

PERCEPTIONS OF THE NURSE'S ROLE BY HOSPITALIZED CHILDREN  
WITH CHRONIC CONDITIONS:  
A NEO-PIAGETIAN INVESTIGATION

by

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## ABSTRACT

This study investigated the relationship between cognitive development and children's understanding of the hospital nurse's role. A group of 35 hospitalized children with chronic conditions and without neurological deficits, aged 4 to 10 years, were given three tasks (i.e., the Nurse's Role Task, the Balance Beam Task, and the Task of Intrapersonal Understanding), scored for developmental level using Case's (1992) neo-Piagetian theory of cognitive development as a framework. A full sample of 4-year-olds was not pursued due to the distracting hospital environment which, in combination with the shorter attention span of the 4-year-olds, rendered the interviews extremely difficult to complete. Descriptive results indicated a moderately advanced understanding of the hospital nurse's role by 8- and 10-year-olds, being on the order of one-third of a substage (i.e., approximately 8 months ahead in development), whereas 4- and 6-year-olds showed an age-appropriate level of understanding of the hospital nurse's role. Analysis of Variance indicated a statistically significant effect for age on all three tasks ( $p < .01$ ). Six levels of social-cognitive development in understanding the hospital nurse's role were found, which were, in successive order: (1) Roles of the nurse as scripted actions (i.e., 4-year-old level), (2) Roles of the nurse as

motivated action sequences (i.e., 6-year-old level), (3) Roles of the nurse as planned action sequences (i.e., 8-year-old level), (4) Roles of the nurse as generalized dispositions toward action (i.e., 10-year-old level), (5) Roles of the nurse as demonstrating logically planned decisions towards action (i.e., 12-year-old level), and (6) Roles of the nurse as demonstrating logically planned action sequences (i.e., 14-year-old level). Furthermore, results indicate that a few 6- and 8-year-olds and the majority of 10-year-olds could give an accurate description of the duties of the hospital nurse, that is, 1) nurses are there to help children, 2) nurses have a responsibility for the well-being of their patients, 3) nurses want to improve the physical and emotional health of their patients, 4) nurses also see their own shortcomings in their care for children and have good intentions, and 5) nurses are human and have their own feelings, thoughts, doubts, and ideas.

Suggestions for future research have been provided in order to further improve communication between health care professionals and hospitalized children with chronic conditions.

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## CHAPTER I

### INTRODUCTION

The main issue examined in this research is the question of what kind of influence direct and prolonged exposure to hospitals and medical procedures, such as is experienced by children with chronic or long-term health conditions, has on these children's conception of the hospital nurse's role. Case's (1992) neo-Piagetian theory of development was used to analyze this issue.

Cognitive-developmental studies that have been done so far have been concerned primarily with the specific and unique ways in which children conceptualize causes of illness (Bibace & Walsh, 1980; Brewster, 1982; Brodie, 1974; Campbell, 1975; Neuhauser, Amsterdam, Hines & Steward, 1978; Perrin & Gerrity, 1981; Potter & Roberts, 1984). Most of these studies suggest that children's concepts of illness develop through a systematic and predictable sequence of developmental stages, such as those described by Piaget (1929), ranging from the global and phenomenological concepts characteristic of preoperational thought to the more sophisticated psychophysiologic concepts characteristic of formal operational thought (Bibace & Walsh, 1981).

Only a few studies included the child's understanding

of the role of medical personnel (Brewster, 1982; Haight, Black & DiMatteo, 1985; Redpath & Rogers, 1984).

Piagetian stage theory appears inadequate to explain the child's conception of role for several reasons. First, if we look at the few studies that examined the child's conception of medical personnel (e.g., Brewster, 1982; Redpath & Rogers, 1984), the age ranges used to interpret the data are too broad. According to Piagetian theory, a child's perception of medical personnel is basically the same from age 7 till 10. Case's (1992) neo-Piagetian theory, however, subdivides one stage into three substages and details changes in children's thinking from age 7 to 10, allowing for a more detailed analysis of the data.

Second, Piagetian Stage Theory is considered to be too monolithic to explain the child's conception of role (Case, 1992). Piaget saw the child as a young intellectual, structuring the world around him/her by applying a set of logical tools of increasing generality and power. These tools were understood as being logico-mathematical operations that were universal in nature and applicable to a wide variety of tasks. Piaget did not see children's understandings in different domains as being determined to a major extent by their domain-specific experience. Instead, Piaget interpreted children's understanding by the general set of operations that they applied to their experience, and the general set of auto-regulative processes by which these

operations were gathered into stable systems or groups (Case, 1992). Therefore, Piaget neglected the fact that children's intellectual development is dependent on the culture in which they are raised, the amount of instruction they receive and their individual learning history. Hence, he overlooked the influence of the child's personal experience on his/her cognitive development. A child with a chronic condition who has experienced multiple hospitalizations is assumed to have a different individual learning history than a child who has never been hospitalized before. The individual learning history of the child with a chronic condition might influence development within a specific domain.

Case (1992) hypothesizes a number of "central conceptual structures" to account for domain-specificity in development. Different domains demand different executive control structures to solve different sorts of problems. The specific executive control structures for each domain form the basis for a central conceptual structure. The child's conception of role, in this study the hospital nurse's role, is considered to be part of the social-cognitive domain (Goldberg-Reitman, 1992). This social-cognitive domain has its own underlying "central conceptual structure" to represent social understanding.

Third, the fact that Piaget, contrary to Case, does not acknowledge the influence of different learning experiences



within each domain makes it impossible to look at what impact emotions have on the child's cognitive development. Case, Hayward, Lewis, and Hurst (1988) have suggested that, in contrast to certain psychoanalytic theories, chronic internal conflict and anxiety will lead only to a very modest deceleration in children's normal rate of cognitive growth. They even suggested that many specific situations that are emotionally disturbing for the child might actually lead to an acceleration of children's cognitive growth in the relevant domains. Therefore, the cognitive development of a child with a chronic condition might actually be advanced in the area of understanding of the nurse's role, because of more frequent exposure to hospitalization and medical treatments.

There is little research on the child's perception of the hospital nurse's role. Brown and Ritchie (1990) described how nurses perceive parent and nurse roles in caring for hospitalized children but not how children understand the role of the hospital nurse. The few studies that examined the child's understanding of the role of medical personnel (Brewster, 1982; Eiser, 1989b; Haight et al., 1985; Redpath & Rogers, 1984) mainly focus on the role of doctors and nurses in general without defining their specific functions. Brewster (1982) is the only author that included a wide age-range (5- to 12-year-olds), which makes it possible to examine developmental change. The role of

the hospital nurse was just a small part of her study and the data she provided about the role of the nurse is very general.

No "neo-structural" analysis has been done in the area of conception of the hospital nurse's role by children with long-term health conditions. In other words, no analysis is reported that uses the finer grained classification system neo-Piagetian theory provides. Since Goldberg-Reitman (1992) looked at different aspects of the young girl's perception of the mother's role by using Case's theory, her study was used as a basis for interpreting possible developmental trends in the understanding of the hospital nurse's role of children with chronic conditions. The mother role and hospital nurse role show similarities in the sense that some of the mother's functions are temporarily taken over by the nurse during some periods of the child's hospitalization. The nurse may be the one who provides some nurturance for the child when he/she is upset or may protect the child when he/she feels ill. Furthermore, the nurse prepares and instructs the child for medical procedures and cares for the child's physical well-being. These four functions are normally done by the mother or father if she/he is the adult primarily present during the hospitalization.

#### Research Objectives

Two general objectives form the basis for the study:

1. To conduct a developmental analysis of perceptions of the hospital nurse's role by children with chronic health conditions, within the framework hypothesized by Case (1992).
2. To examine the influence of exposure to hospitalization and/or medical treatments on the child's understanding of the hospital nurse's role.

#### Importance of the Study

There are several reasons why children's conceptions of the hospital nurse's role need to be examined. First of all, the research that has been done on children's understanding of medical personnel's roles has frequently used faulty methodology. Burbach and Peterson (1986) point to inadequate descriptions of samples, instruments and procedures, observer bias and expectance effects, control of confounding variables and issues of questionnaire reliability and validity as general shortcomings in studies of children's understanding of medical roles. Therefore, a clearer outline of the specific and unique ways in which children perceive the roles of medical personnel over the course of cognitive development is needed.

According to Eiser (1989a), research concerned with children's conceptions of health and illness has been heavily based on interview data and has paid little attention to the reliability and validity of the interview schedules. The few studies (Brewster, 1982; Haight et al.,

1985; Redpath & Rogers, 1984) that not only focused on the child's perception of illness, but also examined the role of medical personnel, provided limited data. Haight et al., for example, examined only 4- and 5-year-old children and Redpath and Rogers restricted their study to preschoolers and second graders. Brewster included several age groups in her study (ages 5 to 12), but provided poor task description and global summaries of the data.

