in a painful situation which he had previously experienced. In most cases, this assessment was made of the pain experienced during pre-operative blood drawing. At this time, the investigator also questioned the parents regarding times that they planned to be at the bedside during the day following surgery, so that subsequent interviews could be planned.

On the day following the child's surgery, the primary investigator visited each subject twice--once with one or both parents present, and once while neither parent was present. Data collection was carried out on the first post-operative day rather than the day of surgery in order to avoid threats to the internal validity of the study due to immediate post-anesthesia effects on the child's level of consciousness and comfort. The two visits were made at least one but no longer than four hours apart.

For one subject, data collection was carried out on the second post-operative day. On the first post-operative day, her decreased level of consciousness related to the frequent administration of narcotic analgesics to relieve her pain impeded reliable response on the data collection instruments.

Seven of the subjects (58%) were interviewed first with a parent present and second without a parent present. With the remaining five subjects (42%), visits were made in the opposite order. By alternating the order of the data collection interviews as much as possible, an attempt was made to control the effects of increased familiarity with the instruments as well as with the investigator upon the internal validity of the study.

The effects of analgesic medications presented another potential threat to the internal validity of the investigation. In order to exert some control over this intervening variable, if subjects were receiving "as needed" pain medications, visits were not made during the period when the medication was seen as significantly affecting pain perception. For example, if a pain medication was ordered, "every four hours as needed," no observations were made during the immediate four hour period following administration of a dose of the medication. Exceptions were made in cases where subjects received pain medications every four hours or more frequently. In such instances, equal post-medication time intervals were allowed prior to each visit.

During each visit, the investigator briefly reviewed each tool with the child, and asked the child to assess the pain that he was

experiencing at the time. Following each interview, information regarding the time of the child's last pain medication as well as the drug, the dosage, and the route of administration was recorded.

RESULTS

Description of the Sample

The sample included 12 school-age children hospitalized for elective surgical procedures. Descriptive information regarding individual subjects in the sample is found in Table 1.

Seven girls (58%) and five boys (42%) were included in the sample. The mean age for the subjects was 8.8 years, with a standard deviation of 1.6. Subjects ranged in age from six to eleven years. One subject was six years old, three were seven years old, three were nine years old, three were ten years old, and two were eleven years old. The majority of the subjects had siblings, with the most frequent number being two.

Interestingly, eleven of the subjects (92%) had been previously hospitalized, and ten (83%) had undergone previous surgical procedures. One subject had a history of six previous hospitalizations and six previous surgeries.

With respect to the surgical procedures the children were hospitalized for at the time of the study, seven underwent urological procedures and the remaining five underwent orthopedic procedures. Information regarding the specific surgical procedure that each subject underwent is found in Table 2.

Responses

Overall, the majority of the subjects indicated that they were

Table 1

Descriptive Data for Individual Subjects

<u>Subject Number</u>	<u>Age</u>	<u>Sex</u>	<u>Number of Previous</u>		<u>Lives With</u>	<u>Number of Siblings</u>
			<u>Hospitalizations</u>	<u>Surgeries</u>		
1	10	F	3	1	both parents	2
2	7	M	6	6	both parents	3
3	9	F	1	1	grandparents	4
4	9	F	1	1	both parents	2
5	9	F	0	0	both parents	2
6	7	M	1	1	both parents	1
7	7	F	4	4	both parents	2
8	10	F	2	1	both parents	2
9	11	M	3	2	both parents	7
10	6	M	1	1	both parents	2
11	10	F	2	0	both parents	1
12	11	M	5	3	mother	0

Table 2

Specific Surgical Procedures

<u>Subject Number</u>	<u>Surgical Procedure</u>
1	bilateral ureteral reimplantation
2	hypospadias repair
3	removal of left tibial hardware
4	resection of multiple fibromas from left hand with bone graft from left fibula
5	bilateral ureteral reimplantation
6	bilateral ureteral reimplantation
7	creation of right ileo-ureter
8	bilateral ureteral reimplantation
9	bilateral heel cord lengthening
10	hypospadias repair
11	excision of bone cyst from right femur with bone graft from right iliac crest
12	bilateral tibial osteotomies with Rush Rod

experiencing pain using both data collection instruments under both conditions--with and without a parent present. Only one subject denied pain using both tools under both conditions. His parents had stated prior to both visits that the child had a history of reluctance to complain of pain or request pain medications.

