

**THE HEALING EFFECTS OF ART IN PEDIATRIC  
HEALTHCARE: ART PREFERENCES OF HEALTHY CHILDREN  
AND HOSPITALIZED CHILDREN**

A Dissertation

by

SARAJANE L. EISEN

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2006

Major Subject: Architecture

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## ABSTRACT

The Healing Effects of Art in Pediatric Healthcare:  
Art Preferences of Healthy Children and Hospitalized Children.

(May 2006)

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Art is assumed to possess therapeutic benefits of healing for children, as part of patient-focused design in healthcare. Research on adult patients suggests that by infusing art into the healthcare setting, the design may reduce stress that could impede the healing process. Since the psychological and physiological well-being of children in healthcare settings is extremely important in contributing to the healing process, it is vitally important to identify what type of art supports stress reduction. Nature art was anticipated to be the most preferred and have stress-reducing effects on pediatric patients.

The objective of this study was to investigate what type of art children prefer, and what type of art has potentially stress-reducing effects on pediatric patients. This study used a three-phase, multimethod approach: a focus group study, a randomized study, and a quasi-experimental study design. Findings from three phases were

evaluated. The objective of Phase 1 was to discern what type of art school children prefer, Phase 2 focused on what type of art hospitalized children prefer and to compare these preferences identified in Phase 1. Phase 3 was a quasi-experimental study to determine if nature art has a potentially healing effect on pediatric patients when compared to abstract art or no art at all.

The findings of this study demonstrate that nature art is the preferred type of art by children from age 5 to 17. But there were no significant differences among the three art intervention groups of pediatric patients. These findings led to design recommendations regarding what art should be placed in children's hospital rooms in order to create a stress-reducing, healing environment.

## **DEDICATION**

To the two greatest joys of my life, my daughter, Evan,  
and my son, Tyler

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## CHAPTER I

### INTRODUCTION AND LITERATURE REVIEW

#### 1.1 INTRODUCTION

Art is widely assumed to possess therapeutic benefits of healing for children, as part of patient-focused design in healthcare, based on adult study results (Ulrich, 1992). *Healing* refers to a condition of optimal well-being, with soundness of body or mind, or freedom from ill health (Merriam-Webster Online Dictionary, 2005). Since the psychological and physiological well being of children in healthcare settings is extremely important in contributing to the healing process, it is vitally important to identify elements in the environment that support stress reduction in children. Because art potentially possesses such therapeutic benefits of healing, it is important to understand what type of art children prefer and what contributes to healing. Children may benefit both psychologically and physiologically if art is infused into the healthcare setting. Research on adult patients suggests that by infusing art into the healthcare setting, patient-focused design may foster improved moods or reduce stress that would impact the negative thoughts that could impede the healing process (Ulrich, 1979, 1984, Ulrich, Simons, Losito, Fiorito, Miles, & Zelson, 1991, Ulrich, Lunden, & Eltinge, 1993). The results can be positive

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This dissertation follows the style of *Journal of Pediatric Psychology*.

psycho-physiological effects and improved medical outcomes for patients exposed to art (Ulrich, 1992, Ulrich & Gilpin, 2002). Most healthcare interiors are designed with a theme, referred to as theme-ing. *Theme-ing* is defined as using a theme to define an art program rather than addressing the full range of developmental and psychological implications of the visual image (Shepley, 2000). But is this actually what children prefer and what helps them heal?

## 1.2 ENVIRONMENTAL FACTORS AFFECT STRESS

The designed environment can affect hospitalized patients' behavior and can elicit responses that contribute to stress or serves as mitigators. One way to understand the relationship between the environment and human behavior is to analyze environmental conditions that can interfere with optimal human functioning (Evans & Cohen, 1987). Physical environments have characteristics that can influence whether or not stress is produced. *Stress* is an important concept in understanding the interaction between individuals and the environment (Ulrich, 1996). Specifically, how the presence of art in the built environment in healthcare can influence patients' psychological well-being is the focus of this study, with specific focus on art and children.

The effect of stress on health has attracted considerable attention from researchers, healthcare providers, and designers. Although most of the research deals exclusively with adults, there is growing evidence that children experience stress as well and that their health is adversely affected by it (Dise-Lewis, 1988; Varni, Setoguchi, Rappoport, & Talbot, 1991, Varni & Katz, 1997). Children in hospitals are faced with many

psychological challenges. Often their freedom is restricted: trust between parent and child is violated; painful procedures and the difficulties of recuperation are encountered – all in unfamiliar settings. Limited cognitive development may limit the array of internal coping skills available to these children to cope with such stresses (Oksala & Merenmies, 1989). Thus the potential importance of external environmental factors in lowering the effects of hospital-related anxiety may be increased.

The notion that the physical environment can impact the healthcare experience is not a new one. Florence Nightingale (1969) in her 1859 publication, *Notes on Nursing*, commented on several environmental issues, including light, noise, plants, windows, color, and furnishings. Until very recently, in spite of Nightingale's reflections, hospitals continued to be functionally designed rather than patient-focused. During the early 1900s hospital design was driven by changing medical practices and treatment and by ever-changing requirements to accommodate new medical technologies (Hosburgh, 1995). By including patients' needs in the design process, healthcare designers and providers have revealed a conscious concern for patient needs. Despite the lack of research, many design and healthcare professionals believe that aesthetically pleasing decor and artwork can enhance the patient experience (Harris, McBride, Ross, & Curtis, 2002).

Much research shows that well-designed, patient-focused environments can help to reduce stress. According to Ulrich (1992) representational, nature art has beneficial effects in a number of healthcare settings on adults experiencing stress and anxiety. It is

probable that children should be affected in similar ways. Ulrich found most persons prefer representational, nature art that is unambiguously positive and tension-free, rather than expressionistic or semi-abstract. The majority of research in this area has been conducted with photographs and slides rather than with site exposure to nature (Kaplan & Kaplan, 1989). If photographs and slides of nature are viewed positively and reduce stress, it is probable that artwork that replicates nature would also have this effect.

Underlying patterns of relationships can explain an individual's behavior and generalize the behavior to the greater population (Gardner, 1982). Thus research should attempt to find a potentially common underlying pattern, if possible, that is universal to most children within a specified developmental age range, specifically with regard to their responses to specific types of art. According to Susan Langer, to know anything about a subject is to know how it is related to its surroundings (Gardner, 1982). In Langer's view, children's responses to art stem from a collection of mental images that have accumulated through their developmental years of exposure to various environmental stimuli. Langer found that memorable experiences are filtered through one's imagination. Such knowledge is crucial to the understanding of how children respond to their environment and the art it contains.

In a study on children's human needs in intensive care (Oksala & Merenmies, 1989), results reflected the need for health caregivers to focus on the individual needs of children, not those strictly advocated by parents. In this study of 30 children admitted for intensive care after heart surgery, a questionnaire was administered. Children rated their emotions based on aesthetic responses to their healthcare environment. Results

suggested children's need for aesthetic experiences and that their sensory integration increased toward the end of the intensive care stay. This study emphasizes the importance of understanding children's needs as a basis for providing and planning pediatric facilities that meet both human and environmental requirements for children's well-being (Sherman, Shepley, & Varni, 2005a).

Although many studies support such effective design of the interior built environment in healthcare settings, the vast majority of studies in intensive care settings focus on parent preferences and needs and are anecdotal, not science-based (Meyer, 1998). While many children's hospitals provide child-friendly environments and psychological preparation for their procedures, there is a need for patient-validated expression of preferences of children. Present design of interior healthcare environments focuses on what adults think children prefer. It is highly questionable whether adult-designed research instruments for children's studies provide valid information from a child's perspective. This approach to using adult-designed research instruments to evaluate children has been an impediment to understanding children. Children respond to various environmental stressors differently from adults (Sherman, Shepley & Varni, 2005b).

Interior healthcare environments that provide psychological support through design elements such as art provide for emotional self-regulation, which affects patients' ability to cope with stress. Studies of children's and adults' favorite-places provide empirical support regarding the important role of self-regulation as the underlying dynamic in favorite-place preferences and experiences. The concept of

environmental self-regulation holds that the environment can become an essential part of regulating the experience of self and emotion (Korpela, 1989). According to Korpela, place preference and restorative outcomes are interrelated within self and emotion regulation. For example, an adolescent entering a favorite place can produce an illusion of the place with humanlike nurturing qualities that strengthen positive feelings and lower negative ones. The feeling of *being away* from stresses, providing relaxation and calmness, is compatible with the place accompanied by feelings of *sense of control*, which affects psychological well-being and restoration. It can serve much the same purpose in helping children and can serve as a restorative element, providing that sense of “being away” from stresses (Sherman, Shepley & Varni, 2005b).

### **1.3 LITERATURE REVIEW**

#### **1.3.1 Impact of the Designed Environment on Patient Stress**

The designed environment which has the potential to affect individuals' psychological and physiological interactions that affect their behavioral processes, which elicit responses – positively or negatively affecting stress levels in patients - has long been recognized by environmental psychologists and architects (Altman & Low, 1975). The physical environment has characteristics that can influence whether or not stress is induced. Understanding specifically how the built environment in healthcare can influence the design of environments is critical to generating designs that support patients' well-being.

Stress is a result of a misfit between individual needs and environmental attributes (Evans & Cohen, 1987). Stress refers to the process of responding to situations that are demanding, over-stimulating, or threatening to well-being. The hospital is a sensory-deprivation and overload area, and a patient's ability to handle stress has already been impaired by illness or the effects of surgery (Tse, Ng, Chung, & Wong, 2002). In healthcare settings, stress is an important factor because of its ability to significantly affect medical outcomes through physiological reactions such as increased heart rate and increased blood pressure (Ulrich, 1992). Through elevation in these areas, stress hormones are released and immune functions are inhibited (Evans & Cohen, 1987). Physiological stress centers on the sympathetic nervous system and the pituitary-adrenocortical axis (refer to Table 1.1). Each of these systems responds to aversive factors called *stressors*, with the body responding with its emergency response system that allows the individual to "fight or flee" from any seriously challenging or threatening situation (Evans & Cohen, 1987).

**Table 1.1.** Patient stress: psychophysiological effects

1. Psychologically: Stress is manifested as a sense of helplessness, generating anxiety and depression.
2. Physiologically: Stress causes change in bodily systems, through changes in blood pressure, respiratory and heart rate or high levels of circulating stress hormones, all of which can reduce functioning of the immune system.
3. Behaviorally: stress can generate a variety of reactions adversely affecting wellness, including verbal outbursts social withdrawal, sleeplessness, alcohol abuse, and noncompliance with medication. (Ulrich, 1992).

### 1.3.2 Relevance of Stress to Understanding Healthcare Environments

The individual perception of environmental demands and personal coping resources are the critical variables in determining the stress response. Important environmental mediators can mitigate or aggravate stress (Evans & Cohen, 1987). Individuals' responses to stress are linked to pre-existing psychological and physical conditions, which may weaken the response system and resiliency to coping. In a study of pain perception of subjects ages 5 to 16, higher patient-perceived pain intensity was associated with higher state and trait anxiety, depressive symptoms, lower self-esteem, and higher internalizing and externalizing behavior problems (Varni, Rapoff, Waldron, Gragg, Bernstein, & Lindsley, 1996a). Anxiety is known to increase subjective complaints of pain (Tse, Ng, Chung, & Wong, 2002). A priority of pediatric nursing interventions is alleviation of stress as a result of fear and anxiety (Hart & Bossert, 1994). Understanding the origin of the fears of these hospitalized children would help determine effective mitigators.

What can contribute to lowering these fears, thus presumably alleviating stress? A healthy hospital facility is one that contributes to the health of its users by physical design providing environmental elements can reduce stress and enhance the quality of life (Shepley, Fournier, & McDougal, 1998). In a review of literature on the effects of the built environment on patients' medical outcomes revealed that the design of the healthcare environment might have an effect on the users (Ruben, Owens, & Golden, 1998). This research report concluded that scientific research investigations might validate the implementation of improvements through appropriate, research-based

design interventions. However, few of these studies have included pediatric patients (Sherman, Shepley & Varni, 2005b).

## **1.4 THEORIES PERTINENT TO PAIN AND STRESS REDUCTION**

### **1.4.1 Positive Distraction Theory**

Children often use distraction as a coping mechanism to divert attention away from stressful stimuli. Distraction is defined as a “sensory shielding,” where the patient is shielded from the sensation of pain by increased sensory input from other sources (Dise-Lewis, 1988). By focusing attention on stimuli other than pain, pain perception becomes a peripheral sensation (Dise-Lewis, 1988). Positive distractions are certain types of environmental features that have been shown through research to successfully reduce stress and promote wellness. A positive distraction is an environmental feature that elicits positive feelings and hold attention without taxing or stressing the individual, thereby blocking worrisome thoughts (Ulrich, Simons, Losito, Fiorito, Miles, & Zelson 1991). Pain research with pediatric patients with arthritis and hemophilia has demonstrated how guided imagery of nature scenes can reduce pain perception (Varni, 1992; Varni, Gilbert, & Dietrich, 1981; Walco, Varni, & Ilowite, 1992). Research on children’s understanding of emotion has shown that young children promptly identify scenarios that elicit certain emotions such as fear, happiness, and sadness (Harris, 1983, 1985). Distraction is an effective cognitive-behavioral technique to help children cope.

### 1.4.2 Visual Distractors

According to Lazarus and Folkman (1984), individuals turn to emotion-focused coping when they perceive that nothing can be done to change the threatening situation. The goal is to remove negative thoughts from conscious awareness, creating cognitive comfort and reducing stress. Pain was defined as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage” (International Association for the Study of Pain, 1979, p. 248). Many intrapsychic nonpharmacologic approaches are ineffective with children due to their immature cognitive processes (Hurley & Whelan, 1988). Young children do not have the concentration skills required to use distraction techniques such as imagery. Therefore, children’s age, developmental level, and prior experiences must be considered when selecting specific distraction techniques for pain intervention (Broome, Lillis, McGahee, & Bates, 1992). A kaleidoscope used as a visual distractor was found to significantly reduce venipuncture pain in a sample of 100 children ages 3 to 12 years (Vessey, Carlson, & McGill, 1994).

Another distraction tool recently found to be effective is immersive virtual reality (VR). The advantage of VR is the sense of total sensory immersion in an environment. One study involving children receiving treatment for burns found these patients to have reduced anxiety and less pain with a VR distractor (Hoffman, Doctor, & Peterson, 2000).