The second reason why it is important to examine children's perceptions of the hospital nurse's role is because of the criticism of the theoretical underpinnings of children's conceptions of illness, and the nurse's role in particular (Eiser, 1989a, 1989b). The majority of previous studies rely on Piagetian Stage Theory, which appears to be limited considering the shift that has taken place in the various developmental "schools of thought." For example, Stage Theory is generally criticised for its failure to explain how the transition from one stage to another occurs, and for the assumption that children develop within a vacuum, with little acknowledgement of the role of experience or social or cultural factors (Nelson, 1986).

Third, a better understanding of children's conceptions of the nurse's role can be used to facilitate or improve the services currently offered by paediatric health care professionals. For example, Perrin and Perrin (1983) emphasized the lack of accuracy of medical personnel in

estimating the age at which children give developmentally characteristic answers to a series of questions about illness and made clear that a better understanding of the child's development by medical personnel will improve the medical treatment of the child.

Fourth, Garbarino and Stott (1990) emphasized the important role the nurse plays for the hospitalized child. Nurses temporarily take over the mother's role to a certain extent and may interact with the child more than the mother during a hospital stay. According to Garbarino and Stott, the hospital nurse's role consists not only of a technical or clinical component, but also of an affective, nurturing component. Brown and Ritchie (1990) stated that nurses' perceptions of parent and nurse roles in caring for hospitalized children show many similarities. For example, both parents and nurses provide psychosocial care, such as nurturance and emotional support.

Health education is another important role played by the hospital nurse (Whaley & Wong, 1991). Health education involves informing parents and children about condition-related matters and their treatment, encouraging children to ask questions about their bodies, referring families to health-related professional groups, and supplying patients with appropriate literature. According to Garbarino and Stott (1990) optimal understanding of the child's perception of the hospital nurse's role is required for the nurse.

Therefore, it is important to examine children's concepts of the hospital nurse's role in more depth.

### Definition of Terms

The following terms will be used throughout the thesis and are defined below.

#### Central Conceptual Structure:

A central conceptual structure is an internal network of concepts and conceptual relations that plays a central role in permitting children to think about a wide range of situations at a new epistemic level and to develop a new set of control structures for dealing with them. (Case, 1992, p.130)

Furthermore, central conceptual structures can be applied to a wide range of content, but only within a specific domain (Case & Griffin, 1990). Consequently, within each domain specific central conceptual structures will be constructed by the child.

Structure: Case (1992) states, "By a 'structure' we mean an internal mental entity that consists of a number of nodes and the relations among them" (p. 130).

Conceptual: "By 'conceptual' we mean that the nodes and relations are semantic: that is, they consist of 'meanings', 'representations', or 'concepts' that the child assigns to external entities in the world, rather than syntactic devices for parsing such meanings (Case, 1992, p.130)."

Central: By central Case (1992) means "structures that (a) form the core of a wide range of more specific concepts and (b) play a pivotal role in enabling the child to make

the transition to a new stage of thought, where these concepts are of central importance (p.130)."

Executive Control Structures: Case (1987) described executive control structures as comprising three components:

(1) a representation of a particular set of recurrent environmental features, (2) a representation of the goals and subgoals that are most typically occasioned when these features are present, and (3) a representation of the sequence of operations (i.e., strategy) which gradually emerges, as a means for achieving these goals and subgoals. (p. 782)

Chronic or Long-Term Health Condition:

A chronic condition is any anatomical or physiological impairment that interferes with the individual's ability to function fully in the environment. Chronic conditions are characterized by relatively stable periods that may be interrupted by acute episodes requiring hospitalization or medical attention. The individual's prognosis varies between a normal life span and unpredictable early death. Chronic conditions are rarely cured, but are managed through individual and family effort and diligence. Chronic illness, long-term illness, and chronic condition are terms often used interchangeably in the literature (Thomas, 1987, p.5).

Whaley and Wong (1991) define chronic illness as "a condition that interferes with daily functioning for more than three months in a year, causes hospitalization of more than one month in a year, or (at time of diagnosis) is likely to do either of these" (p.993).

Perrin, Newacheck, Pless et al. (1993) recommend that a chronic condition should be described as follows:

Ideally, a definition should be comprehensive, generic, and flexible. We believe that a two-level approach to defining chronic conditions satisfies these criteria. For the first, most inclusive level, duration alone is the decisive consideration. We recommend that a condition be considered chronic if it has lasted or is

expected to last more than 3 months. A second level attends to the further specification of a condition. We recommend that the second level of a broad definition takes into account the impact of a condition on the child. For example, the level of functional impairment or the use of medical attention greater than that expected for a child of the same age might be considered in adopting a working definition for service or research applications (p. 792).

Perrin, Newacheck, Pless et al.'s definition was adhered to by the researcher in the current study.

Approximately 15-20% of children have a chronic condition (Olson, Johansen, Powers, Pope, & Klein, 1993). Examples of chronic conditions are asthma, cystic fibrosis, diabetes, sickle-cell anaemia, orthopaedic disorders, spina bifida, haemophilia, rheumatic fever, and cancer.

Exposure to hospitalization and/or medical treatment:

It is expected that a child with a chronic condition will be exposed to medical treatments, such as doctor's appointments, hospital visits, daily medical treatments, medical assessments, tests and diagnosis, and possible hospital admissions for at least one month in a year (Whaley & Wong, 1991). In their daily functioning they also might receive assistance from a local community health nurse.

Paediatric nurse's role:

The paediatric nurse's role includes family advocacy, illness prevention/health promotion, health teaching, support-counselling, therapy, coordination/collaboration, ethical decision making, research and health care planning (Whaley & Wong, 1991).



Literature pertinent to children's understanding of illness and health care will be reviewed in the following chapter.

## CHAPTER II

### REVIEW OF LITERATURE

Though relatively few studies have examined children's understanding of health care, particularly the child's conception of the hospital nurse's role, some authors have examined developmental changes in children's affective and cognitive responses to illness (Bibace & Walsh, 1980; Brewster, 1982; Brodie, 1974; Campbell, 1975; Neuhauser et al., 1978; Perrin & Gerrity, 1981; Potter & Roberts, 1984). These cognitive-developmental studies are relatively recent in origin (Burbach & Peterson, 1986). In the past, more studies were focused on the psychodynamic aspects of physical illness. A historical overview of both the psychodynamic and the cognitive-developmental approach will be given here to provide a framework for drawing possible parallels to children's understanding of the hospital nurse's role and for establishing the nature of developmental change. This will provide a background for using Case's (1992) theory of development.

#### Psychodynamic Studies.

Psychodynamic studies (Deutsch, 1942; Falstein, Judas & Mendelson, 1957; A. Freud, 1952/1977; Jackson, 1942; Jessner, Blom & Waldfogel, 1952/1977) emphasized the intrapsychic impact of illness. They described conceptions

involving mutilation, hostile acts, or castration with respect to treatments, anaesthesia, and surgery. The psychoanalysts explain children's conceptions of health and illness in terms of fear, deserved punishment and guilt (for a review, see Vernon, Foley, Sipowicz & Schulman, 1965). For example, Anna Freud (1952/1977) was of the opinion that children in the phallic phase (from approximately 4- to 6-years-old) tend to interpret surgery, no matter on what part of the body, as injury to the genitals. The Oedipus complex or Electra situation, depending on the gender of the child, can occur during this phallic-oedipal phase (S. Freud, 1908/1963). The child shows possessiveness of the parent of the opposite gender, and jealousy of and rivalry with the parent of the same gender. Often the child demonstrates exhibitionistic attitudes and castration anxiety.

Similar ideas relating castration fears or guilt feelings associated with masturbation and interpretations of hospitalization as injury or punishment have been shared by many other authors (Deutsch, 1942; Erickson, 1958; Jackson, 1942). Jackson (1942), for example, argued that even if the Oedipus complex ('Electra situation' for girls) is not completely accepted as an origin for fantasy fears, it may still be assumed that an extraordinary situation such as hospitalization may have an enormous impact on the child's newly found sense of physical self. Bergmann and A. Freud (1966), for example, suggest that children's behaviour

towards the surgeon should be understood in terms of their age-adequate emotions, drives, and internal conflicts. A child might respond to the surgeon in several ways. For example, the child might express fear of castration and mutilation towards the surgeon and see him/her as a punishing castrator. This is usually the case for boys during the Oedipal phase. The child might show passive dependence on the doctor because he/she is seen as the possessor of the child's body and a substitute for the parent. The child might express masochistic tendencies. This is especially the case with girls who have strong passive components. Or the child might look up to the doctor with total admiration. Consequently, the child will show heroic endurance of medical treatments.