With respect to the intensity of pain, using the Eland Color Tool, with the numerical correlate of 4 representing the most severe pain, 83% of the subjects, at at least one of the testing periods, described their pain as a 3 or 4. On the 10-centimeter scale, with the numerical correlate of 10 representing the most severe pain, 92% of the subjects rated their pain as a 5 or greater.

In considering the independent variable of parental presence or absence, four subjects indicated on both instruments that their perceived level of pain was lower when a parent was present than when a parent was not present (see Table 3). The level of perceived pain in three subjects was lower when a parent was present when assessed using the 10-centimeter scale, but at the same level on both occasions when assessed using the Eland Color Tool. One subject's perceived level of pain when a parent was present was indicated to be lower than when a parent was not present on the Eland Color Tool, but unchanged on the 10-centimeter scale. In one case, a subject's perceived level of pain increased when a parent was present when described using both the Eland Color Tool and the 10-centimeter scale. The remaining three subjects indicated their perceived pain to be at the same level when a parent was present and when a parent was not present using both

Table 3
Individual Subject Responses

<u>Subject Number</u>	Responses to Eland Color Tool		Responses to 10-Centimeter Scale	
	<u>Parent Not Present</u>	<u>Parent Present</u>	<u>Parent Not Present</u>	<u>Parent Present</u>
1	4	3	10	10
2	1	1	1	1
3	3	2	6	1
4	4	3	8	5
5	4	3	10	8
6	4	4	5	5
7	4	4	9	8
8	3	2	5	1
9	4	4	8	3
10	3	4	4	9
11	3	3	6	6
12	2	2	5	4

instruments. For those subjects that indicated a change in the level of perceived pain when a parent was present, as opposed to when a parent was not present, the direction of the change was the same when pain was assessed on both tools.

Analysis of Data

Since both the Eland Color Tool and the 10-centimeter scale yield ordinal data, the Wilcoxon matched-pairs signed-ranks test for dependent samples was used to statistically determine if there was a significant difference in the amount of pain perceived by the subjects in the presence of a parent versus the amount of pain perceived in the absence of their parents. Results from each instrument were analyzed separately.

For each subject, the difference between the numerical correlate to the color used to describe pain on the Eland Color Tool when a parent was present and the numerical correlate to the color used to describe pain when a parent was not present was calculated. The differences for the sample were then ranked, irrespective of algebraic sign, and the ranks with the less frequent sign were summed. The value obtained, T , was tested for significance at the level of 0.05 on the table of critical values for the Wilcoxon matched-pairs signed-ranks test. If the value obtained was less than or equal to the critical value indicated on the table of critical values of T at the stated level of significance, Hypothesis I was accepted. Hypothesis II was tested in the same way, using numerical correlates of pain assessed

on the 10-centimeter scale.

Hypothesis I states that a difference in the school-age child's perception of pain, as measured using the Eland Color Tool, occurs when a parent is present, as compared to when a parent is not present. A summary of the statistical testing of Hypothesis I is presented in Table 4. When using the Wilcoxon matched-pairs signed-ranks test, differences of zero, since they represent neither positive nor negative changes, are not ranked. Therefore, subjects who gave the same response to the Eland Color Tool on both administrations of the instrument produced a difference of zero, and for purposes of data analysis, were eliminated from the n . Hence, Hypothesis I was tested based on $n = 6$. The obtained value for T was compared to the critical value for $n = 6$ at a 0.05 level of significance, and Hypothesis I was rejected. Thus, results of this study did not indicate a significant difference in the school-age child's perception of pain, as measured using the Eland Color Tool, when a parent was present, as compared to when a parent was not present.

Hypothesis II states that a difference in the school-age child's perception of pain, as measured using the 10-centimeter scale, occurs when a parent is present, as compared to when a parent is not present. Statistical testing of Hypothesis II is summarized in Table 5. As in testing Hypothesis I, subjects whose responses to the 10-centimeter scale were unchanged on both occasions were eliminated from the n . The obtained value for T was compared to the critical value for $n = 8$ at a 0.05 level of significance, and Hypothesis II was rejected. Thus,

Table 4
Statistical Testing of Hypothesis I

Subject Number	1	2	3	4	5	6	7	8	9	10	11	12
Difference between responses	-1	0	-1	-1	-1	0	0	-1	0	1	0	0

Ranking of Differences^a

(-) 1 - 3.5

T = 3.5

(-) 1 - 3.5

n = 6

(-) 1 - 3.5

T > 0 (Critical value of T
at 0.05 level of
significance)

(-) 1 - 3.5

(-) 1 - 3.5

(+) 1 - 3.5

Hypothesis I Rejected

^a The rank assigned to equal differences is the mean of the ranks that each of these differences would have occupied had the differences not been the same.