In another study, conducted by Schneider and Workman (1999), with 12 children ages 10 to 17, who were undergoing chemotherapy treatment used VR as a distraction intervention to mitigate chemotherapy-related symptoms. Prior to treatment, the emotional state of cancer patients was measured through the use of the Symptom

Distress Scale (SDS). During chemotherapy treatment, subjects wore a VR headset connected to a personal computer and were able to select from three virtual reality scenarios: Magic Carpet, Sherlock Holmes Mystery, and Seventh Guest (a haunted mansion) on commercially available CD-ROM. The subjects used the VR equipment throughout the treatment. The study results revealed that symptom distress was significantly lower immediately following a chemotherapy treatment during which subjects used a VR distraction intervention. Hinds and Martin (1988) proposed that adolescents with cancer progress in a sequential self-sustaining process of coping. An important component of the self-sustaining process is distraction that promotes positive thought. After experiencing such positive distraction, patients move through phases of cognitive comfort and then personal competence. Personal competence occurs when adolescents perceive themselves as resilient in the face of serious health challenges (Schneider & Workman, 1999). Thus, positive distraction has been shown to meet the requirement for an emotion-based coping strategy, which supports patients in coping with painful medical procedures.

### **1.4.3 Gate-Control Theory**

Sparks (2001) advocates the use of cognitive-distraction to alter pain perception based on the conceptual framework of the *gate-control theory* of pain. According to this theory, peripheral nerve impulses including pain are sent to the brain. These are transmitted to the central nervous system through several spinal cord systems, which include the substantia gelatinosa (SG) in the dorsal horn. Through the interaction of

these systems, pain is experienced, with the SG acting as a control or gate system that modulates the transmission of nerve impulses (Sparks, 2001). Emotional and cognitive impulses alter pain perception through descending fibers to the gate system, which can be closed or opened.

Two forms of distraction were tested for comparative effectiveness for 105 preschool children who experienced injection pain. The study compared the effects of touch and bubble blowing on children receiving DTP immunization injections. Children ages 4 to 6 were randomly assigned to one of the three groups. Group 1 received bubble blowing as a distractor during the injection; group 2 received touch as a distractor during the injection; and group 3 received customary care. Findings from this study indicated that both forms of distraction resulted in significantly reduced pain perception versus customary care (Sparks, 2001). Therefore, cognitive activities, such as distraction can close the gate and prevent transmission of pain (Melzack & Wall, 1965), assisting in refocusing attention on stimuli other than the pain (McCaffery & Beebe, 1989; Pederson, 1995). Positive distraction can serve as an effective intervention, allowing the patient to focus on pleasing or interesting stimuli rather than their unpleasant symptoms (Varni, Gilbert, & Dietrich, 1981; Hockenberry & Bologna-Vaughan, 1985; Walco, Varni, & Illowite, 1992).

## **1.5 COGNITIVE DEVELOPMENT: IMPLICATIONS FOR ART STUDY**

### **1.5.1 Piaget's Theory of Cognitive Development**

Theorists have suggested that children are incapable of understanding certain aspects of the world until they reach a particular stage of cognitive development.

Cognitive development is a process whereby a child's understanding of the world changes as a function of age and experience (Gallagher & Reid, 1981). So understanding cognitive development is important to understanding how children respond to their environment, in order for the designed environment to support children psychologically and physically as they progress through various developmental stages.

Children develop through an intellectual regulatory process geared to adaptation to the environment. During their ongoing relationship with the environment, children assimilate new experiences, fitting the information into existing schemas and then generating accommodations to fit the new environment (Gallagher & Reid, 1981). Theories of child development, such as Piaget's theory of cognitive development seek to explain the quantitative and qualitative intellectual abilities that occur during development (Gallagher & Reid, 1981).

No theory of cognitive development has had more impact than that of Jean Piaget, a Swiss psychologist that suggested that children move through four separate developmental stages in a fixed order that is universal for all children. These stages differ in the quantity of information acquired at each, and also in the quality of knowledge and understanding at each stage. Piaget suggested that movement from one stage to the next occurred when the child reached an appropriate level of maturation and

was exposed to relevant types of experiences. Without experience, children were assumed incapable of reaching their highest cognitive ability. Piaget's four stages of cognitive development are *sensomotor* (infancy: 0-2 years), *preoperational* (toddler/early childhood: 3-7 years), *concrete operational* (elementary/early adolescence: 8-11 years), and *formal operational* (adolescence/adulthood: 12-18+ years) (Brainerd, 1978).

The *sensomotor* stage in a child is from birth to 2 years of age. During this stage, a child has relatively little competence in representing the environment using language, images, or symbols. An infant has no awareness of people or objects that are not present at a given moment, referred to as "lack of object permanence." According to Piaget, the person or object that has visually disappeared is gone forever to the infant (Brainerd, 1978).

The *preoperational* stage is from the age of 3 to 7 years of age. The most important development at this time is language. Children develop an internal representation of the world that allows them to describe people, events, and feelings. They use symbols along with their imagination to express thoughts and feelings. Piaget characterizes children in this preoperational stage as having egocentric thoughts (Brainerd, 1978). The world is viewed entirely from the child's own perspective. Children are unable to distinguish fantasy from reality. They think in magical terms, not according to logic. What the child can see and manipulate concretely is their experience. Concrete examples have more meaning than generalizations or intangible explanations. So a child's explanation to an adult can be very unclear and

uninformative. Children in the preoperational stage lack an understanding of the principle of *conservation*. This is the knowledge that quantity is unrelated to the arrangement and physical appearance of objects. Children who have not passed this stage do not know that the amount, volume, or length of an object does not change when the shape is altered. Piaget declared that this is not mastered until the next developmental stage (Gallagher & Reid, 1981).

The *concrete operational* stage lasts from age 8 to 11 years. Children develop the ability to think in a more logical, systematic manner, overcoming some of the egocentric characteristics of the preoperational period. One of the major concepts learned in this stage is the idea of *reversibility*. This is the idea that some changes can be undone by reversing an earlier action, like a ball of clay can be rolled into an elongated shape or back into a ball form. Children in the concrete operational stage have a greater understanding of time and space. They have limited understanding of abstract thinking, according to Piaget (1930).

The *formal operational* stage begins for most at 12 or 13 years of age and continues into adulthood. This stage produces a new kind of thinking that is abstract, formal, and logical. Thinking is no longer tied to events that can be observed. A child at this stage can think hypothetically and use logic to solve problems. There are several structures that are developed in this stage: hypothetico-deductive reasoning, scientific-inductive reasoning, and reflective abstraction. Piaget described the capacity for hypothetico-deductive reasoning as the ability to be able to deal with not only objects and experiences but hypotheses as well, with the possible as well as the real. This

highlights the individual's ability to make conclusions by going from general to specific: deductive reasoning (Gallagher & Reid, 1981).

Scientific-inductive reasoning is the ability to think like a scientist, to make conclusions by going from specific observations to generalizations. When individuals at this stage have been confronted by a problem, they can think about it abstractly and can think over each of the variables and how they would affect the situation while systematically testing for these (Wadsworth, 1978). Another structure that develops during this stage is *reflective abstraction*. This is a mechanism by which knowledge is gained through internal thought or reflection based on available knowledge (Wadsworth, 1978). An analogy is an example of reflective abstraction. Analogies are about constructing relationships between objects.

From this point on, improvements in intellectual ability are based on gaining knowledge, experience, and wisdom, rather than on gains in basic cognitive capacity. It is thought that not all individuals reach this level of scientific-inductive thinking. Most studies show that only 40% to 50% of American college students and adults fully achieve it. In developing countries where technology is not as advanced as in the United States, almost no one reaches the formal operational stage (Brainerd, 1978).

Children develop cognitively from the *sensomotor stage* of using symbols and symbolic understanding to imagination in a non-logical manner during the *preoperational stage*, to logical understanding of concrete objects during the *concrete operational stage*. In the *formal operational stage*, intelligence is demonstrated through understanding of abstract concepts (Brainerd, 1978).

### **1.5.2 Cognitive Development and Pain Perception**

Physicians' and nurses' understanding of children's perception and response to pain based on their cognitive development stage is very important if they are to provide stage-appropriate care. Understanding of stage-appropriate responses could reduce stress levels in children by improving communication among nurses, children, and parents. This decreased stress could result in children's increased compliance for medical care and overall health outcomes.

Piaget (1930) described the incremental cognitive developmental stages as they relate to children's perception of pain, its origin, meaning and response. Preoperational children respond to pain in egocentric ways, such as "my own," without an understanding of origin. Concrete-operational children are apt to provide more information about their experiences with pain, with some understanding of cause and effect. There is evidence of understanding regarding psychological pain, if only at the level of conveyance of hurt feelings. Children at the formal-operational level are more abstract in their thinking, relating to pain experienced by others and comprehending some relationship between the mind and body experiences (Piaget, 1930).

From a study conducted by Hurley and Whelan (1988) examining the responses of children according to Piaget's stages of cognitive development, patterns of pain cognition surfaced. Interviews were conducted with 48 schoolchildren from first through eighth grades to determine their perceptions of pain based on Piaget's cognitive levels of development. The study results reported subjective experiences of pain supported by the four stages of development with respect to Piaget's defined levels

cognitive functioning: sensomotor, preoperational, concrete operational, and formal operational stages (Hurley & Whelan, 1988). Based on the children's responses to 10 survey questions, the changes in maturation of thinking became apparent. Patterns reflective of specific stages emerged from the analysis of these children's responses. Preoperational children related to pain primarily as a physical occurrence, holding someone else responsible for their pain. Children at this stage of cognitive development function on a present mode of thinking, or relating "in the moment" (Hurley & Whelan, 1988). Concrete-operational children related to pain physically and could identify where the pain was located. Since this is a level of concrete thinking, children relate to tangible concepts such as their body and worry about what might harm them. Formal-operational children were able to problem-solve in a manner more reflective of adult thought processing, but without life experiences that might contribute to mature responses (Hurley & Whelan, 1988). Other developmental studies have been conducted on children's cognitive developmental levels related to aspects of physical and psychological well-being (Eiser, 1985; Koocher, 1973). The data strongly support a systematic evolution of the concepts of illness consistent with Piaget's theory of cognitive development.

## 1.6 FAVORITE REMEMBERED PLACES

### 1.6.1 Children's Environmental Memories

Because few studies on art and children have been conducted, reviewing studies of children's preferences for environment will provide information as to children's preferences. In her research Sebba (1991), found that children's relationships to their environment are studied from actual and retrospective points of view.

Childhood memories are incorporated as "inner landscapes" into their memory and are called upon in adulthood. Questions such as What is the character of these inner landscapes? And What can we learn about ourselves or the landscapes that encompass our past? can help the researcher understand the impact and significance of place upon children. *Place preference* refers to children's desirable favorite or unpleasant places in everyday surroundings (Korpela, 2002). Early childhood relations with outer landscapes seem to affect how one perceives, values, and structures their view of their immediate world or environment.

Sebba (1991) studied children's and adults' preferences of favorite place remembered, with 96 architecture students (ages 21-30) and 102 teachers, school principals, and nursery school teachers (ages 25-50). The question posed to adults was: Which place was the most significant for you in your childhood? Architecture students responded with oral and written descriptions. The teachers provided written descriptions. Responses were based on physical descriptions of the environment, which were active factors in the childhood experience. Places described were not necessarily

were present. The prevailing explanations given by adults for their choice were: “There I see myself as a child” or “There I was really a child.” The outdoors was indicated as the most significant environment in their childhood by 95.6% both male and female (Sebba, 1991).

For children, the question posed was What is your favorite place? One hundred seventy-four children (ages 8-11) participated in the study. Children’s preferences were gender-related, with boys preferring the outdoors and girls preferring indoor locations. Girls’ indoor place preference could be based on increased preference for social interaction from 8 to 11 years of age, due to developmental differences between boys and girls.

### 1.6.2 Adult Childhood Environmental Memories

According to Sebba’s study on childhood environmental preferences, when adults were questioned about reasons for their preferences, participants related to their perpetual sensory experience. They described feelings of water, light, rolling in grass, clouds and trees, feelings of height, viewing treetops. Such stimuli made them listen to themselves, engaging their bodies in absorbing sensations. Children showed preferences based on similar interactions with their environment. Research results indicated that the part of the environment that awakens the senses also stimulates the imagination in the natural environment. The manmade environment, or “hardscapes” does not encourage sensory response. Sensory integration with the environment develops within the child until their 10th year of development (Sebba, 1991).

Ayres (1979) claims that within every child, there is a great inner drive to develop sensory integration, with the third through seventh years being most critical.

The active interaction of children with their surroundings provides them with developmental information and memorable connections. Memories of this kind are one aspect of environmental autobiography, or the recounting of important places in one's life (Chawla, 1990), generally analyzed by Cooper Marcus (1978) with adults' reflections of favorite remembered childhood landscapes and the psychological effects in adulthood. "In these memories the child appears to experience both a sense of discontinuity, as awareness of his own separateness and identity, and also a continuity, a renewal of relationship with nature as process." (Cobb, 1959, p. 539). This conclusion traces a line of influence that children's nature encounters profoundly affect their thought as adults.

In an analysis of 38 autobiographies by men and women collected to represent three broad categories of professions, the arts and humanities, the sciences, and the law, journalism, and politics, Chawla (1990) analyzed the different forms of environmental memory that emerged that expressed "ecstatic places." The environment itself offered freedom in the sense of potentiality – openness to exploration and discovery. In most cases this quality belonged to the natural environment: gardens, the seashore, a lake, prairie land, fields, and forests. Ecstatic places, is defined as "a state of intense, overwhelming emotion," (*Webster's encyclopedic dictionary of the English language*, 1975), often in contemporary terms referred to as "delight" (Chawla, 1990). These ecstatic places were usually outdoors, with a ratio of four to one compared to indoor

places. They were places where one had felt comfortable, secure, and well loved...open space that the child could move through untiringly. Not only was there association with the physical freedom of multisensory discovery, ecstatic memories were always marked by psychological freedom of undisturbed discoveries (Chawla, 1990).

Spender (1951, p. 311) expressed the exceptional harmony of his childhood setting "It enabled me to retain throughout a life a central calm and happiness, amid violent divisions of my own nature." Thurman (1979, p. 7) expressed his sense of integration of nature and human life, indicating that this integration was the foundation for a solid footing in life, creating a barrier against future painful experiences. According to Chawla (1990), the legacies of ecstatic memories are meaningful images, an internalized core of calm, and a sense of integration with nature.