The hospital experience can be a threat at this age when the child is forming a concept of him/herself as a physical being, is becoming identified with his/her own gender, and is concerned with his/her own limitations and capabilities.

According to the psychoanalytic perspective, therapeutic interventions should be oriented to the affective level and acknowledge these negative feelings, such as guilt and castration (A. Freud, 1952/1977). Anna Freud believed that fantasies aroused by a child's illness may negatively influence the child's cooperation with medical procedures, self-esteem, and successful adjustment

to the strain of both acute and chronic disease. For example, a young child after the toddler stage may be well able to understand the importance of medical treatment, to recognize the role of doctor or nurse as a beneficent one and the necessity for medicines no matter how they taste, but, according to Anna Freud, this understanding cannot be expected to last very long. The minute the visit to the doctor comes to a close, all reason disappears and the child gets overwhelmed by fantasies of castration or violent assault. Additionally, Anna Freud (1952/1977) stated that the response of a child to surgery does not depend on the type or seriousness of the operation which has been performed, but on the type and depth of fantasies aroused by it.

Anna Freud (1965) believed that a child in illness should be regarded and treated as potentially regressed, and that much of his/her age-adequate functioning may be reduced. Severe libidinal (also called sexual) and ego regression, that is, fantasies of mutilation, castration and/or violent assault, may be the result of psychic pain in traumatic situations, such as hospitalization and anxiety. During the whole period of growth, however, it has to be considered legitimate for children to revert periodically, to seek comfort and safety (especially in anxiety and distress) by returning to early forms of being protected and enjoying the symbiotic and preoedipal mother-child

relationship (A. Freud, 1965).

But, even within the psychoanalytic orientation, it became clear that feelings of the sick child were related to beliefs or concepts about illness and that these beliefs or concepts were related to the cognitive level of the child (Bibace & Walsh, 1981). Factors related to the child's stage of development and cognitive functioning were frequently mentioned in psychoanalytic studies (Chapman, Loeb & Gibbons, 1956; Fineman, 1958; Vander Veer, 1949). The negative feelings or affect of the sick child were seen to be in some way related to the child's cognition or understanding of the causes of the illness but, according to the psychoanalytic perspective, the child's cognition was mainly driven by underlying emotions which change over time. For example, children at the phallic or oedipal phase (approximately 4 to 6 years of age) are dominated by the intrusive mode and tend to explain injections, surgery, and other medical procedures as aggressive intrusions which might lead to fear of castration. They have a large residue of guilt derived from oedipal problems which leads to the interpretation of hospitalization as punishment (Erickson, 1958). Children in the latency phase (from approximately 6 to 10 years old) are more prone to the containment of their sexuality and consequently their fear of castration disappears (Kavka, 1962/1977). Around the age of twelve, when the ego is stronger, hospital treatment is no longer

fraught with terror.

The psychoanalytic view, however, was too limited to explain fully the variety of children's responses and to accentuate the developmental aspects of these responses. According to Bibace and Walsh (1981), it was too focused on distorted ideas about hospitalization and illness, and neglected the importance of the child's cognitive development. In contrast to the psychoanalytic approach, which has tried to account for children's conceptions of health and illness in terms of fear of punishment, the cognitive-developmental approach has its main focus on the degree of differentiation between self and others (Piaget, 1930/1960; Bibace & Walsh, 1981). Piaget (1930/1960), writing twenty years later than Sigmund Freud, focused not on physiological immaturity as Freud did but on the cognitive-structural system through which children transform incoming information. According to Piaget's stages, children have an increasing ability to separate internal realities such as wishes, needs, and thoughts from the outside world. For example, young children between 2 and 6 years of age are unable to distance themselves from their environment (Piaget, 1930/1960). Their explanations of illness are based on their immediate perceptual experiences (Bibace & Walsh, 1980). At the age of 11 years children will be able to differentiate between themselves and perceptual experiences completely.

Piaget's theory of cognitive development formed the base for many studies examining the child's conception of illness. In the next section the influence of Piaget's theory on studies that focused on children's conceptual development of illness will be discussed in more detail.

#### Cognitive-Developmental Studies

Cognitive-developmental studies have been focused mainly on the more specific and unique ways in which children conceptualize illness (Burbach & Peterson, 1986). Most of these studies suggest that children's concepts of illness develop through a systematic and predictable sequence of developmental stages, such as those described by Piaget (1929), ranging from the global and phenomenological concepts characteristic of preoperational thought to the more sophisticated psychophysiologic concepts characteristic of formal operational thought (Bibace & Walsh, 1981). Only a few cognitive-developmental studies, however, provided an overview of the development of children with chronic conditions (Perrin & Gerrity, 1984; Yoos, 1987)

In order to better understand the content of the different stages developed by Piaget (1929), a short overview of his theory will be given. According to Piaget, certain basic and well differentiated cognitive operations were acknowledged to be present at birth. These operations were considered to be relatively reflexive and independent in nature. However, they were not seen as remaining



independent for long, but, with experience, as becoming more differentiated and coordinated into systems of increasing complexity and coherence (Case, 1992). Piaget was of the opinion that, at certain points in the child's development, these systems would stabilize and would gain organizational properties which could be explained through symbolic logic. In other words, Piaget thought that similar understandings tend to be acquired around the same age across a wide variety of domains by suggesting that these understandings all require the application of the same underlying logical structure. He considered these shifts in development to take place at the age of about 2 years, when the development of the child's earliest sensory and motor capabilities is complete, and again at about the age of 7 years, when the appearance and development of a more advanced group of operations that are representational in nature occurs. At the beginning of adolescence the third major shift takes place, with the emergence and development of a set of representations that are more abstract or formal in nature.

These stable systems play a major role in shaping children's perceptions of the world around them. Because of that, Piaget divided children's cognitive development into four general stages, taking into consideration the attainment or non-attainment of the thought that these systems allowed. Piaget called the four stages the sensorimotor stage (0 to 2 years), the pre-operational stage

(2 to 7 years), the concrete operational stage (7 to 10 years) and the formal operational stage (11 to adulthood). Characteristics of the stages include the increasing ability to engage logical thought and to separate internal realities such as wishes, needs, and thoughts from the outside world. At the same time there is an increasing ability to distinguish other people's points of view from the child's own. For example, if we look at the child's understanding of the intent of medical procedures and the role of medical personnel, we notice a change in the pattern of responses of the child at different stages (Brewster, 1982). A five-year-old child is more likely to state that medical procedures are done to punish him/her for being bad, while a ten-year-old can understand the intentions of doctors and nurses and why certain medical procedures have to be done. Piaget explained the transition from one of these stages to the next by suggesting that both children's active thoughts about the outcome of their current mental activity and their attempt to deal with the inherent contradiction that this reflection of thoughts causes, play an important role in the stage-transition process.

Piaget's framework of cognitive development provided a useful theoretical perspective for a number of studies which investigated the child's capacity to view illness in a logical way (Bibace & Walsh, 1980; Brewster, 1982; Brodie, 1974; Campbell, 1978; Cook, 1975; Neuhauser et al., 1978;

Perrin & Gerrity, 1981; Potter & Roberts, 1984; Redpath & Rogers, 1983). Children's conceptions of illness can be seen to follow a developmental progression which parallels shifts in the child's cognitive processes, changing from primitive, egocentric reasoning to more abstract and concretely logical views (Whitt, Dykstra, & Taylor, 1979). Only a concrete operational child can be expected to decenter from isolated perceptual symptoms of illness. Full comprehension of abstract notions of disease is to be expected with the attainment of formal operational thinking (Bibace & Walsh, 1979).

The most comprehensive account of children's beliefs about the cause and implications of illness as a function of cognitive maturity has been proposed by Bibace and Walsh (1981). Bibace and Walsh (1979) mentioned three major types of explanations of illness consonant with Piagetian stages of cognitive development: prelogical, concrete logical, and formal logical. Within each of these major categories they distinguished two subtypes of explanation:

- I. *Prelogical Explanations* (Approx. 2-6/7 Years)
  - Category 1: Phenomenism
  - Category 2: Contagion
- II. *Concrete-Logical Explanations* (Approx. 7-11/12 Years)
  - Category 3: Contamination
  - Category 4: Internalization
- III. *Formal-Logical Explanations* (Approx. 12 Years-Adult)
  - Category 5: Physiological
  - Category 6: Psychophysiological (Bibace & Walsh, 1980, p. 35)

Phenomenism represents the most developmentally immature explanation of illness. The child sees the cause of the illness as an external concrete phenomenon that may come with the illness but that is unrelated spatially and/or temporally to the illness (Bibace & Walsh, 1980). "How do people get colds? 'From the sun.' How does the sun give you a cold? 'It just does, that's all'"(Bibace & Walsh, 1981, p. 36).