Table 5
Statistical Testing of Hypothesis II

Subject Number	1	2	3	4	5	6	7	8	9	10	11	12
Difference between responses	0	0	-5	-3	-2	0	-1	-4	-5	5	0	-1

Ranking of Differences^a

(-) 1 - 1.5

T = 7

(-) 1 - 1.5

n = 8

(-) 2 - 3

T > 4 (Critical value of T at 0.05 level of significance)

(-) 3 - 4

(-) 4 - 5

(-) 5 - 7

(-) 5 - 7

(+) 5 - 7

Hypothesis II Rejected

^a The rank assigned to equal differences is the mean of the ranks that each of these differences would have occupied had the differences not been the same.

results of this study did not indicate a significant difference in the school-age child's perception of pain, as measured using the 10-centimeter scale, when a parent was present, as compared to when a parent was not present.

DISCUSSION

Interpretation of Findings

Based on statistical analysis of the results of this study, the investigator's hypotheses regarding an association between parental presence and pain perception in the school-age child cannot be accepted. Insights regarding the pain experience in the school-age child may be gained, however, by considering the qualitative observations made during the data collection process that did not directly relate to the research question.

Responses to the two data collection instruments varied among subjects, with levels of perceived pain decreasing when a parent was present in some subjects, remaining the same in other subjects, and increasing in one subject. This variance is consistent with the findings of Howe (1967), who obtained a variety of responses in an attempt to identify the school-age child's interpretation of and fantasies related to bandages and injuries concealed by bandages.

Vaughan and his associates (1979) are of the opinion that individualized reactions to separation from parents in school-age children are reflections of the differences in the children's past experiences. Similarly, Lollar, Smits and Patterson (1982), in developing a projective instrument to collect data on children's perceptions of pain, found that internal consistency was high in responses in psychosocial, recreational, and daily living areas, and lower in the medical area.

Differences were attributed to more diversity in experiences with medical pain. Schultz (1971) attributed variable responses from school-age children regarding the perceived meaning of pain to variable cognitive abilities present in this age group and beginning stages in the development of mature levels of thinking.

In Shaw and Routh's study (1982) involving pre-school children receiving immunizations, maternal presence was associated with negative behavior on the part of the subjects. In this study, though one subject did indicate that his level of perceived pain was higher with a parent present than without using both instruments, the investigator noted no negative behavior exhibited by any of the subjects, either with or without a parent present.

Though the child's ability to indicate that he is in pain cannot be objectively tested, because pain is a subjective and individual entity, the primary investigator noted that all 12 subjects colored areas on the body outline for the Eland Color Tool that corresponded to the surgical procedure they had undergone. In addition, several of the subjects also colored areas where intramuscular injections had recently been administered, and sites where venipunctures had been performed. These findings are consistent with those of Eland's pilot studies (1983a), and suggest to this investigator that the school-age child is able to accurately describe sensations of pain when the method provided for description (i.e., coloring) is familiar to him.

It is the opinion of the investigator that subjects described their levels of perceived pain with more confidence when using the

Eland Color Tool than when using the 10-centimeter scale. This was especially apparent with the younger children in the sample.

When interviewed pre-operatively, each subject was informed by the investigator that he could refuse to participate in a pain assessment interview at any time. Still, all subjects were cooperative and willing to participate in interviews with parents present as well as with parents not present, even though many indicated their level of pain to be high. In the opinion of the investigator, this suggests willingness on the part of the school-age patient to describe his pain to nursing personnel.

In questioning school-age children regarding reactions and perceived meanings of painful experiences, Schultz (1971) noted that male subjects most frequently identified contradictory responses to painful experiences, indicating bravery as well as fear. She attributed this finding to the conflict between meeting societal expectations and expressing actual feelings, as well as the emerging control of strong feelings at the school-age level. With respect to this study, only one subject, a seven-year-old boy, denied the presence of pain with and without a parent present, even though he had a suprapubic catheter in place, and was out of bed in a wheelchair for the first time post-operatively. This subject's parents stated that the child had a history of reluctance to complain of pain or request pain medications.