### **1.6.3 Artistic Style Preferences**

Artistic style is a factor influencing children's picture preferences, according to Ramsey (1982). Several studies find that elementary school children prefer realism to abstract art images. In a study with 255 first-, second-, and third-grade students, pictures were shown to each child representing an example of each art style: photographic realism, representational, cartoon, and expressionism with animal content. The results of the investigation revealed that artistic style influences children's picture preferences, as pictures related to book selection. Photographic realism and cartoon styles were highly rated, while representational and expressionistic styles were less preferred. A preference for realism has long been noted in the literature (Ramsey, 1982).

In contrast, Parsons (1987) claimed that young children rarely find fault with painting no matter what the subject or style. Additionally he asserts that from age 4, children continue to develop through decidedly predictable stages of aesthetic preference.

In Parson's Stage 1: Favoritism, children, ages 4 to 7, find subject matter irrelevant and prefer abstract as well as realistic painting styles. At this stage, children also prefer bright colors. In Stage 2: Beauty and Realism, for children ages 7 to 10, subject matter becomes very important. Realistic artwork is highly preferred. In Stage 3: Expressiveness, children ages 10 to 14, are interested in artwork that expresses another individual's experience, with subject matter less important. In Stage 4: Style and Form, children ages 14 to adult perceive social significance as important.

McGhee and Dziuban (1993) conducted a study with 40 children, ages 2 or 3, showing them nine pairs of abstract and realistic paintings. Attempts were made to control for the effect of color by presenting paintings in each pair that represented similar color ranges. Results revealed that preschool children did not express a strong preference for abstract over realistic paintings, showing consistency over a five-week time period.

## 1.7 RESTORATIVE ENVIRONMENTS

### 1.7.1 Definition

A *restorative environment* is defined as an environment that supports a shift toward more positive emotional states, blocking negative emotions and thoughts of individuals. Restoration is brought about through a visual encounter with a scene having specific qualities, such as nature content, moderate complexity, and the presence of a

focal point (Korpela, 1996). Natural environments are especially well-suited to provide such as supportive setting. Environments are judged as natural under three conditions: 1) if the represented landscape is dominated by vegetation, water, and mountains; 2) if artificial features are absent or concealed; and 3) if the dominant contours are curvilinear rather than rectilinear (Ulrich, Lunden, & Eltinge, 1993). Therefore natural environments encompass a variety of outdoor settings, such as natural parks, open spaces, fields, and forests. Many studies have shown that stress can be reduced and positive feelings can be evoked through interaction with nature.

Ulrich, Lunden, and Eltinge (1993) found that recovering heart surgery patients exposed to nature art images reported less postoperative anxiety, in contrast with those exposed to abstract art images who experienced strong negative emotions or those who were who were exposed to no images. By people's very nature, they are capable of imagining themselves functioning in virtual worlds. Therefore, restorative environments can be either real or imagined places, while restorative experiences can happen either in a physical or an illusionary world, or a combination of both (Kaplan, Kaplan, & Ryan, 1998).

### **1.7.2 Theories of Restorative Environments**

The two main theories of restorative environments are the psychophysiological stress reduction framework of Ulrich (1983) and the attention restoration theory of Kaplan and Kaplan (1983). Ulrich's (1983) psychophysiological stress reduction framework assumes an existing preexisting condition of psychophysiological stress,

which is defined as a process of responding emotionally, physiologically, and behaviorally to a situation where well-being is challenged or threatened. Ulrich's model assumes that the initial response to the environment is affective rather than cognitive. Ulrich also focuses on emotional, mental, and physiological components of response to the taxing or threatening stimuli rather than attention-based deficits arising from everyday activity. Third, Ulrich's view of restoration derives more from reduction of arousal than from replenishment of attentional capacity. Specifically, Ulrich suggests that nature has a stress-reducing effect because it is a nontaxing stimulus that elicits positively-toned emotional states and blocks negatively toned feelings (Hartig, Mane, & Evans, 1991). These responses are alleged to occur because natural environments are associated with more positive affect, due to humans' predisposition to respond positively to surroundings conducive to survival or well-being.

Ulrich's research has focused on emotional and physiological recovery from stress. In a study Ulrich (1984) compared the records of 23 matched pairs of cholecystectomy patients who found that those who viewed nature scenes reported greater positive affect than subjects whose view was of a brick wall. In another study, subjects who watched photographic simulations of natural settings showed faster physiological recovery than those who viewed simulated urban settings (Ulrich, Simons, Losito, Fiorito, Miles, & Zelson, 1991). Physiological recovery was measured through skin conductance, muscle tension, and pulse transit time. Ulrich (1984) demonstrated that patients who viewed natural elements versus a brick wall from a hospital window, experienced more rapid recovery from surgery and less pain.

The attention restoration theory of the Kaplans differs from Ulrich's psycho-physiological theory, which is based on a preexisting condition of directed attention fatigue. Ulrich theorizes that restoration occurs with any prolonged mental effort that requires extended exercise of the inhibitory mechanism, which allows for directed attention (Kaplan & Kaplan, 1989). Their basic approach to the person-environment fit is that the informational processes of perception, attention, and planning that underlie all human efforts to function in the world. The Kaplans (1989) conclude that people have an intuitive sense for what they call restorative environments, which permit contemplation, and thus restoration. Restorative environments are intrinsically pleasurable, providing a sense of being away from the constraints of the everyday environment. This parallels the theory of positive distraction that posits that an environmental feature can elicit positive feelings and hold attention without taxing or stressing the individual, and therefore can block troublesome thoughts. Restoration can occur when four factors distinguish the interaction of person and environment. According to the Kaplans (1983), one factor is *being away* by securing psychological and/or geographical distance from one's regular environs. This may be a brief experience, as when an individual takes a mental break by gazing out the window, takes a walk in the woods, or takes an even longer break by going on a weeklong camping vacation. A second factor is *fascination*, defined as "effortless attention," which allows for an individual to relax efforts at inhibiting distractions, restoring attention capacity. Such natural phenomena as the chirping of birds, the sound of moving water, or the rustling of trees illustrate this concept. A third factor is *extent*,

referring to the prospect of immersion in an environment that is of sufficient capacity to sustain exploration and understanding. The fourth factor is *compatibility*, which refers to a match between personal tendencies and motivations and the support of the environment for proposed activities. Of these four factors, *compatibility* most aligns with an individual's own purposes and needs within an environment, such that directed attention is not needed and the individual is mentally allowed to relax (Korpela, 1996). Yet a high degree of compatibility cannot be found in environments lacking high degrees of being away, fascination, and extent (Korpela, 1996). Thus, restorative experiences appear to be linked to one's favorite places.

### 1.7.3 Favorite Places

Favorite places seem to afford restorative experiences that support emotion and self-regulation. In a study on favorite places, Korpela (1992) found that subjects frequently identified natural environments as their favorite places, along with other settings such as local cafes or their room at home. Ulrich's psychophysiological stress reduction theory posits that natural environments more often will be more restorative than many urban environments (Korpela, 1992). Both the attention restoration and stress reduction frameworks assist in clarification of emotion and self-regulation as they relate to the restoration process. Both theories focus on elements of person-environment interactions that might contribute to place-identity, thus generating restorative environments.

Korpela's (1992) study was designed with 78 undergraduate students who evaluated their favorite place from seven different settings. The Perceived Restorativeness Scale (PRS) represents factors set out in the attention restoration theory with 16 items intended to demonstrate presence of the factors being away, fascination, extent, and compatibility. Results revealed that for both favorite and unpleasant places, the subjects' selections varied considerably in their physical characteristics. Many of the favorite places were natural settings, whereas unpleasant places often had traffic or crowds.

With respect to favorite places, 83.3 % of the subjects noted the presence of a beautiful view (vs. 2.6% for unpleasant places), 83.1% (vs. 16.7%) noted sunlight present, and 73.1% (vs. 17.9%) indicated water presence. Unpleasant places noted were either factories of 48.1% (vs. 2.6% for favorite places) or urban places of 84.6% (vs. 26% for favorite places). Differences between the places are also reflected in the subjects' reports of the emotions they would feel in each, as assessed by the Zuckerman Inventory of Personal Reactions (ZIPERS). Subjects associated higher positive affect, lower anger/aggression, and lower fear arousal with their favorite places as compared to unpleasant places.

#### 1.7.4 Environmental Self-Regulation

Kaplan and Kaplan (1983) presents the idea of using the physical environment as a strategy in creating and maintaining one's self, referred to as *environmental self-regulation* (Korpela, 1989). This environmental self-regulation theory provides a

connection between restorative environments and place identity, by using a person's favorite place as an exemplar of environments to be used in self and emotion-regulation. Experiences in favorite places can be evaluated using conditions set forth in attention restoration theory (Kaplan and Kaplan, 1989). Recognizing that high levels of being away, fascination, extent, and compatibility characterize favorite place experiences, validation is secured for the notion that favorite places can be sources of restoration.

Concerns with respect to the restorativeness of favorite place experiences are strengthened by three components of Korpela's study results. First, subjects' identification of their favorite places was consistent with the literature on restorative environments, they were most often places with greenery, water, and scenic beauty. Second, the differences between evaluations of the favorite place and the unpleasant place were as anticipated, with levels of being away, fascination, extent, and compatibility highest in the favorite places and lowest in the unpleasant places. Third, the self-reported emotional states associated with each place were as predicted in terms of positive affect, anger/aggression, and fear arousal as measured by the PRS and ZIPERS scores (Korpela, 1991).

The concept of environmental self-regulation maintains that self-involvement in a physical environment is possible and that the physical environment itself can be used as a strategy for regulating emotions (Korpela, 1989). Favorite places can be used to regulate pleasurable and painful feelings and the coherence of self-experience.

Studies by Korpela (1989, 1996) suggest that restorative experiences play a part in self and emotion-regulation through which they develop place-identity. Place-identity

is defined by Korpela as consisting of cognitions of those physical environments in which an individual – consciously or unconsciously - regulates his sense of self-maintenance. Thus, place-identity is not a confused array of mental images and feelings about physical settings, but it has its own internal logic and coherence as a result of self-regulation (Korpela, 1989). Place-identity can be defined as “clusters of positively and negatively balanced cognitions of physical settings” (Proshansky & Fabian, 1987, p. 25). Thus emotional attachment is at the core of place-identity. This formulation does not limit a person’s place-identity to home and its environs, but translates to every physical environment that has a role in self-regulation. Adolescents provided self-report data suggesting that they use their favorite places to anchor emotion- and self-regulation.

Kaplan and Kaplan (1983) recommended that in order to enhance our understanding of restorative environments we should examine the types of environments people seek in attempting to recover from the stress and challenges of daily routines, as well as the level to which different environments promote such recovery. If certain places and the feeling of attachment to them can serve as a prerequisite for the balance of pleasure and pain, places described as favorite ones can be a potential initiating point and unit of analysis to discern what characteristics individuals seek in a restorative environment. It can be assumed that the environment can be a means of self-regulation, with resulting connection to it by individuals as they describe their favorite place and the reason for their selection of it.

Korpela (1989) conducted a preference study with students 9, 12 and 17 years old, which was designed to solicit descriptions of their favorite places. Younger students were given a questionnaire comprised of 10 questions about their favorite place. The 17-year-olds were asked to write an essay describing their favorite place and how it made them feel. Results revealed the feelings of enjoyment, pleasure, familiarity, and belonging toward a favorite place, which shows the pleasure and pain principle in operation (Korpela, 1989). Thus, it is possible to regulate the balance of pleasure and pain by means of an environment, since a place can induce a happy mood or generate sadness in an individual. Since a place is used also to calm down, this implies that the physical environment is used to regulate one's psychological state. A favorite place is also used to clear one's mind, as a means of producing coherence to clear one's thoughts and feelings. Descriptions of memories of the past and features of the place can be understood by interpreting them as psychological mechanisms connecting the physical environment to psychic self-regulation. Clearly, if the favorite place can be imagined or experienced as being "an understanding listener" or being capable of "encouraging you to try again," it helps one to maintain a coherent sense of self during a period of personal challenge (Korpela, 1989, p. 251). More often subjects described their favorite place by descriptors reflective of the place's effect on one's emotions and feelings rather than by purely physical elements such as colors, textures, or smells. Thus, the importance of a place is based on the effect of going to one's favorite place so one can regulate their state of mind. This supports the Kaplans' (1983) concept of a need for restorative environments and the importance of reflection.

Engler (1990) also suggests the possibility of using places as a strategy in self regulation. She alleged that “view places” engender a contemplative and meditative state of mind and provide an important emotional resource for an individual. *View places* refers to environmental sights that serve as settings for introspection, physical environments that support an individual’s attaining a renewed perspective on life’s challenges. An individual can visually embrace a sense of *being away*.

In studies of 4 to 11-year-old children, Hart (1979) determined that children search out quiet places to be alone. “These places very frequently carry water, dirt, or sand and are sites for hours of quiet introspection” (Hart, 1979, p. 171). So children, as well as adults, require restorative places, to replenish their psychological and physical functioning states. Korpela (1992) conducted an autobiographical study on favorite places of adolescents, which revealed that these selected places provided a setting to foster self-regulation. Subjects reported that “they calmed down, could sort their feelings, or felt that the place was part of themselves” (Korpela, 1992, p. 256). Kaplan and Talbot (1983) posit that micro restorative experiences prolong the benefits received from more major experiences, which could have implications for restorative qualities of art in pediatric healthcare.

### **1.7.5 Favorite Outdoor Environments**

Owens (1988) conducted a study on outdoor places adolescents value and why they value them. The subjects of the study were 25 adolescents, ages 14 to 18. Many of the subjects in the study valued outdoor places where they could be with nature (70%),

where they could get away from other people (66%), or where they could be with their friends (30%). Most teens expressed a need to be in a place to look out and not be seen (64%). The most favored place type selected by all subjects was a natural park, with clear circulation and few man-made elements. The characteristic most often cited that was offered by the natural parks and not other places, such as home and school environs, was beauty. The natural park was also one of the best places for adolescents to put things into perspective.

The second most favored place type selected by subjects was undeveloped agricultural land. Although similar to natural parks, undeveloped agricultural lands differ in that they include private as well as public grazing of cattle and horses. The places selected least often were school, commercial areas, and communal green belts (Owens, 1988).

Characteristics of outdoor places that teens need and value are natural and undeveloped landscapes; gathering places; places to be alone; freedom; activity; the ability to see without being seen (prospect and refuge, as defined by Appleton (1996); unsupervised yet safe places; accessible places; and places they can call their own, known as symbolic ownership (Owens, 1988).