Contagion is the most common explanation given by the more mature child in the prelogical stage. Objects or people that are close to, but not in physical contact with, the child are seen as the cause of illness (Bibace & Walsh, 1980).

How do people get colds? "From outside." How do they get them from outside? "They just do, that's all. They come when someone else gets near you." How? "I don't know -by magic I think." How do people get colds? "When someone else gets near them." (Bibace & Walsh, 1981, p. 36)

Contamination characterizes children's explanations in the early concrete-logical stage. The child can now differentiate between the cause of the illness and the effect on his/her body. A person, object, or action that is external to the child and that has an aspect or quality that will have a bad or harmful impact on the body are seen as the cause of illness (Bibace & Walsh, 1980).

What is a cold? "It's like in the wintertime." How do people get them? "You're outside without a hat and you start sneezing. Your head would get cold, the cold would touch it, and then it would go all over your body." (Bibace & Walsh, 1981, p. 36)

Internalization is the most common type of illness explanation given by older children in the concrete-logical stage. The cause of illness is seen now as being located inside the body, but its ultimate cause may be explained as coming from outside the body. The child is capable of relating the internal effect of illness to the external cause, usually a person or object, through a process of internalization (Bibace & Walsh, 1980).

What is a cold? "You sneeze a lot, you talk funny, and your nose is clogged up." How do people get colds? "In winter, they breathe in too much air into their nose, and it blocks up the nose." How does this cause colds? "The bacteria gets in by breathing. Then the lungs get too soft, and it goes to the nose." (Bibace & Walsh, 1981, p. 37)

The younger children in the formal-logical stage are more likely to give physiological explanations. They see the cause of illness as the nonfunctioning or malfunctioning of an internal organ or process. The cause may be induced by external events but the source and nature of the illness lie in specific internal physiological structures and functions (Bibace & Walsh, 1980).

What is a cold? "It's when you get all stuffed up inside, your sinuses get filled up with mucus. Sometimes your lungs do too, and you get a cough." How do people get colds? "They come from viruses, I guess. Other people have the virus, and it gets into your blood stream and it causes a cold." (Bibace & Walsh, 1981, p. 37)

Psychophysiological explanations represent the most mature understanding of illness. The child is not only aware of the physiological aspects of illness but also the

psychological. The child understands now that also a person's thoughts or feelings might have influence on the way the body works (Bibace & Walsh, 1980).

What is a heart attack? "It's when your heart stops working right. Sometimes it's pumping too slow or too fast. "How do people get a heart attack? "It can come from being all nerve-racked. You worry too much. The tension can affect your heart." (Bibace & Walsh, 1981, p.38)

Most studies of the child's conceptual understanding of illness have used the Piagetian approach. Burbach and Peterson (1986) give an overview of the different studies based on the Piagetian orientation. They divide the studies on the basis of health status of samples utilized because the health status of children has been hypothesized to have an important effect on children's concepts of illness (Brewster, 1982; Cook, 1975; Redpath & Rogers, 1984). For example, Brewster's study (1982) showed that there was no relationship between length of hospitalization or type of illness and levels of cognitive understanding of illness. Cook's study (1975), on the other hand, revealed that sick children were less mature than healthy children in their explanations of illness.

The studies based on the Piagetian approach included healthy samples (Bibace & Walsh, 1980; Brodie, 1974; Neuhauser et al., 1978; Perrin & Gerrity, 1981; Potter & Roberts, 1984; Redpath & Rogers, 1983), hospitalized samples (Brewster, 1982; Campbell, 1978) and combined samples of healthy and hospitalized and/or chronically ill children

(Cook, 1975; Perrin, Sayer, & Willett, 1991; Shagena, Sandler, & Perrin, 1988). The hospitalized samples consisted of children with various illnesses (Brewster, 1982; Campbell, 1978).

The few studies that described the development of children with chronic conditions from early childhood to adolescence (Perrin & Gerrity, 1984; Yoos, 1987) suggested, in general, that children's development can best be explained by referring to the common expectations for the cognitive and social-emotional development of all children. However, they also state that the cognitive and social-emotional development of some children with chronic conditions may be delayed at some stages due to the fact that physical illness may have certain implications at each stage of development and can potentially interfere with or increase the difficulty of optimal progression from one stage of development to the next. For example, physical illness may restrict children's ability to achieve certain motor and social skills.

Most of the studies based on the Piagetian approach emphasized conceptual understanding of illness, in particular the child's explanation of the cause of illness (Bibace & Walsh, 1980; Brewster, 1982; Brodie, 1974; Campbell, 1975; Perrin & Gerrity, 1981; Potter & Roberts, 1984). Only a few authors have included the role of nurses and doctors in their studies with children (Brewster, 1982;

Eiser, 1989; Haight et al., 1985; Redpath & Rogers, 1984). Studies that included the role of nurses and doctors will now be examined for their contribution to articulating the nature of the child's understanding of the nurse's role.

Piagetian Studies that Included the Role of Medical Personnel.

Brewster (1982) focused on two areas, namely the child's understanding of the cause of his/her illness and the child's understanding of the reasons for medical treatment and the role that medical personnel play in this treatment. According to Brewster, children's comprehension of illness, hospitalization, and medical personnel develops from finalistic and univariate thinking to more multiple causal reasoning. For example, her data suggested that 5- and 6-year-old children thought that medical procedures were done to punish them. Children aged 7 to 10 years often were aware of the fact that treatment is intended to help them get well, but they were limited in their ability to interpret empathy of doctors and nurses. For example, they thought that nurses could understand their pain only if they were screaming or crying. Children aged 11 years and older considered their doctors and nurses as being empathetic, because of shared human experiences and because they could put themselves in the child's place. Some of the children at this level gave responses that doctors and nurses could never know exactly how they felt because only someone who



had suffered as much as they did could fully understand what they went through. Children at this age were able to give a more sophisticated response of how they viewed medical personnel. Brewster's hypothesis, based on psychoanalytic thought, that a child's understanding of matters in high affect areas (e.g., concerning the child's own illness) might be regressed compared to his/her understanding of low affect areas was rejected. Brewster's study also showed that the level of response of children of higher socioeconomic class was significantly more advanced than that of children of lower socioeconomic class. The degree of advancement in terms of stage was not mentioned in this study.

Redpath and Rogers (1984) compared the cognitive understandings of never-hospitalized children with those who had been hospitalized previously but who were healthy at the time of the study. Their sample consisted only of preschoolers and second graders. The majority of the preschoolers could not say what nurses do, whereas second graders could give more details about roles of doctors and nurses. Both preschoolers and second graders were better able to explain the duties of doctors than of nurses. Both age levels seemed to have a lack of ability to explain why doctors and nurses use certain medical procedures.

Haight et al. (1985) examined 4- and 5-year-old children's understanding of the social roles of doctor and

patient by using a brief clinical interview and puppet play. They suggested that children's social role concepts and explanations for certain medical procedures may be quite different from those thought by the adult health professional and they warn newly trained paediatric health professionals to be aware of possible miscommunication between themselves and the child. For example, a health professional might try to calm a child down by carefully explaining the purpose for use of a certain instrument, such as a tongue depressor. The child, on the other hand, may be impatient with and unable to understand all the difficult concepts such as inflammation or infection and would prefer a concrete demonstration of how to use the instrument by looking into his/her throat.

According to Haight et al. (1985) the health care professional should also realize that children are not totally passive. Children often strive actively to understand many aspects of the medical interview. Health care professionals should try to encourage children's questions, disclosures and inquiries. However, Haight et al.'s study was limited by the small sample ( $n=13$ ), the children's age range (only 4 and 5 year olds were examined) and the middle-class socioeconomic status of the children.