When orienting subjects to the use of the Eland Color Tool, a wide range of variance in colors selected to represent degrees of pain was noted. Four different colors were selected to represent

severe pain. Red was the most popular, chosen by half the subjects, while black was chosen by four subjects. The frequent selection of red to represent severe pain was consistent with the findings of a previous study (Savedra, et al., 1982; Savedra, et al., 1981; Tesler, et.al., 1981), in which hospitalized and non-hospitalized school-age children were questioned regarding perceptions of pain, causes of pain, and reactions to painful situations. These researchers identified red as the color most frequently selected to represent pain in general.

More variance was noted in colors selected to represent lesser degrees of pain. Subjects chose six different colors to represent moderate pain, six different colors to represent mild pain, and five different colors to represent no pain. Yellow was the color most frequently chosen to represent the absence of pain, selected by four subjects, while purple was selected by three subjects.

Several subjects indicated that the colors they selected represented concrete entities related to pain--red to represent blood, and black, as stated by one subject, "like black and blue." Relating abstract entities to physical reality at the school-age level is consistent with Piaget's description of the school-age child's intellectual functioning as being on the concrete operational level.

Finally, the investigator noted that on the days when the observations were made, "as needed" pain medications were only administered to five subjects while their parents were present, even though all but one of the subjects indicated to the primary investigator that they were in pain both with and without their parents present. Eland,

in associating parental presence with the frequency with which hospitalized children were given pain medications, found analgesic medications to be given less frequently when parents were present (1983a).

Limitations

The primary limitations of this study involve the sample. Convenience sampling, though necessary due to limitations in time and accessible population, results in a non-homogenous sample group, and threatens the external validity of the study. Since all subjects and parents agreed to participate in the study, "self-selection," in the opinion of the investigator, did not decrease the homogeneity of the sample. Requiring informed consents and assents may have, however, led to Hawthorne-effect type biases, that is, the fact that the subjects and parents were aware of their participation in a research study may have influenced their responses.

The small sample represents another threat to external validity, as well as a factor which may have hindered the attainment of significant conclusions. The inability to obtain a larger number of subjects meeting the investigator's criteria was attributed by the investigator to several factors. Preference toward performing elective surgical procedures on an outpatient basis, minimal time of post-operative hospitalization following many types of surgical procedures, numerous surgical admissions of patients not meeting the investigator's criteria for inclusion in the study (i.e., emergency surgeries, open heart surgeries, myelomeningocele patients), and physician preference that

specific patients not be included in the study all were seen as reducing the size of the accessible population.

As with any study conducted in a natural setting, extraneous variables may have affected the internal validity of this investigation. Specifically, the progression of time post-operatively, the time of day, the degree of activity in the environment, and lengths of the intervals since the subject's last meal and last period of sleep are all factors which could not be feasibly controlled, but must be considered as having possible yet immeasurable effects on the amount of pain experienced by the subject. Even though attempts were made to control for the effects of "as needed" pain medications, the interval of time between the child's last pain medication and the time of the observation must still be considered as having an effect on the child's pain level. In addition to "as needed" pain medications, several of the urology patients included in the study were receiving scheduled anti-spasmodic medications, which could have significantly affected the amount of pain that they were experiencing. Controlling the time of the interviews with respect to scheduled anti-spasmodic medications as well as "as needed" analgesic medications was not feasible.

Internal validity of the results obtained may also have been affected by the route of the child's prescribed pain medications. Eland (1977) notes that children often deny experiencing pain due to fear of receiving painful intramuscular injections for pain relief. The investigator explained to each subject that information given to the investigator would remain confidential and would not be shared

with members of the nursing or medical staff. Thus, a subject's disclosure to the investigator that he was experiencing pain should not have resulted in an intramuscular injection for pain relief. Still, it was possible that individual subjects remained fearful of receiving intramuscular injections, and did not accurately describe their levels of pain.

Differences in pain perception when parents are present, as opposed to when parents are not present, may be affected by a specific child's previous experience with hospitalization and surgery. Though internal validity would have been strengthened if controls were placed on these variables, due to limits in time and accessible population, such control was not feasible. Because all but one of the subjects had been previously hospitalized and all but two had undergone previous surgical procedures, even if significant results were obtained, they could not have been validly applied to school-age children who had not been previously hospitalized.