According to Korpela (1991), “environmental strategies involve the use of places, place cognitions and affect in the service of emotions and self-regulation” (p. 221). Korpela (1991) found that 17-to-18 year old adolescents after emotionally negative events often went to solitary favorite places, which helped them “relax, calm down, clear their minds, and gain perspective on things.” These favorite places provide

emotional release and restorative experiences. The results might suggest that favorite places are used to regulate not only one's experience, but emotions as well. Emotions are affected and modulated by some external factor such as a particular place or a particular environmental element such as an art image. According to Korpela (1989), if the favorite place can be imagined as being "an understanding listener" (p. 249) it helps one during a difficult period. It can remind one of the past experiences in a place which can regulate one's state of mind by securing comfort.

Korpela (1991) proposed that physical environments can be used to regulate pleasure/pain and self-experience and that identity with a place is partly formed by experiences and cognitions generated by those regulation processes. The concepts of self and emotion-regulation provide a connection between the place-identity model and the restorative environments theory. Self and emotion-regulation are not only inner homeostatic processes, but also involve interaction with the environment (Dodge & Garber, 1991). Emotion regulation has been defined as "intra- and extra-organismic factors by which emotional arousal is redirected, controlled, modulated, and modified to enable an individual to function adaptively in emotionally arousing situations" (Cicchetti, Ganiban, & Barnett, 1991, p. 18). Self and emotion-regulation imply the probability of intermittent changes from negative to more positive emotions, which are also characteristic of restoration (Korpela, 1996). Theories about restorative experiences and environments reveal processes that support the development of place identity.

## 1.8 ADULT STUDIES IN RESTORATIVE ENVIRONMENTS

Based on studies with adults and the beneficial effects of representational nature art on adults experiencing stress and anxiety in a number of healthcare settings, it is probable that children should be affected in similar ways. Studies with adults have consistently provided evidence that viewing nature produces rapid stress recovery quickly evident in physiological changes, such as blood pressure and heart activity (Ulrich, 1991). In a study of gall-bladder surgery patients, where one half of the views from the patient rooms overlooked green tree vegetation, and one half overlooked a building's brick wall, postsurgical outcomes data revealed that patients recovering from abdominal surgery with the nature view had shorter postoperative hospital stays, received fewer negative comments about their conditions in nurses' notes, and tended to have lower scores for minor complications (Ulrich, 1984). Study results with 300 inpatients rating a variety of art images indicated that hospital patients consistently preferred representational nature art images but disliked or rejected abstract art (Carpman & Grant, 1993).

An increasing number of research studies are providing supportive evidence that visual exposure to nature improves outcomes such as stress and pain reduction. A case in point is a study with heart surgery patients in the ICU of a Swedish hospital conducted to compare recovery outcomes of six groups of patients. Each group was assigned a different picture exposure following surgery: nature and abstract images similarly dominated by greens and blues but varying in complexity levels. Results

indicate that patients exposed to a representational, nature image experienced less postoperative anxiety than patients assigned to the five other visual conditions. These same patients also required fewer doses of strong pain medication but a higher intake of moderate strength pain analgesic (Ulrich, Lunden, & Eltinge, 1993).

Short-term visual contacts with nature can be effective in promoting recovery from stress. In research by Heerwagen and Orians (1990) on patient anxiety in a dental fears clinic, research data based on heart rate measurements suggested that patients experienced lower stress on days that a large mural depicting a natural scene was hung on the waiting room wall, versus days when the wall was left blank. A study by Coss (1990) with patients on gurneys viewing ceiling mounted pictures, revealed that patients exposed to scenes of nature and/or water had systolic blood pressure levels 10 to 15 points lower than patients exposed to either aesthetically pleasing “arousing” pictures or a control condition of no picture.

Research studies have shown that an important relationship exists between the experience of nature and the ability to achieve restoration through positive distraction (Hartig, Mang, & Evans, 1991, Heerwagen & Orians, 1990, Kaplan & Talbot, 1983, Ulrich, 1981, 1984, 1991, 1992, 1993). Nature serves as a positive distraction, by reducing stress and redirecting patients from focusing on their pain or discomfort (Ulrich, 1991). In a randomized controlled experiment, volunteer subjects in a hospital were asked to wear an eyeglass that projected either natural scenery or a blank screen, and to assess pain inflicted by a modified tourniquet technique. Study results demonstrated that visual stimuli of natural scenery increased the pain threshold and pain

tolerance (Tse, Ng, Chung, & Wong, 2002). Another controlled experiment found that adult patients undergoing a painful bronchoscopy procedure reported less pain when assigned to a room with a ceiling-mounted nature scene rather than to a control condition consisting of a blank ceiling (Diette, Lechtzin, Haponik, Devrotes, & Rubin, 2003). A study of 17 elderly residents, ages 71 to 98, in a residential care facility revealed that exposure to nature in an outdoor garden reduced stress, as measured by cortisol in subjects' saliva, when compared to residents not exposed to the nature setting (Rodiek, 2002). In addition, the findings of a study in an elderly living facility demonstrated that access to nature in the main lobby area is beneficial in fostering social relationships between residents and overall social life (Lee, 2003).

## 1.9 BIOPHILIA HYPOTHESIS

The *biophilia hypothesis* “asserts the existence of a fundamental, genetically based, human need and propensity to affiliate with life and life-like process” (Kahn, 1997, p.1). It suggests that certain advantages associated with natural settings during evolution were so critical for survival as to favor the selection of individuals who acquired various adaptive responses for survival. From this, as a remnant of evolution, modern humans have a biologically prepared readiness to learn and persistently retain certain responses to nature versus urban environments. Thus humans have a partly genetic predisposition to readily acquire and persistently retain liking/attention/approach responses to natural elements that favor survival (Ulrich, Lunden, & Eltinge, 1993).

A general evolutionary prediction is that certain broad classes of natural elements, in particular water, green vegetation, and flowers, should be preferred over most modern man-made elements such as concrete and glass (Kaplan and Kaplan, 1989, Ulrich, 1981). Individuals should respond positively to these elements because throughout evolution they have directly and indirectly indicated the presence of two survival necessities: water and food (Ulrich, Lunden, & Eltinge, 1993). According to Wilson (1984), the biophilic instinct emerges, often unconsciously, in our cognition, emotions, art, and ethics, and unfolds in the predictable fantasies and responses of individuals from early childhood onward. Yet, only a few studies have investigated children's biophilic cognition and, more precisely, their reasoning about nature, and the ways in which it evolves and is organized (Kahn, 1997).

If through evolution certain natural landscapes have promoted human survival, then postulations can deduce that such landscapes nurture the human physiology and promote a sense of emotional well-being. For example, findings from over 100 studies have shown that stress reduction is a primary perceived benefit of recreating nature settings that resemble the savanna (scattered trees, grassy underbrush), which include art integrated into the environments (Ulrich, Lunden, & Eltinge, 1993). Thus, the importance of the biophilia hypothesis is that it provides a substantial framework with cross-disciplinary research that can generate greater understanding of human relationships with nature.

## CHAPTER II

### RESEARCH METHODOLOGY

#### 2.1 RATIONALE FOR THIS STUDY

The literature reviewed in the previous chapter provided support for the major hypotheses underlying this study, specifically that 1) there will be distinct differences in art preferences among four cognitive developmental age groups; 2) gender will have an impact upon art preferences; 3) there will be no difference in preference between school children and adolescents versus hospitalized children and adolescents; 4) younger children (5 to 10 years of age) will prefer nature, and that in the older age groups (11 to 17) children will prefer more abstract art as a function of their cognitive developmental stage; and 5) nature art should prove to have therapeutic benefits of healing by creating positive psychophysiological effects in pediatric healthcare.

This chapter discusses the overall methodological design for the three-phase study, which encompasses both quantitative and qualitative, with Chapter III providing more detail about the design and specific issues and hypotheses as they relate to the individual studies (refer to Table 2.1 for hypotheses).

**Table 2.1 Hypotheses**

1.	Distinct differences in art preferences will exist among four cognitive developmental age groups. It is anticipated that art preferences will vary based on cognitive development changes, with 5-10 age group preferring nature art, and that as children develop cognitively, they will increasingly prefer abstract art images.
2.	Gender will impact art preferences. It is anticipated that males will consistently prefer nature art with females preferring abstract art images.
3.	There will be no difference in art preference between school children and adolescents versus hospitalized children and adolescents.
4.	Younger children (5 to 10 years of age) will prefer nature, with older children (11 to 17) preferring more abstract art as a function of their cognitive developmental stage.
5.	Nature art should prove to have therapeutic benefits of healing. Compared to other art content and styles, representational, nature art will have more positive effects on stress reduction, and on emotional, and physiological well-being.

### 2.1.1 Hypotheses

1) It is hypothesized that there will be distinct differences in preferences of art among four cognitive developmental age groups. Based on Piaget's theory of child development, children move through specific cognitive developmental stages, which allow them to grow in mental processing and information-gathering abilities. Children at different ages construe the world in ways that are fundamentally different from adults (Gardner, 1982). Structure and level of cognitive development are important in understanding how children think and respond to art images at specific developmental stages. Piaget identified four stages of cognitive development: *sensomotor* (infancy: 0 to 2 years), *preoperational* (toddler/early childhood: 3 to 7 years), *concrete operational* (elementary/early adolescence: 8 to 11 years), and *formal operational* (adolescence/adulthood: 12 to 18+ years). It is predicted that younger children (5 to 10

years of age) will prefer representational, nature art and that in the older age groups (11 to 17) children will prefer more abstract art as a function of their cognitive developmental stage. According to Piaget (1930), younger children at the preoperational and concrete operational stages have limits to their abstract thinking, still learning from concrete evidence. Older children's thought becomes more abstract, generating abstract propositions. Thinking becomes less tied to concrete reality, with increased ability to think abstractly. As a result, younger children should prefer recognizable representational art, versus older children, who should prefer more abstract art images.

Parsons (1987) asserted that children from age 4 to adulthood continue to develop through predictable stages of aesthetic preference. In Parson's Stage 1: Favoritism, children, ages 4 to 7, find subject matter irrelevant, preferring abstract as well as realistic painting styles. In Stage 2: Beauty and Realism, Parsons proposed that subject matter becomes very important for children ages 7 to 10 with realism highly preferred. In Stage 3: Expressiveness, children ages 10 to 14, see subject matter as less important with an interest in artwork expressing the experiences of another individual. For children ages 14 to adult, at Stage 4: Style and Form, social significance within the artwork becomes important.

2) It is hypothesized that gender will have an impact on art preferences. In Sommer's (1990) study of 11- to -12-year-old Estonian children, boys were more likely than girls to prefer a natural setting as their favorite place, suggesting a greater preference of boys for nature. A study of outdoor versus indoor play preferences with 133 sixth and seventh graders suggests that gender differences exist when children

initially enter sixth grade, but that they change in seventh grade. As children enter and begin to move through middle school, their identities change from children to adolescents, so gender preference could be a product of developmental differences. (Pellegrini, 1992).

3) It is predicted that there will be no difference in art preferences between school children and adolescents versus hospitalized children and adolescents.

4) It is predicted that younger children (5 to 10 years of age) will prefer nature, and that in the older age groups (11 to 17) children will prefer more abstract art as a function of their cognitive developmental stage. Because little research has been conducted in this area of children and the healing effects of art, there is a need to reference literature from studies that provide information on environmental preferences. In a study focused on outdoor places valued by adolescents, twenty-five 14 to 18-year-olds stated that the most popular place type by all teens was a natural park...many stated 'It's very peaceful...' (Owens, 1988, p. 18). In a study by Inez Ramsey (1982), 255 first-, second-, and third-grade students were asked to discern art style preferences in textbooks. Both girls and boys preferred realistic photographs to cartoons, expressionistic and realistic images. In another study by Ramsey (1989) with 264 students in first, second, and third grades, realism was a factor in influencing preference of art images.

5) It is hypothesized that nature art should prove to have therapeutic benefits of healing by creating positive psychological and physiological effects in pediatric healthcare. Because very little research has been conducted on the effects of art and the healing process as it relates to children, the hypothesis that children prefer

representational nature art to abstract art is based upon research findings of adults who prefer nature art over abstract art (Ulrich, 1999).

### **2.1.2 Multimethodology**

A three-phase study was designed to address these issues, using methods appropriate for each inquiry. This multimethod approach, often referred to as triangulation, refers to different investigative methods applied to one research entity (Erzberger & Prein, 1997). Using a variety of methods reduces the possibility of bias due to a particular methodology or the omission of significant issues, and it also increases validity. Fitzpatrick and Boulton (1994) provide a constructive definition describing multimethodology as the use of as wide a range of sources as possible in order to support certain hypotheses. Zeisel (1981) advocated the use of triangulation because different traits of a complex phenomenon can be observed by using multiple tools to reduce possible errors.

Researchers often use the multimethod approach to enhance validity. Multimethodology research design encourages the researcher to approach their research questions from different angles, recognizing that social phenomena are more than one-dimensional (Meetoo & Temple, 2003). Different methods using various processes to construct findings are valuable in contexts using data generated in different ways (Mason, 1996). Qualitative and quantitative data can cross-validate each other for a common reference point, generating more unbiased research results. In this research

study, both quantitative and qualitative methods were combined, while controlled quasi-experimental methods were used to measure health-related outcomes.

### **2.1.3 Quantitative Method**

Quantitative research is a formal, objective, systematic process in which numerical data are utilized to obtain information about the world. Quantitative research begins with the collection of statistics, based on real data, observations, or questionnaires (Brewer & Hunter, 1989).

Quasi-experimental design is a type of quantitative research that was developed to provide alternate means for examining causality in situations that were not conducive to experimental control (Burns & Groves, 1997). The design was developed to control as many threats to validity as possible in situations in which at least one of the three elements of true experimental research (i.e. manipulation, randomization, and control group) is lacking. *Validity* refers to whether a particular instrument actually measures the construct it is designed to assess (Sommer & Sommer, 1997). This study is a quasi-experimental approach using equivalent control groups randomly selected from a general pediatric diagnostic group.

### **2.1.4 Qualitative Method**

Qualitative research emphasizes the importance of looking at variables in the natural setting in which they are found. Interaction between variables is important.

Detailed data is gathered through open-ended questions that provide direct quotations. The interviewer is an integral part of the investigation (Strauss & Corbin, 1990). Qualitative inquiry has the ability to discern explanatory holistic frameworks, to interpret informants' behavior and interaction, as well as how meanings emerge (Strauss & Corbin, 1990).

The relationship between qualitative and quantitative methods can be characterized as complementary rather than exclusive. There are at least three ways in which this can be achieved. First, qualitative work can be conducted as an essential preliminary step to quantitative research. Second, qualitative techniques such as observation, in-depth interviews, and focus groups can be used to provide a description and understanding of a situation or behavior to be used in a subsequent quantitative study (Pope, 1995). This can be part of the validation process, as in triangulation, in which three or more methods are used and the results compared for convergence (for example, a large-scale survey, focus groups, and a period of observation), or as part of a multimethod approach that examines a particular phenomenon or topic on several different levels (Pope, 1995).