Eiser (1989b) attempted to apply the script theory approach instead of Piaget's theory of cognitive development to an analysis of 4- and 8-year old healthy children's play

using doctor and nurse dolls. Scripted episodes of children's imaginative play can be seen as "a sequence of actions related temporally and causally" (Nelson, 1985, p. 18). Eiser's main objection to the Piagetian stage approach is that it focuses too much on verbal descriptions (see, for example, Bibace and Walsh, 1981), while children's representations of social events can also be examined by analyzing fantasy play within a script framework (Nelson & Seidman, 1984). Children's play can give us a wider perspective of what children really do know about illness and not only what they tell us. For example, Eiser mentioned the discrepancy in data obtained from very young cancer patients on questionnaires about the cause of illness or what happens in hospital, compared with observations of these children at play. These very young cancer patients were better able to express their thoughts about and understanding of their condition through play than through answering questionnaires (Kendrick, Cullin, Oakhill & Mott, 1986, cited in Eiser, 1989b). Eiser's data suggest that Piaget's stage approach is not invalid for examining how children conceptualize illness, but she points out that various methods besides Piagetian tasks have to be used in order to get a total understanding of children's conceptual understanding of illness.

Perrin and Perrin (1983) examined the accuracy of medical personnel in estimating the age at which children

give developmentally characteristic answers to a series of questions about illness. They conclude that medical personnel do not have enough understanding about how children interpret the world around them. For example, Perrin and Perrin's data suggest that medical personnel in general either overestimate the conceptual sophistication with which young children think about illness, or underestimate older children's understanding.

Therefore, a better understanding of children's conception of a hospital nurse's role can be used to facilitate or improve the services currently offered by paediatric health care professionals. To understand a child's conception of the hospital nurse's role better a closer look at this issue is necessary. Nurses interact with children during many hospital activities, such as physical examinations, informal and formal discussions, and activities such as changing dressings, inserting intravenous (IV) needles, and giving medications and injections. Garbarino and Stott (1990) state that the nursing role includes both a technical or clinical component and an affective, nurturing component. Nurses can become effective communication mediators between children and their families and other health care professionals, which makes it important for them to understand the child's understanding of the hospital nurse's role.

None of the studies described looked at the

hospitalized child's conception of the nurse's role in particular and most of the studies examining children's concept development of illness and medical personnel used the Piagetian perspective for their data interpretation. No "neo-structural" analysis has been reported so far in the area of concept development of children with chronic conditions. However, neo-Piagetian theory, specifically Case's (1992) theory, can account for the deficiencies of Piagetian theory and has several advantages.

#### Advantages of Neo-Piagetian Theory Compared to Piagetian Theory

The advantages of a finer grained classification system, as proposed by Case's (1992) neo-Piagetian theory, are discussed in this section. First, Case's theory keeps the four major stages of development from birth to adulthood as proposed by Piaget, but it adds to Piaget's theory by describing three substages within each stage. This gives finer age distinctions and allows for a more detailed analysis of data, because a 6-year-old might reason differently about illness or the role of the hospital nurse than a 10-year-old. Piaget looked at this group as being homogeneous. For example, Piaget's concrete operational stage, ranging from approximately 6-7 to 10 years of age, is subdivided by Case into three substages. The first substage starts at 5 to 7 years, the second substage at 7 to 9 years and the third substage at 9 to 11 years.

Second, another advantage is that Case's theory distinguishes between domains and introduces domain specificity. Each domain has its own "Central Conceptual Structure." To the contrary, Piaget suggested that, regardless of the domain, children acquire a certain general logical structure at different stages in their lives, a "structure of the whole," which drives development across domains. Piaget's structure of the whole has its limitations, because it cannot explain features such as the influence of instruction, the lack of cultural universality in children's experience, low intertask correlations, and decalages. In other words, Piaget's theory can not explain exceptions to the general pattern of development (Case, 1992). For example, how could a cognitive system be open to cultural innovation when it only has a universal and closed set of logico-mathematical operations to rely on? When we want to examine the hospitalized child's understanding of the nurse's role, for example, it may be impossible to count on a universal set of logico-mathematical operations alone for explaining children's conceptions. Hospitalized children find themselves in special situations, which give them different perceptions of the environment and their social worlds. As suggested by Case, it may be more appropriate to use a more specific approach that takes into consideration these experiences and the impact they might have on the child's cognitive development. Case's (1992)

data, for example, show that the content of social structures is quite different from the content of numerical structures that were studied. Social structures appeared to be subject to different sorts of influence.

In the current research, Case's theory (1992) lends a different theoretical background than has been tested on studies done to date. Case (1985, 1992), who considers himself "neo-Piagetian," suggests his own view to explain the weaknesses of Piaget's theory. He acknowledges the impressive strengths in Piaget's theory, but tries to account for more specific factors in development. Specific factors take into consideration the environment the child lives in and the cultural and linguistic background the child grows up in. Case's theory will be described in more detail and the way in which his theory adds to Piagetian theory of cognitive development will be explained further in the next section.

#### Case's Theory: A Neo-Piagetian View.

Over the past few decades, several critiques of classical Piagetian theory have been formulated. The Neo-Piagetian movement (Case, 1978; Fischer, 1980; Pascual-Leone, 1976) addresses the perceived shortcomings in Piaget's theory, namely:

- (a) the absence of a well-defined explanation of how children's cognitive structures change from one stage to the next. Children around the age of six develop more

complex mental structures which enable them to solve problem situations in a more sophisticated fashion. How do 4 year olds come to acquire the increased complexity evident in 6 year olds?

- (b) the absence of an explanation for more specific performance factors. What kind of factors affect children's ability to apply particular structures in particular contexts? For example, what is the influence of instruction on the child's performance?
- (c) the absence of any explanation of individual differences in the cognitive development of children. Why is it that a child's problem-solving abilities can accelerate in one local problem domain under certain circumstances and not in another?

Case (1985, 1992) considers Piaget's account of the "general" factor in development as a major strength that explains the universal way in which children control structures across domains once they are exposed to the appropriate opportunities for learning. On the other hand, Case acknowledges the more domain-specific and contextually sensitive characteristics that subsequent studies have focused on (e.g., Carey, 1985; Chi, 1988; Pascual-Leone, 1976), because these theories try to explain features such as the influence of instruction, the lack of cultural universality in children's experience, low intertask correlations and decalages which the general and monolithic



approach of Piaget could not account for. Carey (1985), for example, is of the opinion that cognitive processes may be analyzed as a set of basic categories or domains of functioning. According to Carey, the origin of these domains lies in the modular structure of the human nervous system, in the evolutionary history of the human organism, and the modular structure of the cortex from which this history has emerged. Consequently, this modular structure makes sure that any stimulus pertinent to each domain is being dealt with by its own distinctive neurological system. Children have their own individual way of responding to stimulation within each domain. Furthermore, the cognitive processes they use for initiating the responses are structured into corresponding and distinctive systems. According to Carey, the conceptual systems or theories that children construct reflect this modular structure. In the course of development, children's conceptual systems are regularly re-worked in either a major or a minor way.

Recently, Case (1992) introduced the term "central conceptual structure" to make a bridge between the more general or "systemic" views that have been proposed by Piagetian and neo-Piagetian theorists and the more domain-specific views (e.g., Carey, 1985; Spelke, 1988). He hypothesizes that children's functioning in the domains of quantitative, social, and spatial functioning may form the basis for different "central conceptual structures." In

order to understand the term "central conceptual structure" better, the term "executive control structure" has to be explained first, because executive control structures form the basic internal program a child uses for solving elementary problems encountered in his/her daily life.

#### Executive Control Structures.

According to Case (1985), one of the most important changes that takes place in a child's development is the ability to put together "executive control structures" for solving different sorts of problems. An executive control structure is defined as a mental scheme or plan for solving a class of problems. These executive control structures have three components, namely:

- (1) a representation of the problem *situation*; that is, the desired state for which the plan is appropriate, and the condition under which it may be put to practical use.
- (2) a representation of the problem *objectives*; that is, the goal toward which the plan is directed, and the conditions that are desired for solution of the problem situation.
- (3) a representation of the problem *strategy*; that is, the mental and/or physical steps a child uses to go from the problem situation to the problem objectives and to come up with a solution to the problem situation.

Case used several tasks to see what kind of executive control structures a child has at different ages. One of

these tasks is the balance beam. Children aged 4, 6, 8, and 10 will solve the problem tasks in different ways (see Table 1). Both Piaget and Case recognize the major transition in intellectual development from 4 to 6 years of age. Piaget called it the time when the first "functional logic" emerges, the logic from which the concrete-operational structure will ultimately be assembled (Piaget, 1970). In Case's theory, this is the time when the transition occurs from a period of "relational" thought to a period of "dimensional" thought (Case, 1985). Further developments take place from ages 6 to 8, and from ages 8 to 10. The changes that take place from ages 6 to 8 and 8 to 10 are not seen as involving major qualitative change, but rather a series of minor quantitative changes (see also Figure 1). These changes constitute a progressive elaboration of the more fundamental change that takes place between the ages of 4 and 6.