The fact that the Eland Color Tool has not been proven reliable statistically may also be considered as a limitation of the proposed study. Still, the tool does represent the state of the art in pain assessment instruments appropriate for use with pediatric patients. The investigator did note that subjects' reports of pain using the instrument were consistent with their areas of pathology, and no similar tools with statistically proven reliability are available.

Another factor to be considered is the possibility that individual subjects' responses on both instruments may not have been valid

indicators of the level of pain they were experiencing. Individual subjects may have responded in certain ways in order to obtain secondary gains, or to please the parent or the investigator.

Finally, this study was designed as an initial exploratory effort. Though insights into particular aspects of the problem area may have been gained as a result of this investigation, no conclusions may be made on the basis of this study alone, and further investigation is indicated.

Significance

Though the results of this investigation were inconclusive with regard to identifying a relationship between pain perception and parental presence in the school-age child, and limitations of the methodology prohibit generalization of the qualitative findings to the school-age population in general, it is the opinion of the primary investigator that the obtained insights into the pain experience in school-age children deserve consideration in planning nursing care for the school-age patient in pain.

Initially, levels of perceived pain indicated through the use of the two data collection instruments under both conditions, with and without the presence of a parent, varied among the subjects. Previous research involving school-age children's perceptions of and responses to painful situations also indicates variable responses among children of this age group. One may infer, then, that though no significant association between parental presence and pain perception

can be made for school-age children in general, variable relationships between the two factors may be present in different individual school-age children. It is important for the pediatric nurse to recognize the variability in experiences and cognitive levels in children of this age group, and how each individual child's response to a painful situation may be unique. Data obtained from a parent during an admission assessment and history should include not only a record of previous hospitalizations and surgeries, but information regarding how the child reacted in those situations, and the child's normal pattern of reaction to painful and stressful situations. Such baseline information is necessary in order for the nurse to assess a child's level of pain and ways of coping with that pain in a particular situation, and to plan individualized interventions directed toward pain relief.

Also, parent-child interactions and their effect on the child's comfort level should be assessed. Individualized education and support measures should be provided to parents in order to assist them in supporting their children.

Based on the response of subjects in this investigation to the data collection instruments, the investigator perceives that the school-age child is both able and willing to describe his perceptions of pain, especially if provided with familiar means for description. It is important for the nurse to elicit the child's own perceptions of his pain before planning pain relief interventions, rather than relying on objective observations. As indicated by Mc Caffery (1977), adaptation to a painful situation as well as fatigue may make

physiological and behavioral responses to pain less evident, even though the patient remains in pain. Conversely, Swafford and Allan (1968) note that behavioral signs which may be interpreted as indications of pain in children may instead be caused by other factors related to illness and hospitalization.

Variation in colors selected to represent different degrees of pain by the subjects was noted by the investigator. The investigator also noted that the subjects responded more confidently to the Eland Color Tool than to the 10-centimeter scale. This suggests that variable pain assessment instruments, such as the Eland Color Tool, which allow the child to construct his own pain scale, are preferable to instruments which provide the child with a fixed scale to represent levels of pain. The investigator noted that some subjects in the study selected the same colors to represent severe pain that were selected by other subjects to represent no pain. If a pain assessment scale is devised by the child himself, each level will be meaningful to that individual child, as opposed to fixed scales where indicators specified to represent certain degrees of pain may have different meanings to individual school-age children.

The frequency of stoic responses to painful situations in school-age children, especially boys, was noted in this and previous studies, and should be noted by pediatric nurses. Children who express no complaints of pain should be reassured that expressions of pain are appropriate and necessary in order to elicit nursing interventions aimed at pain relief. Role playing and play therapy may be effective ways

of communicating acceptable emotional responses to pain.

Responses to the Eland Color Tool where intramuscular injection sites were indicated to be as painful as surgical sites serve as further support for Eland's (1977) statement describing intramuscular injections as unacceptable pain relief measures for children. When intramuscular analgesics must be administered, the nurse should carefully prepare the patient, explaining that though the injection will hurt for an instant, it will result in relief of the patient's pain. When pain relief is achieved, the patient should be reminded that pain was relieved due to the intramuscular medication.