The third way in which qualitative research can complement quantitative work is by exploring complex phenomena or areas not amenable to quantitative research. The value of this sort of stand-alone qualitative research is increasingly recognized in studies of health service organization and policy (Pope, 1995).

In this study, qualitative research was implemented through focus group discussions to discern art preferences in children and adolescents. A focus group

interview is designed to explore what a specific set of people think and feel about a particular topic. Group sizes range from eight to twelve people – small enough to allow constructive discussion, but large enough so that a single person is unlikely to dominate (Sommer & Sommer, 2001). Focus groups can produce a depth and variety of responses that reveal perceptions and concerns that might go undetected with another type of research method (Sommer & Sommer, 2001).

Correlational studies are also known as ex post facto studies. This literally means “after the fact.” The term is used to identify that the research in question has been conducted after the variations in the independent variables have occurred naturally. The basic purpose of this form of study is to determine the relationship among variables. However the significant difference from experimental and quasi-experimental design is that causality cannot be established due to lack of manipulation of independent variables. Correlation does not prove causation.

### **2.1.5 Inquiries for Each Phase**

A sequence of three studies was designed to investigate the main questions of this investigation: Phase 1: 1) What type of art do school children and adolescents prefer? 2) Are there differences in art preferences based on gender? Phase 2: 1) What type of art do hospitalized children and adolescents prefer? 2) Are there differences in art preferences based on gender? 3) Are there differences in art preferences between school children versus hospitalized children?

Phase 3: 1) What type of art is most effective in reducing stress with pediatric patients?  
2) Are there differences among cognitive developmental age groups and the types of art that are most effective in lowering stress with pediatric patients? The results from Phase 1 and Phase 2 studies helped determine the selection of art for Phase 3.

## 2.2 DATA

### 2.2.1 Overview of Study

A three-phase study was conducted to examine explicitly what type of art children prefer and what reduces stress in four developmental age groups (5 to 7, 8 to 10, 11 to 13, 14 to 17 years of age). Phase 1 was a focus group study to discern art preference among four developmental age groups in four schools (elementary, middle, and high school) in Beaumont, Texas. The schools were Regina Howell Elementary School, Marshall Middle School, All Saints Episcopal Middle School and Monsignor Kelly High School. These schools were selected in Beaumont due to their proximity to the researcher and the broad socioeconomic status of the students, including both private and public school participants (refer to Appendix A). Participating students brought a favorite picture to the focus group discussion. After each student expressed reasons they liked their particular picture, the researcher showed the group six art images to discern which image was their favorite. All focus group discussions were videotaped. Phase 2 was a structured preference study conducted with pediatric patients from Scott & White Hospital in Temple, Texas, and CHRISTUS St. Elizabeth Hospital in Beaumont, Texas. Scott & White Hospital has a 21 bed pediatric unit, with ages

ranging from infants to 19 years. Scott & White Hospital also has a Neonatal Intensive Care Unit (NICU), Special Care unit, and a Pediatric Intensive Care Unit (PICU) within the Children's Hospital, totaling 68 beds (refer to Figure 2.1). CHRISTUS St. Elizabeth's pediatric unit which includes a NICU has 16 beds with a patient population ranging in age from newborn to 18 years (refer to Figure 2.2).



**Figure 2.1.** Scott & White Hospital: Pediatric Unit - Visuals

Patients viewed six art images on a laptop computer to determine their preferences. The laptop computer used for the study had a 15” screen, with art images generated through a PowerPoint™ presentation program. Children ages 5 to 7 were read questions for their responses. The researcher documented children’s and adolescents’ response by written text, determining which art image was their favorite.

Phase 3 was conducted with pediatric patients from Scott & White Hospital and CHRISTUS St. Elizabeth Hospital, who viewed a selected art image placed in their hospital room, in an effort to discern what kind of effect the art has upon their psychological and physical well being. Scott & White and CHRISTUS St. Elizabeth were selected due to the institution strong commitment to research and healing environments for children.

A methodological strength of the present study is the incorporation of both patient-report and parent-report measures of emotional functioning in an effort to control shared method variance. *Shared method variance* refers to the association between two or more constructs that is solely due to the method used (Salazer, 1998).

**Patient Room****Nurses Station****Activities Center****Corridor****Figure 2.2.** CHRISTUS St. Elizabeth Hospital: Pediatric Unit-Visuals

### 2.2.2 Permission for Research Studies

Written permission for the research studies at Regina Howell Elementary School, Marshall Middle School, and Westbrook High School was secured from the

superintendent for the Beaumont Independent School District, as well as by verbal permission from the principals for each individual school (refer to Appendix C). Verbal permission for research in private schools was secured directly from the respective principals, Lori Preston and Roger Beamis, at All Saints Episcopal Middle School and Monsignor Kelly High School.

Research permission for Scott & White Hospital was obtained through Jan Upchurch, director of child life, and the hospital's Institutional Review Board (IRB) (refer to Appendix F). Permission for research in pediatrics at CHRISTUS St. Elizabeth was secured from Joel Fagerstrom, CEO, and Mauva Colbert, director of nursing, as well as the hospital's Institutional Review Board (IRB) (refer to Appendix G).

### **2.2.3 Selection of Art Images**

Selection of art images was based on artistic style, defined as the mode of expression by an artist. Artistic style can vary from extreme realism to extreme abstract representation of an artist's subject (Mayer, 1969). The six art images selected for Phase 1 and Phase 2 were: 1) impressionistic, nature (beach) with human subjects; 2) abstract, no identifiable subject with calm color; 3) abstract, subject with intense color; 4) abstract, animal subject; and 5) abstract, complex, chaotic; and 6) representational, nature scene. Art images were purchased through Unique Arts, a wholesale art supplier located in Houston, Texas. For each art category, the researcher and research assistant researched art images through categorical catalogues to secure appropriate art images, narrowing the selection to six images. Eight senior art students from the Lamar University Art

Department made final selections, based on traditional definitions of art categories provided.

#### **2.2.4 Art Categories**

Nature, representational artistic style is an artist's idea of the subject, one which conforms as nearly as possible to the subject in its true form and contains considerable detail and facts about the object (Mayer, 1969). Impressionistic artistic style is characterized by concentration on the immediate visual impression produced by a scene and by the use of unmixed primary colors and small strokes to simulate actual reflected light (Mayer, 1969). Abstract artistic style seeks to break away from traditional representation of physical objects. It explores the relationships of forms and colors, whereas more traditional art represents the world in recognizable images (Mayer, 1969).

The variety in the collection of the six art images for Phase 1 and Phase 2 was based on the research on adult art preferences (Ulrich, Lunden, & Eltinge, 1993), in which the majority of adult patients preferred representational, nature art images over abstract images. The researcher selected one representational, nature art image containing the evidence-based recommended elements by Ulrich (1993); depth perspective with visibility, trees, and a water element. Consistent with the preference for nature, one impressionistic, nature (beach) scene with people socializing was included. In order to compare art preferences, four different abstract art images were selected, differing in degree of complexity and color. Art images ranged from those in which the dominant

a complex, chaotic art image with a variety of intense colors (red, blue, orange). Cool colors such as blue stimulate the parasympathetic nervous system, which produces a calming effect on the body, whereas red has a stimulating effect on the sympathetic nervous system, increasing blood flow to the muscles and boosting brainwave activity. This process raises blood pressure levels, accelerating heart and respiratory rates (Grappell, 1995). Abstract art images were selected to help determine if colors, complexity, or animal content would affect preference.

## **2.3 METHODS**

### **2.3.1 Phase 1: Data Collection from Focus Groups**

A focus group study was conducted with four developmental age groups in three schools in Beaumont, Texas involving age groups 5 to 7, 8 to 10, 11 to 13, and 14 to 17. Each focus group was composed of 15 students, with two groups from each age group (for a total of eight groups). Students were selected from science classes, rather than art classes, so as to avoid a bias toward art. The letter outlining the research (refer to Appendix D) was sent home to parents via the children and was accompanied by an informed consent form (refer to Appendix E), for the parents to sign and return to the researcher, approved by the Texas A&M University Institutional Review Board (IRB). Students were asked to bring their favorite picture for discussion to avoid any predetermined favoritism based on pictures provided by the researcher. Discussions

lasting from 45 to 60 minutes were conducted in the classroom for each group. Each student shared their respective pictures and discussed what they liked about their pictures and why.

During the last ten minutes of the discussion, after each child had the opportunity to discuss his or her art image, the researcher showed the students six different art images: 1) impressionistic nature beach scene with human subjects, 2) abstract, no identifiable subject with calm color, 3) abstract, subject with intense color, 4) abstract, with animal subject, 5) abstract, complex, chaotic, and 6) nature, representational of forest scene with water and animals (see Figure 2.3). The selection of art images was based on an adult study by Ulrich (1993), in which art images viewed ranged from a representational, nature (wooded forest scene with a vista and water element) to a chaotic, nonrepresentational abstract image (ambiguous rectilinear and curvilinear shapes and colors).

Semistructured interview questions were asked of children to determine preferences and justifications for their selections. Questions included What do you like about your picture? How do you feel when you look at your picture? What do you think about when you look at your picture? All focus group discussions were videotaped. The researcher and a research assistant viewed videotapes and analyzed data documented in written format. Data were analyzed according to student art preference, developmental age group, number of male or female students, and number of students preferring each art image. Data were generated to discern patterns of preference that surfaced during discussions, based on gender and cognitive age development levels.

1) Impressionistic nature beach scene  
with human subjects



2) Abstract, no identifiable subject  
with calm color



3) Abstract, subject with intense color



4) Abstract, with animal subject



**Figure 2.3.** Phase 1 and Phase 2: Art Images

5) Abstract, complex, chaotic



6) Nature, representational of forest scene with water and animals



**Figure 2.3.** continued

- 1) Source: Dina Art, 2002; 2) Source: 2006 Gregory Garrett, "Stabile Orb" exclusively published and distributed by Grand Image, Ltd, Seattle Washington;  
 3) Source: reprinted with permission of Waugh-Louise-Modern Art, 2000;  
 4) Source: Ting-Art Wise, 1999; 5) Source: Hockney-Graphique De France, 2000,  
 6) Source: reprinted with permission of Aagard-Top Art, 2001

### 2.3.2 Phase 2: Study of Hospitalized Pediatric Patients

A randomized study was conducted with pediatric patients at Scott and White Hospital and CHRISTUS St. Elizabeth Hospital in which participants were selected based on age and gender categories. The typical profiles of pediatric patients in both hospitals were either Caucasian or African American from a range of socioeconomic levels, with varying nonchronic medical conditions. A total sample group of 48 participants was randomly selected from patients admitted to the pediatric units at each hospital. Twelve patients comprised each of the four age groups, with an even distribution of males and females. Prior to subject participation, written acceptance was secured through informed consent forms signed by the parents (refer to Appendix H) and assent forms from patients 7 to 17 years of age (refer to Appendix I). Informed consent forms were approved by the respective hospital Institutional Review Boards (IRBs).

Each patient was shown six art images on a laptop computer (refer to Figure 2.3); they could control the viewing time of all six images up to approximately 10 minutes. The researcher asked patients to express their art preferences and documented resulting responses. Patients were asked to state *if they like it* and *how it makes them feel*. The researcher and one research assistant analyzed the data from Phase 2. From these data, two art images were selected for Phase 3, one chaotic (very complex) abstract, and one representational, nature to provide images from the extremes of the continuum of most favored to least favored (refer to Figure 2.4). Participants for both Phase 2 and Phase 3 were excluded from the experiment if they were mentally disabled or heavily sedated, in which case cognitive impairment would prevent effective responses in the study.

### **2.3.3 Phase 3: Pilot Study of Health-related Effects**

The purpose of Phase 3 study was to determine if art placed in the hospital room is therapeutic, contributing to less stress experienced, and to determine which type of art image is most therapeutic.

A study was conducted with pediatric patients at Scott & White Hospital and CHRISTUS St. Elizabeth Hospital. Pediatric participants were selected based upon age categories on admittance to the pediatric ward. A total of 12 patients from each age group were selected for a total sample group of 48 participants. The study used a randomized, controlled quasi-experimental method to measure health-related outcomes by taking measurements before and after a brief (2-hour) exposure to art or to no art in their hospital room. Quasi-experimental methods were selected as most suitable for measuring health outcomes, due to the need to generate scientific evidence to influence healthcare decision-makers of the importance of environmental influences on the healing process of patients (Ulrich, 1984, 1993, 1996). Once patients were located in their hospital rooms, the researcher explained the study and obtained written informed consent from a parent or guardian (refer to Appendix J) and written assent from the subjects 7 to 17 years of age (refer to Appendix K). The nursing staff assisted with data collection at CHRISTUS St. Elizabeth Hospital by administering the initial Time 1 PFM forms to the patient and parents, once they were located in their hospital rooms, while the researcher collected Time 2 data. Nurses at both hospitals took and provided information on vitals (blood pressure and respiratory rate) for all subjects.

The sample group was evenly divided in thirds. Two different art images were randomly placed in two thirds of the patient's hospital rooms (refer to Figure 2.4). The other one third, the control group, had no art displayed. Each 24" by 36" art image was placed on the wall opposite each patient bed for a 2-hour period.

Nature, Representational



Abstract, complex, chaotic



**Figure 2.4.** Phase 3: Art Images

(Left image: source, reprinted with permission from Aagard-Top Art;  
Right image: source, Hockney-Graphique De France)

#### 2.3.4 Research Instruments

Distress was measured using the Varni PedsQL™ Present Functioning Module (PFM) (reprinted with permission of Information Resources Centre of Mapi Research Trust (refer to Appendix L), which was analyzed by the researcher to determine if there

were significant differences between the three groups of patients (Sherman, Shepley, & Varni, 2005a). Each patient and a parent were given the PedsQL™ PFM prior to being shown the art images to test their emotional state prior to viewing art. This questionnaire was administered a second time 2 hours later (Sherman, Shepley, & Varni, 2005a).