At the beginning of each stage, two formerly discrete and qualitatively different control structures are integrated, so that a new unit of thought is created. After the initial transition is made, there is a further progression through a sequence of substages. During these substages the number of such units can be considered as increasing and the overall complexity of the child's mental functioning as increasing with it (Case, 1992).

Table 1

School-aged Children's Control Structures for  
Anticipating Action of Balance Beam

4 years	<p>PROBLEM SITUATION</p> <ul style="list-style-type: none"> <li>. Balance beam with an object on each arm.</li> </ul>	<p>OBJECTIVE</p> <ul style="list-style-type: none"> <li>. Determine which side will go down.</li> </ul>
	<p>STRATEGY</p> <ol style="list-style-type: none"> <li>1. Look at each side. Predict that the one which looks <i>heavy</i> will go down, the <i>light</i> one up.</li> </ol>	
6 years	<p>PROBLEM SITUATION</p> <ul style="list-style-type: none"> <li>. Balance with stack of objects on each arm.</li> <li>. Each stack composed of a number of identical units.</li> </ul>	<p>OBJECTIVES</p> <ul style="list-style-type: none"> <li>. Predict which side will go down.</li> <li>. Determine which side has larger number of units.</li> </ul>
	<p>STRATEGY</p> <ol style="list-style-type: none"> <li>1. Count each set of units; note which side has the bigger number.</li> <li>2. Pick side with bigger number as the one will weigh more (and therefore go down).</li> </ol>	
8 years	<p>PROBLEM SITUATION</p> <ul style="list-style-type: none"> <li>. Balance beam with stack of objects on each side.</li> <li>. Each object stack composed of a number identical units.</li> <li>. Each object at a specifiable distance from fulcrum.</li> </ul>	<p>OBJECTIVES</p> <ul style="list-style-type: none"> <li>. Predict which side will go down.</li> <li>. Determine side with greater number of objects.</li> <li>. Determine side with weight at greater distance.</li> </ul>
	<p>STRATEGY</p> <ol style="list-style-type: none"> <li>1. Count each set of weights; note which side has greater number.</li> <li>2. Repeat 1 for distance pgs.</li> <li>3. If the weights are about equal, predict that the side with the greater distance</li> </ol>	

Table 1 (continued....)

will go down. Otherwise predict that the side with greater weight will go down.

10 years

PROBLEM SITUATION

- . Balance beam with stack of weights at various distances.
- . Action of weight and distance in opposite directions.
- . Each weight stack composed of equal amounts.
- . Each distance composed of number of equal units.

OBJECTIVES

- . Predict which side will go down.
- . Determine whether weight has a greater effect.
- . Determine relative number of weights on each side.
- . Determine relative distance on each side.

STRATEGY

1. Count each distance; note size as well as direction of difference.
2. Repeat step 1 for weight.
3. Compare the magnitude of the results in steps 1 and 2. Notice which is bigger.
4. Focus on dimension of greater difference. Pick side with higher value as one which will go down.

VECTORIAL STAGE\*

Substage 3 (15 1/2-19 yrs.)	$A_1 \overline{X} B_1$ $A_2 \overline{X} B_2$	W.M. 4
Substage 2 (13-15 1/2 yrs.)	$A_1 \overline{B_1}$ $A_2 \overline{B_2}$	3
Substage 1 (11-13 yrs.)	$A - B$	2

4th  
ORDER  
RELATIONS

DIMENSIONAL STAGE

Substage 3 (9-11 yrs.)	$A_1 \overline{X} B_1$ $A_2 \overline{X} B_2$	W.M. 4
Substage 2 (7-9 yrs.)	$A_1 \overline{B_1}$ $A_2 \overline{B_2}$	3
Substage 1 (5-7 yrs.)	$A - B$	2

3rd  
ORDER  
RELATIONS

INTERRELATIONAL STAGE

Substage 3 (3 1/2-5 yrs.)	$A_1 \overline{X} B_1$ $A_2 \overline{X} B_2$	W.M. 4
Substage 2 (2-3 1/2 yrs.)	$A_1 \overline{B_1}$ $A_2 \overline{B_2}$	3
Substage 1 (1 1/2-2 yrs.)	$A - B$	2

2nd  
ORDER  
RELATIONS

SENSORIMOTOR STAGE

Substage 3 (12-18 mos.)	$A_1 \overline{X} B_1$ $A_2 \overline{X} B_2$	W.M. 4
Substage 2 (8-12 mos.)	$A_1 \overline{B_1}$ $A_2 \overline{B_2}$	3
Substage 1 (4-8 mos.)	$A - B$	2
Substage 0 (1-4 mos.)	$A$ or $B$	1

1st  
ORDER  
RELATIONS

\* or ABSTRACT DIMENSIONAL STAGE

Figure 1. Predicted structure of children's knowledge at different stages and substages of development (Case, 1992, p. 346).

Different domains require different executive control structures to solve different sorts of problems. The specific executive control structures for each domain form the basis for a central conceptual structure. The description of a central conceptual structure adds a more semantic account of the conceptual knowledge children possess at any level of development. According to Case (1992), it seems more useful to not only suggest a characterization of development that focuses on procedural complexity, such as is described by executive control structures, but also a characterization that concentrates on the way children represent problems at different ages, such as is proposed by central conceptual structures. Certain representational functions seem to act as a restriction on the acquisition of particular procedures; in other words these functions have to be brought into place somehow before these executive control structures or procedures can be built and applied with effectiveness and flexibility. The notion of "Central Conceptual Structures" will be discussed further in the next section.

#### Central Conceptual Structures

Case (1992) hypothesized that children's functioning in the domains of quantitative, social, and spatial functioning may have different underlying "central conceptual structures." For example, Figure 2 shows the hypothesized underlying central conceptual structure for solving the

4 YRS:

light (up) \_\_\_\_\_ Heavy (down)

6 YRS:

light (up) 

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

 Heavy (down)

8 YRS

Near (up) 

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

 Far (down)

Light (up) 

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

 Heavy (down)

10 YRS

Near (up) 

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

 Far (down)

Light (up) 

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

 Heavy (down)

Figure 2. Central conceptual structure for quantitative reasoning (Case, 1992, p. 95).

Balance Beam Task. This figure explains how children represent a problem, that is, their conceptual understanding of it, and demonstrates that it might be that 4-year-old children are more likely to represent each possible variable in a global or opposite manner. For example, "Big things are worth more; little things are worth less" (Case, 1992, p. 95). Six year olds, on the other hand, are more likely to represent variables in a continuous manner, that is, as having two poles on an actual number line and a number of points in between. Furthermore, at this age children start to understand that these points can also be seen as lying on



a mental number line, so that higher values have a higher number associated with them. For example, the number six has a higher value than the number four. Moreover, 8-year-olds might consider two independent quantitative variables (e.g., days and weeks in a month), but might not be able to make the right comparisons between variations of each of them. For example, a child might understand that thirty minutes is less than forty minutes, but might be unable to comprehend that two hours consist of sixty minutes each. Finally, 10-year-olds might be able to make these successful comparisons by considering the interaction between two quantitative variables (Case, 1992). For example, a 10-year-old child will use a compensation strategy for solving the balance beam task of either adding or subtracting the weights and distance from each side of the fulcrum and base their answer on either the greater number or the greater difference depending on which strategy they use. Both the dimensions of weight and distance are changed at this level (Case, 1985).

Case and Griffin (1990) delineated the following properties of central conceptual structures.

- Central conceptual structures are organized sets of concepts and conceptual relations, not logical relations like those hypothesized by Piaget.
- Central conceptual structures are universal with respect to sequence but likely more specific in their form and

frequency of occurrence. They are universal in the sense that their sequence is dependent on the maturity of the working memory regardless of which domain, but specific in their form and frequency in the sense that their development is related to a specific domain and dependent on the specific experiences of the child within each domain.

- Central conceptual structures can be applied to a wide range of content, but only within a certain domain. For example, the same central conceptual structure can be applied both to children's understanding of empathy and their comprehension of social role which is part of the social cognitive domain, but not to their acquisition of mathematical knowledge. The latter is part of the quantitative domain.
- Central conceptual structures can be instructed in a rather direct manner. Training in understanding of one task will affect the understanding of another task within the same domain because of the same hypothesized underlying central conceptual structure (McKeough, 1992b).
- Central conceptual structures are obtained via socially encouraged processes (i.e., processes which draw the child's attention to specific factors, and stimulate certain kinds of construction rather than others). For example, different cultural experiences (i.e., opportunities presented by the environment to explore

spatial relationships, attendance at Western-type schools, social contact with urbanized people) will have an important impact on the content of children's central conceptual structures and play an increasingly important role with age because the construction of these structures are dependent on knowledge that is unique to the culture in which they were developed (Cole & Scribner, 1974; Vygotsky, 1934/1986).