Finally, it was noted by the primary investigator that more than half the subjects, though admitting to being in pain, did not receive pain medications while a parent was present. Though some of these patients may have been offered pain medications and refused them, the nurse must not assume that since a parent is present, pain medication is not required. Again, the nurse should assess each situation individually and offer to provide pharmacological or non-pharmacological pain relief measures if necessary, even if a child's parents are present.

Recommendations for Additional Research

The area of pain in pediatric patients remains one where many questions are unanswered, and many problems are unsolved. Though this study did not result in conclusive findings and an answer to the research question, insights gained may serve as catalysts for future

research.

Modifications in the research design utilized by this investigator may lead to significant conclusions and increased generalizability of findings. Increasing the sample size, using additional data collection instruments, and making provisions for the inclusion of patients undergoing surgery on an outpatient basis are examples of possible modifications to the design.

The paucity of reliable pain assessment instruments appropriate for use with pediatric patients indicates a need for research aimed at verifying the reliability of available tools and developing new ones. Since the investigator noted that the children involved in the study described their pain more confidently when using the Eland Color Tool than when using the 10-centimeter scale, further reliability testing of the 10-centimeter scale with school-age children is indicated.

Parental presence is only one example of a variable in the patient's environment which may affect his pain perception. Many other such variables having potential effects on the pain experience in children may be studied.

A great need exists for the development of safe, effective pain relief measures for children that do not inflict additional pain, as alternatives to intramuscular injections. Nurses, pharmacists, and physicians should initiate studies to provide empirical evidence of the safety and effectiveness of other routes of administration for pediatric pain medications, such as intravenous drip narcotics, which, though utilized with great acceptance in a few institutions, are not

widely accepted by the majority of health care personnel. Research should also be directed at describing the effectiveness of specific pharmacologic and non-pharmacologic measures in relieving pain in children in specific age groups.

Being in a position to assess a child's level of pain, institute pain relief measures, and assess their effectiveness, the pediatric nurse is in an ideal position to identify problems associated with the pain experience in children and initiate research studies directed at solving these problems. Only through further research in the area of pain in children will the multitude of existing questions be answered and new interventions be developed to help pediatric patients reach an optimum level of comfort, and an optimum level of coping with unrelievable discomfort.