The PedsQL™ PFM is a six-item questionnaire that asks about anxiety, sadness, anger, worry, fatigue, and pain in the present moment. All versions of the PFM utilize a visual analogue scale, a 10 cm line anchored at one end with a happy face and at the other end with a sad face, used to answer each of the items. The instructions for the child and teen self-report, for example, ask subjects are as follows: "Please put a mark on each line that best shows how you feel now. If you have no problem and feel fine, put a mark at the end of the line by the happy face. If you have some problems and do not feel that well, put a mark near the middle of the line. If you feel very bad or have lots of problems, put a mark by the sad face." The PedsQL™ has four versions: a Parent-Self Report (e.g., "I worry about what will happen to my child"); a Parent-Report for Children (e.g., "My child worries about what will happen to him/her"); a Child and Teen Self-Report (e.g., "I worry about what will happen to me"); and a Staff Self-Report (e.g., "I worry about what will happen to my patients"). For this study, only the Parent Report and the Child & Teen Self-Report were utilized.

The research study was structured to obtain self-reported information directly from the children, in addition to that from the parents or other caregivers, to ensure children's emotional states were accurately reported. This design was based on the

research conducted by Yamamoto and Felsen (1982) in which only a moderate correlation between children's and adult's ratings of stressfulness were found.

The Varni PedsQL™ PFM provided a validated measurement instrument that is designed to be explicitly sensitive to children and adolescents' particular cognitive developmental stages (Varni & Bernstein, 1991). This instrument is similar to the Wong-Baker FACES Pain Rating Scale (FACES) used to evaluate children's predictions of pain. Wong and Baker (1988) reported validity and reliability of this instrument for children ages 3 to 18. Children also prefer the face instrument to other assessment tools in evaluating pain (Wong & Baker, 1988). In the past efforts at emotional evaluation of children were based on parent-assessment tools.

Medical chart data collected included 1) heart rate and 2) respiratory rate taken at admittance, then two hours later by nursing staff for additional data to evaluate the healing effects of art on patients. Room numbers, dates, patient gender, and age were used to reference medical chart data to the PedsQL™ PFM.

### **2.3.5 Reliability of PFM Instrument**

In response to the need for a measure for pediatric emotion assessment, Varni developed the PedsQL™ PFM, a comprehensive instrument that provides an assessment of patient and parental perceptions of youth's emotional state in a manner appropriate for the cognitive developmental level of children and adolescents. The PedsQL™ PFM builds on the research with the Varni/Thompson Pediatric Pain Questionnaire 10cm

VAS (Varni, Thompson, & Hanson, 1987; Varni, Waldron, Gragg, Rapoff, Bernstein, & Lindsley, et al., 1996c). The PedsQL™ PFM was first used in a study on three healing gardens surrounding a pediatric cancer center (Sherman, Varni, Ulrich, & Malcarne, 2005b). The *PedsQL™ PFM* was used to evaluate the present functioning state of visitors, pediatric patients, and staff, measuring anxiety, sadness, anger, worry, fatigue, and pain, to determine whether present functioning (at the moment of assessment) was better in the garden than when inside the hospital. Results revealed consistently for all domains that in-hospital distress scores were higher than in the gardens, as hypothesized.

Since cognitive developmental stages significantly influence children's ability to understand and respond to adult measures of emotion and/or pain, a developmentally sensitive measurement instrument is important to obtain a valid measurement of the child's emotional state. Pediatric health related quality of life (HRQOL) measurement instruments must be sensitive to cognitive development and include child self-report and parent proxy-report to reflect their unique perspectives (Varni, Burwinkle, Dickinson, Sherman, Dixon, Ervice, et al., 2004). Inconsistent agreement between self-report and proxy report, termed cross-informant variance, has been consistently documented in HRQOL assessment of children with chronic conditions and of healthy children (Varni, Rapoff, Waldron, Gragg, Bernstein, & Lindsley, 1996c). Evidence of cross-informant variance and general acceptance of an individual's perceptions of their psychophysiological functioning indicate there is a need in pediatric quality of life

measurement for reliable child self-report instruments. Even though self-report is considered the acceptable tool for measuring perceived HRQOL, parents' perceptions of their children's HRQOL normally influence decisions in pediatric healthcare. Consequently, the inconsistent agreement between child self-report and parent proxy report supports the need to measure both perspectives from the child's and the parent's in order to effectively evaluate pediatric HRQOL.

The PedsQL™ (Pediatric Quality of Life Inventory) Measurement Model was designed as an instrument by Varni and colleagues to focus on the child's perceptions of their present functioning state. The parent proxy report directly corresponds to the child self-report, generating both reliability and validity for the self-report instrument.

Acceptable validity for pain measurement findings for children 5 years of age and older has been reported by McGrath (1987) and Abu-Saad (1984). Validation for the PFM is also provided by the successful implementation of a similar assessment tool, the Pediatric Pain Questionnaire (PPQ), a comprehensive instrument modeled after the most widely used adult pain assessment instrument, the McGill Pain Questionnaire (Gragg, Rapoff, Danovsky, Linsdley, Varni, Waldron, et al., 1996). The PPQ was used to assess pain in pediatric rheumatology. Results were determined by correlating questionnaire responses among parent, physician, and patient ratings of pain intensity at the time of initial assessment. Significant positive correlations were found among all ratings of the PPQ (Gragg, Rapoff, Danovsky, Linsdley, Varni, Waldron, et al., 1996).

In a study designed to measure the HRQOL in children and adolescents, and to compare the HRQOL in children with recurrent respiratory papillomatosis (RRP) using

the PedsQL™, the HRQOLs reported for healthy children and children with other chronic medical conditions (Lindman, Lewis, Accortt, & Wiatrak, 2005). The PedsQL™ version 4.0 generic core scales consist of 23 questions in 4 subscales (physical, emotional, social, and school functioning) for parent-proxy reporting on the HRQOL in children ages 2 to 4 years, for parent reporting for children 5 to 18 years, and for child self-reporting for ages 5 to 7 years (age-adjusted questions and rating scales) and 8 to 18 years. Children with RRP report a lower quality of life than do those who are healthy and a quality of life similar to that of those who have other chronic medical problems. The parent reports also reflect a lower quality of life for children affected by this disease, as compared with healthy children. The PedsQL™ demonstrated a statistically significant low HRQOL in children with RRP (Lindman, Lewis, Accortt, Wiatrak, 2005). This instrument proved to be a valid self-report evaluation tool for children, as well as correlating with the parent proxy report.

The PedsQL™ is a relatively new instrument developed in the US to assess HRQOL in healthy and ill children and adolescents. This study reported the results that had been translated from the original U.S. generic core instrument and the cancer module into German and tested the German PedsQL™ in samples of pediatric patients who have been treated for cancer or epilepsy. Clinical validity was confirmed by differences between the cancer and epilepsy groups in the expected direction and by the ability of the PedsQL™ to discriminate between subjects with different degrees of medical and psychosocial sequel (Felder-Puig, Frey, Proksch, Varni, Gardner, & Topf, 2004).

In a study of 381 children with epilepsy, age 6 to 15 years, and their parents, validated self-report and parent-proxy respondent HRQOL instruments were developed to accurately measure the impact and burden of epilepsy, as outcomes of interventions with affected children (Ronen, Streiner, & Rosenbaum, 2003). The data demonstrate sound psychometric properties for both related measures, which are easy to administer for children with epilepsy who are 8 years and older and their parents. The HRQL dimensions judged most important by children with epilepsy for the self-report measure were consistent with those of the parents for the proxy response measure. The parent-proxy measure should be useful as a complement to the child self-report measure in evaluating the validity of parental assessment of the child's health status in HRQOL assessment of children who are unable to respond independently.

### 2.3.6 Variables

An independent variable is the component of the study that is manipulated or stimulated and influences the dependent variable, which includes treatment, and the state of the variable, such as stress or anxiety. A dependent variable is the variable that receives manipulation or stimulus and is measured for the effect the treatment has had upon it. The independent variables in this study were the art images or *no art* placed in the room. The dependent variables were the patients' psychophysiological responses to the *art* or *no art*.

## **2.4 CONFIDENTIALITY OF SUBJECTS AND FACILITIES**

Pediatric patients are considered a vulnerable population for whom the protection of privacy is outlined in *The Belmont Report*, written by The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, dated April 18, 1979. This privacy is secured prior to the study by obtaining a signed written consent form and in Phase 3 by de-identifying information from medical charts. All information was kept confidential, with pediatric patients identified only by room number, age, and gender.

## **2.5 INSTITUTIONAL REVIEW BOARD PROCEDURES**

Before initiating any research, official approval was obtained from the Texas A&M University Institutional Review Board (IRB) (refer to Appendix B), then from the two medical facilities: Scott & White Hospital (refer to Appendix F) and CHRISTUS St. Elizabeth Hospital (refer to Appendix G). Procedures, criteria, and formats were different for each committee, with the focus for all being protection of human rights for study participants. Proposals and respective forms for each IRB were submitted for approval, with acceptance based upon corresponding revisions to their forms. Once corrections were made, the study was approved by the respective IRB committees from the two participating hospital.

## **2.6 INITIAL HOSPITAL SITE VISITS**

The researcher scheduled an initial informational meeting with Jan Upchurch, director of child life, Audrey Hubbard, director of pediatric the research study in pediatrics. The researcher outlined the study with a PowerPoint presentation to provide clear details about the study and secure support of all staff members, nursing, and the respective child life and nursing staff who served as support staff for Scott and White Hospital. Approval and support of the research study from the hospital's IRB was secured, and was research initiated on October 25, 2004, with data collection continuing for three weeks.

CHRISTUS St. Elizabeth Hospital: Initial contact was secured through Joel Fagerstrom, CEO of CHRISTUS St. Elizabeth Healthcare System. An introductory meeting was scheduled with Mauva Colbert, director of nursing, Sheryl Moran, director of pediatric nursing, and pediatric charge nurses to secure support for the study. A request for approval for the study was secured and approved in January 2005, with data collection initiated on February 16, 2005, and completed on May 12, 2005.

## CHAPTER III

### DATA ANALYSIS AND RESULTS

#### 3.1 MULTI-METHODOLOGY

The study utilizes the multimethod approach to investigate the art preferences of children and adolescents and the possible healing effects of art in pediatric healthcare. By using the multimethod approach, data can be secured from different perspectives (Zeisel, 1981). The multi-method approach can be used to collect data, reduce error, and provide high reliability and validity. The premise suggests that appropriate art can affect the healing process in pediatric healthcare by distracting patients and lowering stress. In all, there are five hypotheses that address pertinent factors in evaluating art preferences and art that has the potential to heal in the pediatric healthcare environment:

- 1) There will be distinct differences in art preferences among four developmental age groups.
- 2) Gender will have an impact upon art preferences.
- 3) There will be no difference in art preferences between school children and adolescents versus hospitalized children and adolescents.
- 4) Younger children (5 to 10 years of age) will prefer nature, with the older age groups (11 to 17) preferring more abstract art as a function of their cognitive developmental stage.

5) nature art should prove to have therapeutic benefits of healing by creating positive psycho-physiological effects in pediatric healthcare.

## **3.2 STATISTICAL ANALYSIS OF THE RESPONSES**

The researcher used the statistical software program SPSS 11.0 to analyze the results of the PedsQL™, blood pressure of subjects, and respiratory rates of subjects. The researcher evaluated the results through applicable statistical methods, to include the t test, chi-square, crosstabs, correlations, and multiple regression models.

### **3.2.1 Correlational Statistics**

Correlation is used to find a relationship between two variables but does not suggest cause and effect. *Correlation* is defined as “an association between scores on two variables for the same individuals or cases” (Sommer & Sommer, 2002, p. 278). In Phase 1 of this study, the researcher created two categories to find correlations between the variables: art images and age groups. The focus was to determine if age-related cognitive differences affected art preferences. Comparisons of art preferences for gender and age groups and art preferences between Phase I (schoolchildren/adolescents) and Phase 2 (hospitalized children) were conducted for most preferred art image using the Pearson chi square analysis. The relationships of the total two groups of art images score and the variables of the age groups were examined using the analysis of variance. Effect sizes for correlations are designated as small (.10), medium (.30), and large (.50).

### 3.2.2 Emotional Functioning Module

Phase 3: Using the PedsQL™ PFM, the child self-report ratings were correlated with the parent proxy report ratings to determine the strength of association among the raters. The concordance between child self-report and parent proxy report was determined through Pearson product moment correlation coefficients. Statistical analyses were conducted using SPSS for Windows.