Case (1992) has different hypotheses about central conceptual structures, which makes it possible to make certain predictions.

- Central conceptual structures permit a parallel set of transformations in the structure of children's knowledge across different domains simultaneously. In other words, each domain has its own underlying set of transformations in children's executive control structures, but these structures show similarities between the different domains. They show similarities because the transformation of these different sets of executive control structures in each domain is dependent on the size of the child's working memory. The nature and degree of her/his experience, on the other hand, will account for individual differences between domains. There is a limit on the efficiency of any operation, no matter in what domain, which is defined by the degree of maturation of the related neurological system and, to make use of

whatever degree of maturation has been obtained, the child should have a certain degree of practice with any operation. Practice will have the effect of automating the particular operation.

- If each domain has a different underlying central conceptual structure then children trained in one task in a domain should show similar improvement on another task within that same domain. McKeough's study (1992b), which used various tasks within the social-cognitive domain, supported this hypothesis. She trained an experimental group to construct stories that were one developmental level higher than those they would tell spontaneously. These children were not only able to construct stories one developmental level higher, but they also transferred their learned knowledge to other intentional tasks, such as the mother's role tasks developed by Goldberg-Reitman (1992) and empathy tasks designed by Bruchkowsky (1992).

Some processes which draw the child's attention to specific factors and which might accelerate the child's development such as shown in McKeough's study, will also involve emotional factors. In order to understand the possible influence of emotions on the development of the child's social-cognitive domain, Case et al.'s (1988) studies, which address the effect of emotional distress on cognitive development, will be described in the next section.

## Neo-Piagetian Interpretation of the Correlation Between Cognition and Emotion

Case et al. (1988) examined the link between cognitive and emotional development. They hypothesized that any change in the emotional system would have a synchronous or subsequent effect on the cognitive system and vice versa. To test this hypothesis, three exploratory studies were done. The first study looked at the emotional responses of children at different cognitive stages to a situation in which the mother of the child neglects him/her for another child, either a younger sibling or a peer. The second study examined infants' emotional responses to a brief separation from their mothers as they approach and then transfer into a new stage of cognitive development. The third study focused on the cognitive development of children who were either emotionally disturbed or normal, and who either had or had not experienced the death of a loved one at an early age.

Results of these studies suggest that children's level of cognitive development can have a strong influence on their emotional experience, but particular emotional experiences that children are confronted with, and the structures they assemble for dealing with them can also exert a strong impact on their cognitive development. The results of the third study are particularly relevant to the current research. Contrary to the psychoanalytic perspective (Deutsch, 1942; Falstein et al. 1957; A. Freud,

1952/1977; Jackson, 1942; Jessner et al., 1952/1977) which proposed a regression in hospitalized children's perceptions and Piagetian studies which supported the notion of a potential delay in development of children with chronic conditions (Perrin & Gerrity, 1981, 1984; Yoos, 1987), Case et al. (1988) hypothesized that chronic internal conflict and anxiety should only lead to a very minimal regression in children's normal rate of cognitive growth if the anxiety is general, since the experience of anxiety decreases the amount of attention that is available for processing and/or short-term storage space by a small but measurable amount. It is further suggested that a child's cognitive development may be accelerated within a specific domain when there is some type of crisis event that occurs within that domain. This is presumed because a child who experiences a traumatic event within that domain will spend more time dealing and coping with this specific situation than a child who is not forced to focus on that specific event. Whether a child accelerates or decelerates depends on the amount of time a child spends concentrating on the problem which he/she faces within that domain. For example, Hurst's (Case et al., 1988) study about children who experienced the loss of a loved one prior to age five showed an acceleration in their understanding of death. Although the magnitude of this acceleration was not large, approximately one-third substage at any age level, it still was statistically significant.

The subjects who showed this acceleration were normal children who had experienced a traumatic loss prior to the dimensional stage. This accelerated understanding was retained up to seven years after the loss. Hurst proposed that a child who loses a family member develops a coping mechanism which will reduce the child's emotional distress. This mechanism does not prevent the child from thinking about the loss but instead enables him/her to direct his/her attention to the topic of death. Consequently, because of the fact that the child's attention is focused on dealing with the loss, this allows the child to overcome his/her grief and prevent him/her from becoming preoccupied with the topic of death (Case et al., 1988).

Hurst's (Case et al., 1988) study is relevant to the current research because if emotions influence the rate of a child's cognitive development in the way suggested, a hospitalized child might also demonstrate an acceleration of understanding of the hospital nurse's role because of the amount of time these children spend in coping with their illness and hospitalization.

Garmezy and Rutter (1983) emphasized two reasons for the different effects that stressful events, such as hospitalization, might have on children. First, most so-called stress situations have a multidimensional nature. For example, acute events may be infinitely more disturbing than are chronic conditions to which one has adapted.

Second, there appears to be individual variation in responsiveness to environmental conditions considered distressing. For example, Appley and Trumbull (1967) have described the relationship between a child and environmental factors that can influence vulnerability in relation to stress as follows:

It is consistently found that these reactions vary in intensity from person to person under exposure to the same environmental event.... It has also been noted that, with few exceptions, the kind of situation which arouses a stress response in a particular individual must be related to significant events in that person's life. Many people have used the terms "ego-strength," "stress-tolerance," and "frustration-tolerance." It is perhaps doubtful that there is such a thing as a general stress-tolerance in people. There is more likely to be a greater or lesser insulation from the effects of certain kinds of stress-producers rather than others.... It seems more likely that there are differing thresholds, depending upon the kinds of threats that are encountered and that individuals must be differently vulnerable to different kinds of stressors.... To know what conditions of the environment are likely to be effective for the particular person, the motivational structure and prior history of the individual would have to be taken into account. Where the particular motives are known - where it is known what a person holds important and not important, what kinds of goals have for him been likely to increase anxiety or lead to aversive or defensive behaviour- a reasonable prediction of stress proneness might be made. (pp. 10-11)

Mabe, Treiber, and Riley (1991) examined school-aged children's emotional distress, such as anxiety and depression, during hospitalization. Their data suggest that hospitalized children experience no greater distress than non-hospitalized children. The number of medical procedures seems to have little effect on the child's emotional state. Furthermore, their findings indicate that previous



hospitalization experiences have little relationship to the child's level of emotional distress. Many children in Mabe et al.'s (1991) study had experienced multiple painful medical procedures and frequent previous hospitalizations. Mabe et al. conclude that children who experience multiple hospitalizations might habituate and adjust successfully to many hospitalization experiences.

Consequently, it can be assumed that hospitalized children with chronic conditions will cope with their illness and hospitalization in a less anxious fashion than children who have never been hospitalized before, because they have habituated to their chronic conditions and dealt with their fears. A child with a long-term health condition will spend more time thinking about his/her hospitalization which might contribute to a reduction of his/her negative feelings (Case et al., 1988).

In this study, the focus will be on the social-cognitive domain and the influence emotions may have on the development within it. This domain will provide a structure for examining the understanding of the nurse's role by hospitalized children with chronic conditions. The child's understanding of the nurse's role is believed to be part of the social-cognitive domain, because the child interacts with the nurse in a social manner and refers to this interaction with his/her perception of the role each of them is playing. Since Case's theory of cognitive development

will be used for this study, a brief description of a study of young girls' conceptions of their mothers' role that used his theory and was done in the social-cognitive domain will be given. Goldberg-Reitman's (1992) study provides the basis for the tasks and analysis in this research. Her study is relevant to the child's understanding of the hospital nurse's role, because it gives an outline of a young girl's social role perception at different age-levels. Children's understanding of their mothers and the many roles their mothers play in their lives is different from their understanding of the hospital nurse's role in certain ways. For example, the closeness and bonding between mother and child develop over a lifetime, while the bonding between a child and a nurse will be only temporary. On the other hand, these two roles show some similarities, both have a caring, protecting, nurturing, and educative character (Brown & Ritchie, 1990).

#### Neo-Piagetian Explanations of Social Role Perception

Goldberg-Reitman (1992) looked at the different aspects of young girls' perception of the mother's role by using Case's theory. She distinguished four particular roles for this purpose, namely those that involved protection, physical care, nurturance, and teaching. The categories were taken from the literature in sociology, social psychology, and family theory (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1982; Lewis & Starr, 1979; Wilson,

1975).