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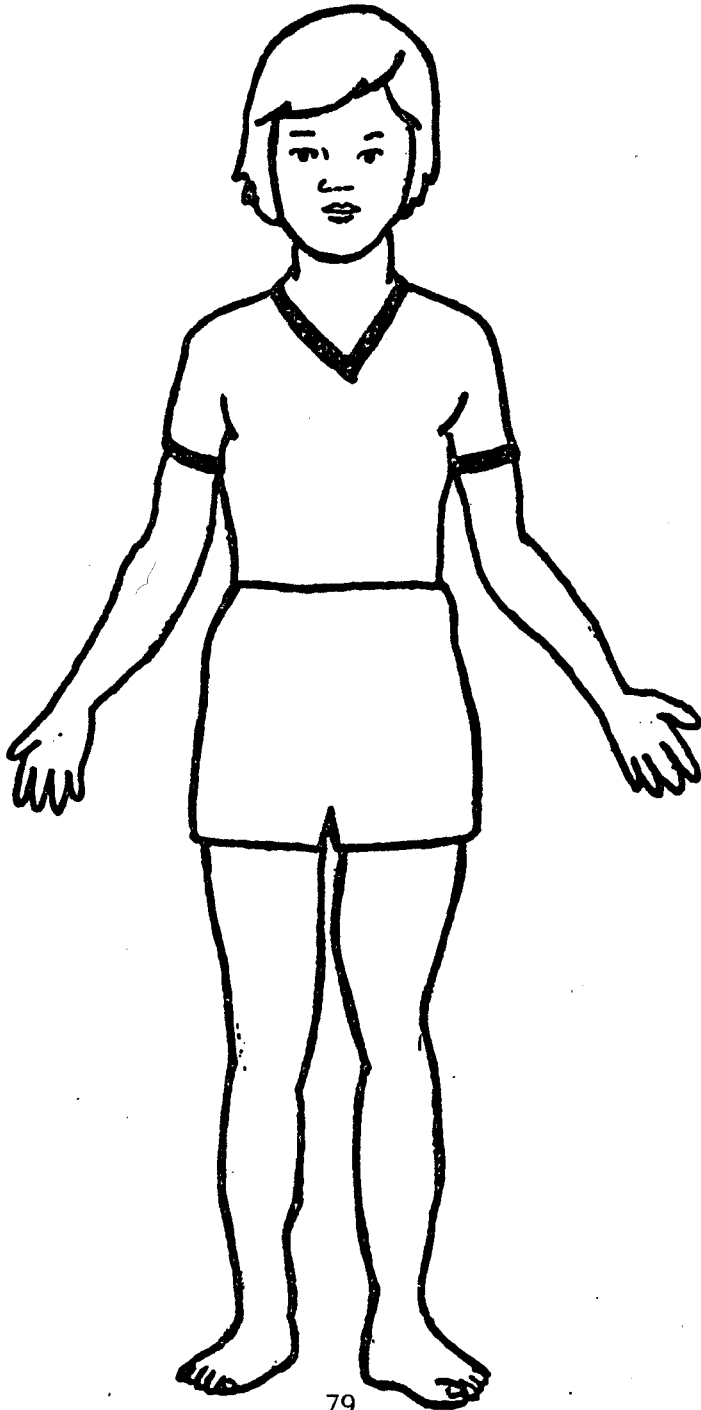
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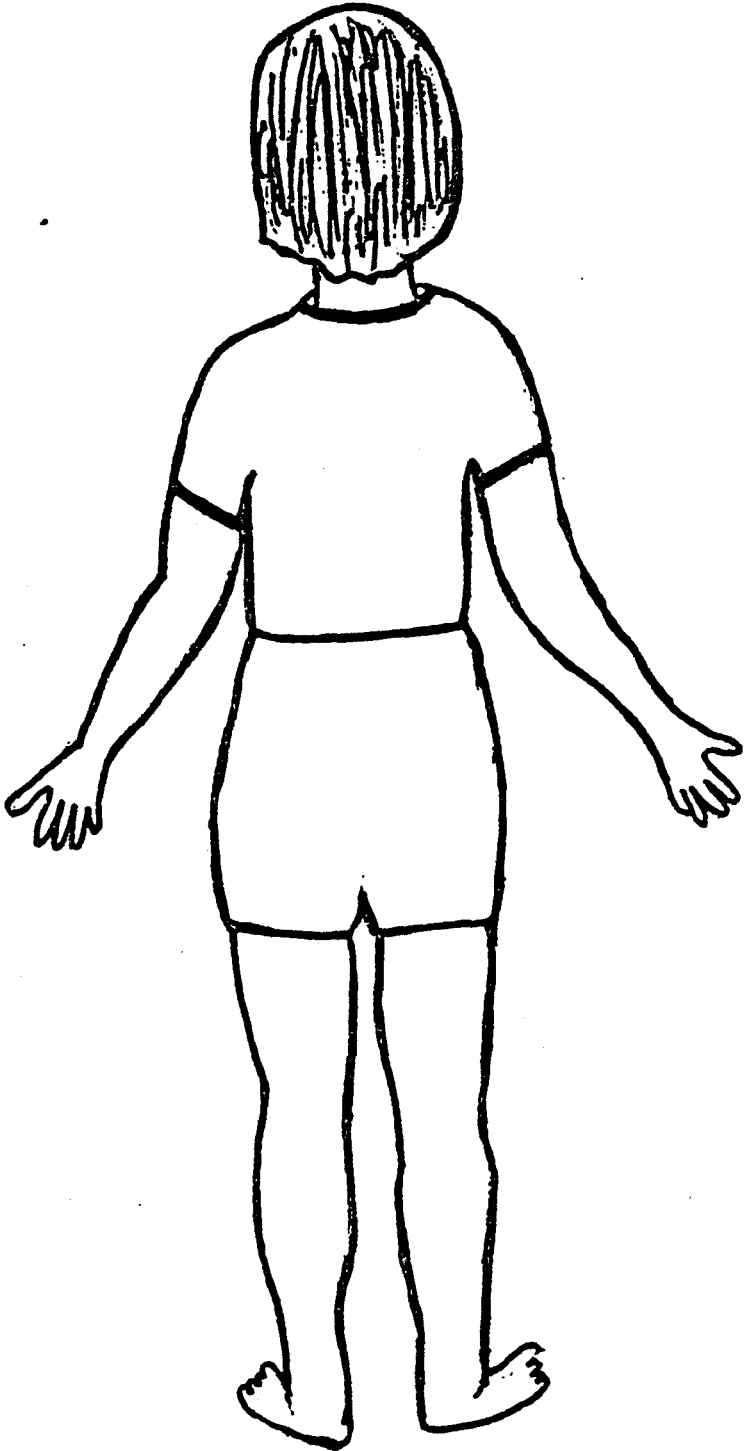
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APPENDIX A