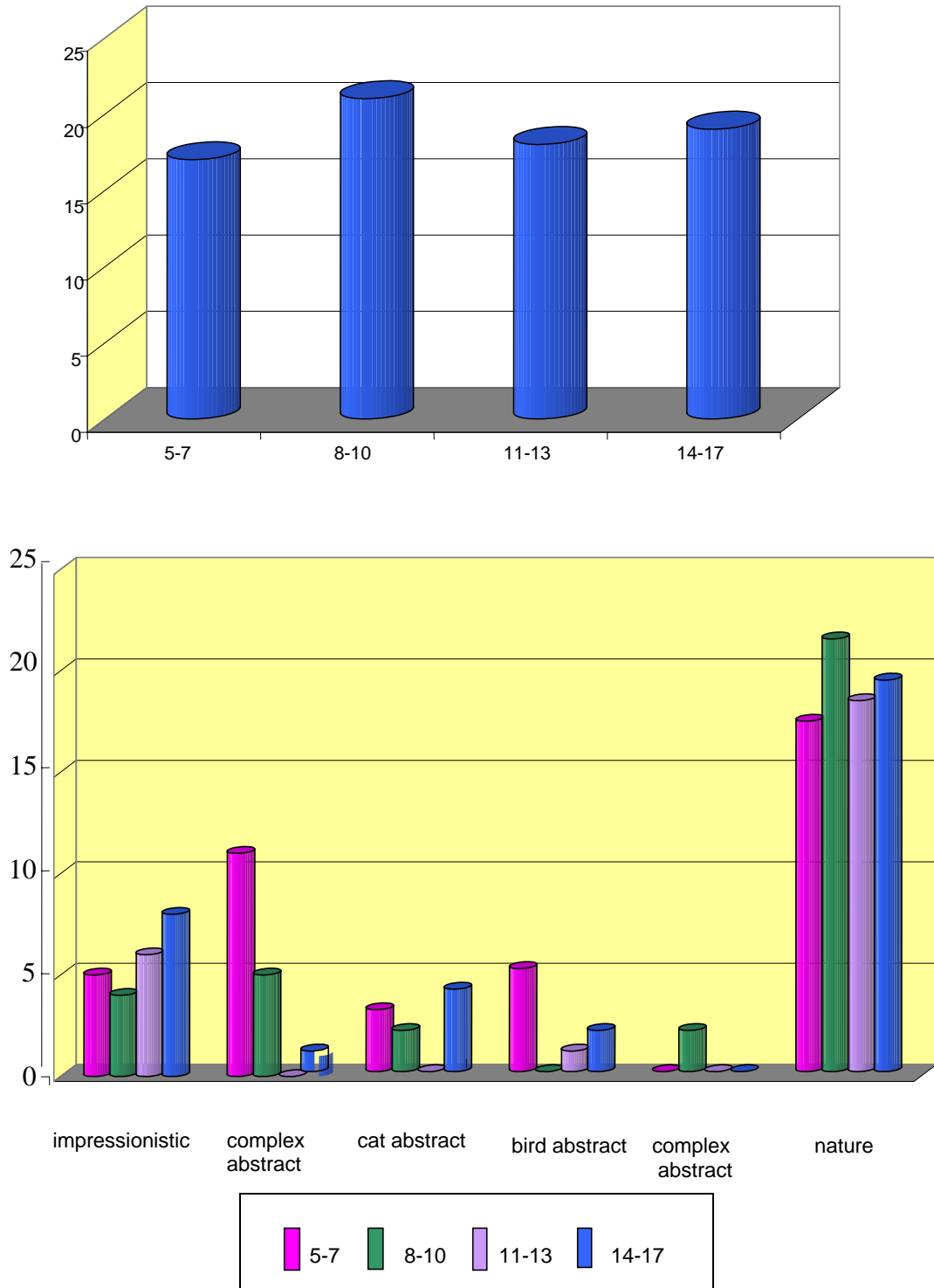
## 3.3 DATA RESULTS

### 3.3.1 Data Analysis: Phase 1: Focus Groups

A total of 129 subjects participated at four different schools ( $n=62$  males,  $n=67$  females). Overall, in all four age groups, 66% ( $n=77$ ) preferred the representational, nature art. A chi-square analysis was conducted to determine if there was a significant difference between male and female art preferences. There was not a significant gender difference in art preferences between male and female age groups, except in the 14 to 17 age group, in which the representational, nature image was preferred by a greater number of males versus females ( $df=5, p=0.023$ ). In the 5 to 7 age group, the chaotic abstract art image was more frequently preferred by males ( $n=3$ ), as compared to females ( $n=1$ ), where a greater number of females ( $n=2$ ) preferred the subject (cat) abstract. In the 8 to 10, 11 to 13, and 14 to 17 age groups, a greater number of females

versus males preferred the impressionistic art image (8 to 10 females:  $n=3$ , 8 to 10 males:  $n=0$ , 11 to 13 females:  $n=4$ , 11 to 13 males:  $n=2$ , 14 to 17 females:  $n=6$ , 14 to 17 males:  $n=2$ ) (refer to Table 3.1). The gender difference was greatest in the 14 to 17 age group, in which more males ( $n=10$ ) preferred the representational, nature art image, as compared to females ( $n=6$ ).

Though not statistically significant, there was a trend for representational, nature art to be rated as highest in art preference. A visual display of art preferences by age is shown in Table 3.1. In the 5 to 7 age group, 50% ( $n=17$ ) ( $df=4$ ,  $p=0.515$ ) preferred the representational, nature image, with the next highest preference as impressionistic nature at 23% ( $n=6$ ). In the 8 to 10 age group, 70% ( $n=28$ ) ( $df=3$ ,  $p=0.155$ ) preferred the representational, nature image, with the next highest preference being chaotic abstract at 24% ( $n=7$ ). Seventy percent ( $n=18$ ) ( $df=2$ ,  $p=0.071$ ) of the 11 to 13 age group also preferred the representational, nature with their next highest preference was the impressionistic nature scene 33% ( $n=6$ ). Fifty percent ( $n=16$ ) ( $df=4$ ,  $p=0.071$ ) of the 14 to 17 age group preferred representational, nature images with the next highest preference being impressionistic nature at 25% ( $n=8$ ). Refer to Figure 3.1.



**Figure 3.1. Phase 1 Comparison of Art Preferences**

### 3.3.2 Data Analysis: Phase 2: Hospitalized Patients

A total of 48 subjects (12 in each age group) participated in Phase 2 ( $n=24$  males,  $n= 24$  females), with the total from each healthcare facility approximately equal (Scott & White Hospital:  $n= 29$ , CHRISTUS St. Elizabeth Hospital:  $n= 19$ ). Representational, nature art was the preferred art image for males and females for over 60% in each of three older age groups: 8 to 10 ( $n=8$ ), 11 to 13 ( $n=8$ ), and 14 to 17 ( $n=8$ ). For the 5 to 7 year olds, 50% ( $n=6$ ) preferred nature, with the impressionistic, nature scene being the next favorite at 1% ( $n=2$ ). For the 8 to 10 age group, the chaotic abstract was the next preferred at 1% ( $n=2$ ); for the 11 to 13 age group, the cat abstract was their next preferred image at 1% ( $n=2$ ). There was not a second favorite in the 14 to 17 age group. Chi-square analysis determined that there was no significant difference between male and female art preferences in any age group.

### 3.3.3 Data Analysis: Comparison of Phase 1 and 2

For both study phases, representational, nature art was preferred, with no significant difference between age and art preference ( $F$  value=80.51,  $p<.0001$ ). In Phase 1 and Phase 2, there were significant differences between male and female art preferences, with 66% of males as compared to 55.59% of females who preferred nature art over other art images. All three art intervention groups were equally represented, so results from the study were not confounded by an imbalance of groups.

Least square means (LSM) differences for art preference comparing Phase 1 and Phase 2 across all age groups indicated representational, nature as the preferred art image (Phase 1:  $M=62.61$ ,  $SD=15.62$ , Phase 2:  $M=64.82$ ,  $SD=9.15$ ). There was a difference between phases for the second preferred art image. In Phase 1, impressionistic art was favored second highest ( $M=17.89$ ,  $SD=11.49$ ), with chaotic abstract as second preferred for subjects in Phase 2 ( $M=10.95$ ,  $SD=16.71$ ). Refer to Table 3.1.

**Table 3.1** Preference (percentage and standard deviations) of respondents from four age groups for different art types

Art Code	PHASE 1		PHASE 2		Mean ‡
	Mean †	SD	Mean †	SD	
Abstract, chaotic	8.38	9.46	10.95	16.71	9.67b
Abstract, w/ strong color	6.84	7.98	5.13	7.11	5.99bc
Abstract, w/ animal	4.27	6.83	7.81	12.29	6.04bc
Impressionistic	17.89	11.49	8.78	9.96	13.33b
Abstract, calm color	0.00	0.00	2.50	7.07	1.25c
Nature	62.61	15.62	64.82	9.15	63.72a

† Averaged across art groups and Phase 1 and Phase 2.

‡ Averaged across age groups, Phase 1 and Phase 2, and genders. Means followed by the same letter are not significantly different from each other based on the 0.05 probability level using the Least Significant Difference test

LSM differences for favored art images within each of the specific age groups were analyzed, and consistent preference across all age groups for nature were found ( $p < .0001$ ). There was no significant difference between Phase 1 and Phase 2 in preference for representational, nature. Using the LSM to compare favored art images among the four age groups with combined data from both phases, findings indicate a significant difference in art preference based on age group ( $p = > 0.05$ ) (refer to Table 3.2).

**Table 3.2** Preference (percentage and standard deviations) of respondents from four age groups for different art types

Art Code	5 to 7 yrs.		8 to 10 yrs.		11 to 13 yrs.		14 to 17 yrs.		
	Mean †	SD	Mean †	SD	Mean ‡	SD	Mean †	SD	Mean ‡
Abstract, chaotic	14.22	14.71	18.96	17.75	0.00	0.00	5.49	6.89	9.67b
Abstract, w/ strong color	11.95	8.33	3.57	7.14	1.92	3.85	6.51	7.59	5.99bc
Abstract, w/ animal	6.07	7.01	1.19	2.38	12.50	15.96	4.41	8.82	6.04bc
Impressionistic	13.60	10.56	7.14	8.25	16.35	13.62	16.24	14.51	13.33b
Abstract, calm color	0.00	0.00	0.00	0.00	0.00	0.00	5.00	20.68	1.25c
<b>Nature</b>	<b>54.17</b>	<b>8.67</b>	<b>69.14</b>	<b>6.18</b>	<b>69.23</b>	<b>5.13</b>	<b>62.34</b>	<b>10.00</b>	<b>63.72a</b>

† Averaged across genders and Phase 1 & Phase 2.

‡ Averaged across genders, Phase 1 & Phase 2, and art groups. Means followed by the same letter are not significantly different from each other based on the 0.05 probability level using the least significant difference test.

Within the 5 to 7 age group, 51.1% ( $M=54.17$ ) preferred nature, compared to 71.2% ( $M=69.14$ ) in the 8 to 10 age group, 70.3% ( $M=69.23$ ) in the 11 to 13 age group, and 57.1% ( $M=62.34$ ) in the 14 to 17 age group. A comparison using LSM was used to determine art preference by category between genders (refer to Table 3.3). There was a significant difference between all females versus males ( $p=0.05$ ). Sixty-nine percent ( $M=70.65$ ) of all males preferred nature art as compared to 55.59% ( $M=56.78$ ) of all females. Twelve percent ( $M=10.62$ ) of males preferred chaotic abstract, versus 6.5% ( $M=8.71$ ) of females. Six percent ( $M=4.95$ ) of males preferred abstract art with strong color (bird abstract), compared to 7.5% ( $M=7.02$ ) of females. One percent ( $M=2.08$ ) of males preferred animal abstract art (cat abstract), compared to 9.7% ( $M=10.00$ ) of females. Ten percent ( $M=9.19$ ) of males preferred impressionistic art as compared to 20.4% ( $M=17.48$ ) of females. Based on the number of variables examined, the level of statistical significance was  $p<0.001$  (refer to Table 3.3).

**Table 3.3** Preference (percentage and standard deviations) of female and male respondents for different art images

Art Code	FEMALE		MALE		Mean ‡
	Mean †	SD	Mean †	SD	
Abstract, chaotic	8.71	13.74	10.62	13.48	9.67b
Abstract, w/ strong color	7.02	7.70	4.95	7.35	5.99bc
Abstract, w/ animal	10.00	11.59	2.08	5.89	6.04bc
Impressionistic	17.48	13.40	9.19	7.73	13.33b
Abstract, calm color	0.00	0.00	2.50	7.07	1.25c
<b>Nature</b>	<b>56.78</b>	<b>12.09</b>	<b>70.65</b>	<b>8.63</b>	<b>63.72a</b>

†Averaged across art groups, and genders. ‡Averaged across age groups,

Phase 1 & 2, and genders. Means followed by the same letter are not significantly different from each other based on the 0.05 probability level using the Least Significant Difference test

### 3.3.4 Data Analysis: Phase 3: Pilot Study of Health-related Effects

Nonparametric chi-square analyses were performed to evaluate whether there were significant differences between gender groups, groups exposed to different art images, and age groups at Time 1 (T1) and Time 2 (T2). Time 1 refers to first-time data obtained from patients upon admittance to hospital room; Time 2 refers to second-time data obtained two hours after Time 1. All three groups were equally represented, so results from the study were not confounded by an imbalance of groups.

Comparing all psychophysiological data across both T1 and T2, there were no significant differences between the gender, art, or age groups. Even within the

nature art group, there were no significant differences between genders, art images, or age groups (n=5 males, n=15 females). Chi-square analyses were performed, with results indicating that within the abstract art group there was a significant difference between genders in their psychophysiological responses (n=16 males, n=15 females) ( $X^2 = 3.857, p < 0.05$  and two teachers, school principals, and nursery school). Within the no art group, there was no significant difference in psychophysiological responses.

Between age groups, there were no significant differences in the 5 to 7, 11 to 13, or 14 to 17 age groups. Yet there was a significant difference in gender in the 8 to 10 age group (n=12 males, n=4 females) ( $X^2 = 4.000, p = 0.046$ ). Significantly more males than females were positively affected by exposure to nature art, demonstrated by positive changes in PFM scores, blood pressure, and respiratory rates between T1 and T2. One-way analyses of variance (ANOVAs) were performed to compare each of the three art intervention groups (nature, abstract, and no art) within each of the four individual age groups (based on PFM, blood pressure, and respiratory rate). The independent variables were the individual art intervention group; with the present functioning module, blood pressure, and respiratory rate scores being the dependent variable. For T1 the whole set of data was analyzed to test for pre-existing differences in the groups prior to exposure to the art intervention.

There were significant differences with parent's response on scores for *angry* ( $F(2, 67) = 3.238, p = 0.045$ ) for the parent PFM abstract art intervention group (n=21,  $M = 55.00, SD = 22.53$ ). In T1, the results from the parent PFM indicated that there was an

emotional functioning rating difference even before the pediatric subjects were exposed to the art intervention. The abstract art group performed better on the emotional functioning ratings than did the nature art group before the patients were exposed to abstract art images.

Measurements for T1 ratings were taken to test for individual differences at T1, indicating that there were no significant differences in blood pressure and respiratory rates of pediatric patients between T1 and T2. In T2, there were no significant differences, except in the child PFM abstract art group ( $n=21$ ) on rating score for *worry what will happen to me* ( $M=42.62$ ,  $SD=35.38$ ). The abstract group rated this category of *worry* higher, as compared to the nature art group.

In T1, in the 5 to 7 age group, parents rated the *pain* score higher when exposed to the abstract art. There were significant differences in parents' rating for *pain* ( $F(2, 15) = 9.46$ ,  $p=0.002$ ) on the Parent PFM for abstract art image exposure ( $n=7$ ), as compared to the nature art image ( $n=4$ ). Comparing the abstract art image ( $M=70.71$ ,  $SD=25.07$ ) to the nature image ( $M=3.75$ ,  $SD=4.79$ ), the mean and standard deviation were much higher.

For this parent PFM rating, the abstract art group ( $n=7$ ,  $M=46.00$ ,  $SD=0$ ) scored significantly worse than the nature art group ( $n=4$ ,  $M=3.75$ ,  $SD=4.79$ ) before they were exposed to art images. In T1, for the 14 to 17 age group, there were significant differences in ratings for diastolic blood pressure, with the nature art group ( $n=6$ ,  $M=125.17$ ,  $SD=6.21$ ) performing worse than the no art group.

Quality of life, based on PFM scores, blood pressure, and respiratory rates, tended

to improve over time. To test the differences at T2 while controlling for T1, a repeated measures ANOVA was performed with the findings.

Due to the exploratory nature of this study and since there were no highly significant results, paired t tests were performed to examine more closely the pattern of data within each age and art-exposure group. Repeated-measures t test compared within subjects (nature, abstract, and no art groups) between T1 and T2 revealed no consistent effect for art exposure on PFM scores, blood pressure, or respiratory rates, but rather a general trend of functional improvement on these measures associated with the passage of time between T1 and T2, regardless of art exposure (refer to Tables 3.4 and 3.5).

**Table 3.4** Pearson correlation coefficients between PedsQL TM PFM: T1 Patient Self-Report T2 Above the Diagonal  
Parent Proxy Report T2 Below the Diagonal  
Patient Self-Report/Parent Proxy Report Correlations on the Diagonal

	<b>Totals</b>	<b>Sad</b>	<b>Anxiety</b>	<b>Anger</b>	<b>Worry</b>	<b>Fatigue</b>	<b>Pain</b>
Total	<u>.446**</u>	.678**	.707**	.482**	.782**	.550**	.889**
Sadness	.748**	<u>.335**</u>	.510**	.344**	.559**	.044*	.351**
Anxiety	.754**	.465**	<u>.412**</u>	.381**	.476**	.121	.478**
Anger	.564**	.396**	.443**	<u>.194</u>	.348**	.087**	.227
Worry	.765**	.633**	.464**	.308**	<u>.380**</u>	.264*	.385**
Fatigue	.673**	.298**	.383**	.114	.459**	<u>.193</u>	.367**
Pain	.763**	.486**	.469**	.400**	.405**	.440**	<u>.383**</u>

Note: Correlations between patient self report and parent proxy report are in blue. \*p<.05, \*\*p<.01 (two-tailed)

**Table 3.5** Pearson correlation coefficients between PedsQL TM PFM: T2  
 Patient Self-Report T2 Above the Diagonal  
 Parent Proxy Report T2 Below the Diagonal  
 Patient Self-Report/Parent Proxy Report Correlations on the Diagonal

	<b>Totals</b>	<b>Sad</b>	<b>Anxiety</b>	<b>Anger</b>	<b>Worry</b>	<b>Fatigue</b>	<b>Pain</b>
Total	<u>.664**</u>	.698**	.748**	.396**	.820**	.692**	.811**
Sadness	.788**	<u>.528**</u>	.492**	.131**	.594**	.272*	.459**
Anxiety	.799**	.626**	<u>.425**</u>	.299*	.615**	.246*	.535**
Anger	.587**	.365**	.409	<u>.557**</u>	.221	.155	.254*
Worry	.799**	.751**	.546**	.390**	<u>.597**</u>	.446**	.465**
Fatigue	.749**	.459**	.485**	.212	.520**	<u>.604**</u>	.604**
Pain	.740**	.379**	.537**	.382**	.388**	.536**	<u>.599**</u>

Note: Correlations between patient self report and parent proxy report are in blue.

\*p<.05, \*\*p<.01 (two-tailed)

## CHAPTER IV

### CONCLUSIONS AND RECOMMENDATIONS

#### 4.1 SUMMARY OF RESEARCH

With the growing number of children's healthcare facilities being constructed and renovated, it is vitally important to understand environmental elements that promote stress reduction and contribute to the well-being of pediatric patients. Because a great number of pediatric patients spend long periods of time in hospital settings, they may be particularly susceptible to the effects of the physical environment in the healthcare setting. Since psychologically appropriate art, as an environmental element, potentially possesses such benefits of stress reduction, thus healing, it is important to understand what type of art children prefer and what contributes to healing. Thus, children may benefit both psychologically and physiologically if art is infused into the healthcare setting. In the review of literature on the effects of the healthcare environment on patients' medical outcomes, it was apparent that certain design elements might affect stress-reduction and patients' well-being. The review of literature confirmed the importance of stress reduction in the designed environment through exposure to nature. Support was also provided for the positive effect of visual distractors in reducing pain and stress in pediatric patients. The literature review confirmed that children psychologically and physically progress through various developmental stages, with environmental needs and preferences changing through their perception of pain

and anxiety in order to better design healthcare environments. In addition, nature has been shown to have a variety of positive influences on children and adolescents, including the potential ability to contribute to the healing effects in healthcare. Yet there is a lack of previous research on how the environmental elements in the hospital affect children's and adolescents' well-being. The review of literature confirmed that the positive distraction theory with pediatric patients has been shown to reduce pain perception. Thus, the researcher anticipated that the art intervention would serve as a positive distraction. But based on the literature review, pediatric patients responded to direct, (rather than indirect) focused forms of positive distraction that reduced pain perception (Sparks, 2001). The art image intervention was not an isolated, focused form of positive distraction. So it clearly did not have the same effects as other visual distractors, such as a kaleidoscope that was found to significantly reduce venipuncture pain in children ages 3 to 12 years (Vessey, Carlson, & McGill, 1994). The purpose of the three-phase study was to examine the art preferences of school children and pediatric patients, as well as to measure the psychophysiological responses of the hospital patient as a result of art intervention. Results from this study may contribute to greater understanding by healthcare designers of the need for age- appropriate art that children prefer that will enhance the pediatric patients' hospital experience.

## 4.2 SUMMARY OF FINDINGS

Representational, nature art was clearly indicated as the highest preferred art image for all age groups, as revealed by study results from Phase 1 and Phase 2. Overall in all four age groups in Phase 1, 66% preferred representational, nature art. In Phase 2, representational, nature art was preferred by 60% of the older three age groups and by 50% of the 5 to 7 age groups. These results support hypothesis #3, that there would be no difference between preferences of school and hospitalized children and adolescents who preferred representational, nature art to abstract. A preference for realism has long been noted in the literature. Consistent with study results of Ramsey (1982), the majority of elementary school children preferred realism to abstract art images. According to study results of Sebba (1991), children's favorite remembered places indicated nature-outdoors as the most significant environment by 95.6% of males and females. Seventy percent of the adolescent subjects in Owen's (1988) study valued outdoor places where they could be with nature. Phase 1 and Phase 2 results for nature preference were consistent with Hart's study of 1979, in which nature was the choice destination where children sought out quiet places to be alone to replenish their psychological and physiological well-being.

In Phase 1, there was not a dramatic gender difference in art preferences between age groups, except in the 14 to 17 age group, in which more males ( $n=10$ ) preferred the representational, nature art image, as compared to females ( $n=6$ ). This partially

supported hypothesis #2 which stated that “gender will impact art preferences.” In Phase 2, there was also not a major gender difference in art preference. Sixty-nine percent of all males preferred nature art, as compared to 55.59% of all females, with 20.4% of females preferring impressionistic art as compared to 12% of males. Consistent with the literature review on children’s preference for nature, the outdoors was most often indicated as the most significant environment in their childhood by 95.6% of both males and females (Sebba, 1991). In this study, preferences were shown to be gender-related, with boys preferring the outdoors and girls preferring indoor locations. Girls’ indoor place preference could be based on increased preference for social interaction from 8 to 11 years of age, due to developmental differences between boys and girls. So these findings could be generalized to assume that socialization could have a greater impact on preferences for interaction and psychological support than specific environmental factors such as art.

Based on cognitive developmental stages, children’s art preferences remained consistently in favor of nature. This proved inconsistent with hypothesis #1, which stated that “distinct differences in art preferences would exist among four cognitive developmental age groups,” and hypothesis #4, which stated that “younger children (5 to 10 years of age) will prefer nature, with older children (11 to 17) preferring more abstract art as a function of their cognitive developmental stage.” Based on Piaget’s (1930) theory of cognitive development, the researcher anticipated that children’s cognitive development would affect their art preference. Hypotheses #1 and #4 were proved to be unsupported, as children’s preferences remained the same over the four age

groups, and cognitive development appeared to have no impact on art preference. Phase 3 study results for psychophysiological measures from the PFM, blood pressure, and respiratory rates did not support hypothesis #5, in which nature art which was expected to have therapeutic benefits of healing. There were no differences in physiological measures between the two art interventions of nature versus abstract art. These findings with pediatric patients were inconsistent with the literature on adult hospital patients, where views of nature and nature art were therapeutic in contributing to positive health outcomes (Heerwagen & Orians, 1990, Ulrich, 1984, 1991, 1993, 1994, Ulrich & Simons, 1986). The researcher had anticipated that pediatric patients would respond similarly to adult patients, with nature art proving to have positive physiological outcomes.

It is important to note that the study methodology was not designed to control for any intervening variables, e.g. separating out differences among three art groups on PFM scores, blood pressure, or respiratory rates. A possible explanation for the lack of significant psychophysiological differences among the three art intervention groups is the comparatively long duration of art exposure between T1 and T2. The strength of the study is that there are no missing data.

The researcher anticipated that the art intervention would serve as a positive distraction to reduce stress. The review of literature confirmed that the positive distraction theory with pediatric patients has been shown to reduce pain perception. But based on the literature review, pediatric patients responded to direct, focused forms of positive distraction that reduced pain perception (Sparks, 2001). The art image

intervention was not an isolated, focused form of positive distraction. So it clearly did not have the same effects as other visual distractors, such as a kaleidoscope that was found to significantly reduce venipuncture pain in children ages 3 to 12 years (Vessey, Carlson, & McGill, 1994). The literature review revealed that due to immature cognitive processes, young children did not possess the conceptual skills required to use focused distraction techniques (Hurley & Whelan, 1988).

### **4.3 SUMMARY OF RECOMMENDATIONS**

Pediatric patients may be less in tune with art and more affected by social support, such as child life advocates and parental care. Both pediatric units were very child friendly, providing a high level of social support. In addition, patients were not in an isolated environment, as adult patients often are. Pediatric patient hospital care also is not the same as hospital care for adults. In a typical pediatric unit, there is much more social support and positive diversion, such as art activities. So, maybe the difference between data results was due to the high levels of social support for pediatric patients as opposed to that for adult patients. It is important to recognize that children cannot be considered as “little adults,” assumed to respond in ways that adults might respond to their surroundings. The study findings indicated children and adolescents prefer nature art, but hospitalized pediatric patients clearly respond more to social support.

Perhaps a sample group that examines high anxiety that will remain high over time would be a better study group to provide significant results. An example might be cardiac

patients, a similar sample group to that of the Ulrich, et al. (1993) study with cardiac patients who viewed a nature and an abstract art image in their hospital rooms. The advantage of this study was that there were not any subgroup analyses in the sample group of patients who were considered to experience higher anxiety and maintain anxiety over time. Even highly anxious patients across all diagnostic fields exhibited reduced anxiety. Based on what we have learned from this study, choice is an important option for children in placing art in their hospital rooms. It is highly recommended that children have a choice in art placed in their hospital rooms. One optimal recommendation would be to provide for an art cart that would provide several options for patients to select a preferred picture to place in their room, although most choices should be nature.

#### **4.4 LIMITATIONS OF STUDY**

##### **4.4.1 Sample Size**

The study has various shortcomings that work against validity. One is the small effect based on the small sample size ( $n=70$ ) in Phase 3, split into four sample groups. The sample sizes were slightly smaller than the recommended size of 30 or more per group (Bollen, 1989). To generate larger power, to detect a real difference among study groups, there needs to be a larger sample group to detect small differences.

##### **4.4.2 Diagnoses of Patient Group**

The study was conducted in the pediatric unit, where there was a general diagnostic patient group, so there was no way to control for physical health conditions.

If patient groups had been exposed to a common stressor, there would have been control over the study conditions. Findings from physiological measures (blood pressure and respiratory rates) did not provide a pattern of convincing evidence that the environmental conditions had significantly different effects on stress. There was no significant evidence to support the interpretation that stress was lower during exposure to nature rather than abstract or no art, in accordance with other research on adults that exposure to nature can reduce stress.

#### **4.4.3 PedsQL™ Present Functioning Module (PFM)**

The PedsQL™ PFM measurement instrument assessed patient psychological and physiological ratings as it was designed to do. Over the 2-hour period between T1 and T2, the pediatric patients improved, so there was not a clear effect of one art image over the other. Newly admitted patients are anticipated to experience anxiety, which is consistent with the research data (Clatworthy, Simon, & Tiedeman, 1999, Tiedeman & Clatworthy, 1999). Measurements performed as hypothesized: respiratory rate and blood pressure measurements improved over time. But the art intervention did not produce the hypothesized results. The researcher had hypothesized that the physiological and emotional measurements would show a positive improvement based on nature art intervention and that the same measures would reveal negative improvements when patients were exposed to the abstract art image. But results from both groups showed emotional and physical improvements over time.

#### 4.5 FUTURE RESEARCH

The researcher hopes that this study encourages further research in exploring the links between the environment and pediatric patients' well-being in the healthcare environment. There were intervening variables in this study, which prohibited the researcher from controlling all the elements of the physical environment. There may have been benefits during the first 10 to 20 minutes, but maybe they waned over the 2-hour period between T1 and T2. A study design that could more effectively isolate and independently analyze the numerous environmental elements, such as color, lighting, and furniture styles, could provide more in-depth and insightful design guidelines. With this being the first study ever conducted on art and pediatric patients, there is great need for replication of this study under different and/or more stringent conditions that could control outcomes more effectively.

#### 4.6 CONCLUSIONS

In an interdisciplinary manner this study expands our understanding of the relationship between children and their environment. Although studies of place use and preference by environmental psychologists have not addressed the effects of cognitive development on environmental preferences, developmental psychopathologists have seldom considered the impact of children's emotions on their interactions with large-scale environments (Thurber & Malinowski, 1999). The results of this study illustrate the benefits of collaboration among the disciplines of interior design, architecture, and environmental psychology, and suggest that previously unidentified developmental

implications of children can affect their responses to environmental elements such as art. Since the psychological and physiological well-being of children in healthcare settings is extremely important in contributing to the healing process, it is vitally important to identify elements in the environment that support stress reduction. Because art contributes to the environmental enrichment of the healthcare environment, it is important to understand what type of art children prefer. The study results could contribute to practice and research in the discipline of the environmental planning and research of pediatric healthcare settings in two ways. First, the results from Phase 1 and Phase 2 can provide design practitioners, facility managers, and policy-makers guidelines for designing environments that children and adolescents prefer. Second, design practice achieves a quality of patient satisfaction and, ultimately, restorativeness. Results determined that children prefer representational, nature art over abstract art, thus this preferred art should provide positive psychological benefits to the hospitalized patient.

Through infusion of appropriate art images in pediatric environments, patients frequently experiencing stress in healthcare settings will have more opportunities to feel at ease. If the well-being of patients can be increased, the billions of dollars spent on healthcare costs can be reduced. Although there are many studies that validate patient-focused design in healthcare settings, the vast majority is intuition-based, reflecting adult preferences and not what children prefer. With the growing number of children's hospitals there is a greater need for patient-validated expressions of art preference by the children themselves.