APPENDIX A

Body Outline for the Eland Color Tool





(Used and reprinted with permission of J. M. Eland)

APPENDIX B

APPENDIX B

10-Centimeter Scale

I have
no pain.



I have
very bad pain.

APPENDIX C

APPENDIX C

Parental Informed Consent Form

Study Title

"Parental Presence and Pain Perception in the School-age Child"

Description of Study

Very little research has been previously conducted in the area of pain in children. Your child may benefit from this study by being provided with an opportunity to express his or her feelings about any pain he or she may be experiencing. The overall purpose of the study, however, is to further the body of knowledge regarding school-age children's perceptions of pain and factors that affect these perceptions. By gaining knowledge in this area, it is hoped that nurses will learn to increase comfort levels in children whose medical conditions result in pain.

Your child will be interviewed by the principal investigator, a pediatric nurse and graduate nursing student at Loyola University of Chicago, twice during the first day following his or her surgery. He or she will be asked if he or she is experiencing any pain, and then asked to describe that pain using two simple tools which have been designed for the assessment of pain in children, and will be explained to you and your child. One of the interviews will occur while you are present, and one while you are not present. No risks to

participation in the study have been identified, except for the slight inconvenience of answering the investigator's questions and completing the pain assessment tools. Each interview will take approximately 15 minutes to one-half hour. Your child will not be awakened from sleep for either interview. You or your child may refuse an interview at any time. In all reports of this study, results will be described collectively. Your identity and that of your child will be known only to the principal investigator. In the event that your child should be injured in the course of this study, you will be provided with necessary medical care in State University Hospital. However, this statement does not mean that either such medical care or hospitalization, if necessary, will be free of charge. Furthermore, we cannot provide you with compensation as a result of any injury.

I, the parent or guardian of _____, a minor _____ years of age, consent to his/her participation in a research study conducted by Sandra Baran Englert, R.N., B.S.N. I understand that no risk is involved and that I may withdraw my child's participation at any time without prejudice to his/her medical or nursing care. I have received a copy of this informed consent form.

Signature of Parent

Witness to Signatures

Sandra Baran Englert
Principal Investigator

Date

APPENDIX D

APPENDIX D

Subject Assent Form

I, _____, say that it is OK for me to help Sandy Englert, a nurse who works with children, learn more about children who might have pain or "hurts". Sandy has told me that she will visit me two times after my operation, and ask me if anything hurts. All that I have to do is tell her if anything hurts and if it hurts a lot or a little, and color the spots that hurt on a picture of a boy or girl. One of the times when Sandy visits me, my mom or dad will be there too. The other time, they won't be in the room. My mom or dad say that it is OK for me to help Sandy, but if I don't want, Sandy has told me that it's OK to say "no" anytime that I want to.

Signed _____

Witnessed by parent _____

Investigator _____

Date _____

APPENDIX E

APPENDIX E

Participant Data Form

Name of Child _____

Age _____ Sex _____ Grade in School _____

Child lives with: (circle appropriate response)

Mother Father Both Parents Other

If Other, please specify: _____

Number of Siblings _____

Sibling Information:	<u>Sex</u>	<u>Age</u>
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____
	_____	_____

Child's Previous Hospitalizations:

<u>Approximate Date</u>	<u>Reason</u>	<u>Approximate Duration</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Child's Previous Surgeries:

Approximate Date

Reason for Surgery

Words child uses to describe pain (i.e., "ouch," "hurt," "owie"):

APPROVAL SHEET

The thesis submitted by Sandra Baran Englert has been read and approved by the following committee:

Dr. Linda Janusek, Director
Associate Professor, Nursing, Loyola

Dr. Elizabeth B. Brophy
Associate Professor, Nursing, Loyola

Dr. Dona J. Snyder
Associate Professor, Nursing, Loyola

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Master of Science in Nursing.

12-3-84
Date

Linda Janusek
Director's Signature