Goldberg-Reitman defines the categories behaviorally as follows:

- *Protection* is any active attempt to guard a child from any kind of potential life threat or dangerous situation.
- *Physical care* is any act that carries out the child's daily physical needs (such as clothing and eating), or that takes away potential physical discomfort (i.e., cold and hunger).
- *Nurturance* is any attempt to give a child the emotional support he/she needs when he or she is feeling upset or confused.
- *Teaching* is any active attempt to pass on knowledge, set boundaries for the child's behaviour and actions, or give the child some moral values of what is right or wrong.

Goldberg-Reitman's categories can be used to look at the nurse's role perception of hospitalized children with chronic conditions because the nurse's role shows a remarkable parallel to the mother's role. In a hospital situation the nurse may temporarily take over the mother's role with the child and take the responsibility for his/her own actions (see Appendixes A and B). The nurse is the person who has to comfort the child when he/she does not feel well and/or has to explain to the child the purpose of different medical procedures. The nurse is the one who helps families to achieve and maintain a balance between the

personal growth needs of the child and the optimum functioning of the family (Whaley & Wong, 1991; see Appendix A). Brown and Ritchie (1990) also did a study that supports the idea that the mother's role functions parallel nurses' functions.

Brown and Ritchie (1990) looked at how nurses perceive roles of parents and nurses in caring for hospitalized children. They stated that nurses see their role as overlapping the parents' role in such a way that both provide psychosocial care, nonmedical, medical, and general care for children, and guide children's activities of daily living. Psychosocial care involves providing emotional support, giving information, hugging, and building a relationship with the child. Nonmedical care involves attending to activities of daily living, such as feeding and dressing and encouraging development. Medical care includes giving medication or treatments, evaluating the child's physical state, and taking care of the changed activities of daily life (e.g., changing the child's position by turning the child in his/her bed). General care involves general care or activities related to either a child's care or to being in the hospital, for example, taking part in care, or organizing care or information. The role of being a gatekeeper is only fulfilled by the nurse. This role includes supervising parents and children and being an advocate by making sure a child receives an ideal level of

care.

The roles described by nurses (Brown & Ritchie, 1990) show similarities with the four functions of the mother's role as delineated by Goldberg-Reitman (1992) in that both nurses and mothers provide care, nurturance, teaching, and protection. Psychosocial care parallels Goldberg-Reitman's nurturance function. The role of nonmedical and medical care shows similarities with the care function. The role of gatekeeper and advocate corresponds to the protection function.

Several studies (Brown & Ritchie 1990; Knox & Hayes, 1983) conclude that nurses and parents should cooperate as much as possible in caring for the hospitalized child. Although these studies state that nurses feel responsible for the care of the hospitalized child, they recommend involvement of the parents to prevent them from feeling left out of their child's care. Furthermore, they consider it advisable for the nurse not to take over the parents' role completely while the child is hospitalized but to involve them in many daily activities and to share responsibility with the parents for their child's care. Algren (1985) supports the mother's involvement in care for her hospitalized child and encourages communication between the nursing staff and the mother. The role in the plan of care of both nurse and mother should be discussed by the nursing staff and the mother to avoid frustration on both sides

according to Algren.

In Goldberg-Reitman's (1992) study, children went from an initial focus on events at 4 years, to a focus at 6 years that included some notice of the main character's internal state (e.g., a desire or goal), to a focus at the age of 10 on two or more such internal states in a more integrated manner. Though Goldberg-Reitman did not include 8-year-olds in her study, she made an assumption by following Case's theory that children this age should be able to consider two rather than one unit of those given by the six-year-olds. McKeough (1992a) refers to this integration as tying together the "landscape of action" with the "landscape of consciousness." Bruner (1986) introduced these two terms to explain the causal relation between the external world of physical states or actions on one hand, and the internal world of feelings and mental states on the other.

Other studies that have been done within the social-cognitive domain are those of McKeough (1992a), Bruchkowsky (1992), and Griffin (1992). McKeough looked in her two studies at the development of children's narratives. In her first study she examined children's narratives from ages four to ten to see if she could support the underlying structural progression hypothesized by Case. In her second study she went further by testing three implications of the neo-Piagetian model of narrative, namely the effect of explicit cuing, manipulation of structural complexity and

effects of instruction, described in her first study. Bruchkowsky (1992) examined children's development of empathic cognition by presenting children with three videotaped vignettes, one each depicting happy, sad, and angry situations. Griffin (1992) did research on young children's awareness of their inner world, in other words, children's intrapersonal intelligence. She was especially interested in the growth of children's understanding of intentionality.

McKeough (1992a), Griffin (1992), and Bruchkowsky (1992) report an underlying structural progression that fits the general characterization suggested by Case's theory, and that particularly appeared very similar to the structures Goldberg-Reitman (1992) found in her study. For example, the particular narrative structures that McKeough found in the children's stories showed a substantial resemblance to those that were described in the study of Goldberg-Reitman. At the age of 4, children tell stories that are still very uncomplicated, involve a sequence of temporally and causally related events, and are close to their everyday life experience. At six, their stories start to evolve around a problem. At the age of eight, they not only tell stories that center around a problem but they also include a series of further complications, often ones that make solution of the problem more complicated. Finally at the age of ten, children tell stories in which they integrate major and

minor problems to come up with a solution.

Although the surface features of the tasks of Goldberg-Reitman, Griffin, Bruchkowsky, and McKeough's studies seem quite different, all these studies have suggested the same underlying structure for solution of the tasks. This central social structure is one that determines a sequence of social events (i.e., Bruner's [1986] landscape of action), on the one hand, and the psychological intentions that motivate these events (i.e., Bruner's landscape of consciousness), on the other (i.e. feelings, desires, opinions etc.), integrated into a single coherent entity.

Another study in the neo-Piagetian tradition that focused on social role acquisition was done by Fischer and Pipp (1984). Their study gives support to the developmental argument that changes in children's role acquisition are related to age. They tested the nature of children's social role acquisition at different ages by using doctor and nurse dolls. According to Fischer and Pipp's approach, called "skill theory," two types of processes take place to explain development and learning, namely optimal level and skill acquisition. Optimal level determines the upper limit on the complexity of skill that an individual can control. For a child to function at that upper limit, the child's performance must be supported by environmental factors, such as practice and instruction. Skill-acquisition processes determine how the skills are actually put together, in other



words, how a child moves from a simple skill in a given context to a more complex or general skill in that same context.

Fischer and Pipp (1984) divide the acquisition of skill structures into three major cycles subdivided into ten levels. The levels are explained structurally, in terms of three behavioral sets or categories, namely sensorimotor actions (from approximately 3-4 months to 4 years), representations (from approximately 4 to 10 years), and abstractions (from approximately 10 to 26 years) and types of relations between those sets.

According to Fischer and Pipp, a social role involves a relation between a primary role, such as a doctor, and a complementary role, such as patient. They divided, for example, the acquisition of the social role within the representational stage (from approximately 4- to 10-years old) into five steps. Initially at step 1, a child is able to pretend that a doctor or nurse doll examines a patient doll, who responds appropriately. They call this level representational mappings. At step 2, a child is capable of transferring a skill mastered in one task to another, similar task. This is only possible when all except one of the components in the second skill structure are similar to the first structure and when the single different one can be transferred to the other task (i.e., a child pretends that a doctor doll examines a mother doll instead of a patient

doll, who then responds appropriately). This is called substitution. At step 3, a child is capable of changing from one skill to the other within a single task or situation by focusing on either one of them (i.e., a child pretends that a doctor doll examines a patient doll, who interacts correctly; and then changes to a nurse doll instead of a doctor doll who examines the patient doll, who also interacts the right way). This is called focusing. At step 4, called compounding, two skills at a given level are joined together to develop a more complicated skill that unites the components into one (i.e., a child may combine two role skills, doctor/patient and nurse/patient, to develop a new more complex structure, doctor/nurse/patient). At the last step, called intercoordination, a child can combine skills to transfer behaviour to a higher level. For example, a child assumes that a doctor doll examines a patient doll and concurrently acts as a father to the patient, who is his son or daughter. The patient doll acts correctly as both patient and father's child.

Fischer and Pipp (1984) looked at the doctor's and nurse's actions in general without creating certain problem situations a child might face when hospitalized. This is a reason for using Goldberg-Reitman's (1992) four levels (nurturance, teaching, care and protection) to give a better understanding of the child's perception of the nurse in different situations and circumstances. Goldberg-Reitman's

four categories of roles laid the groundwork for an analysis of children's social representations of the hospital nurse's role.

### Summary and Conclusions

There is little research on the child's perception of the hospital nurse's role. Garbarino and Stott (1990) emphasized the important role the nurse plays for the hospitalized child. The nurse interacts with the child in a caring, nurturing, protecting, and teaching manner and her/his role shows many parallels with the mother's role (Brown & Ritchie, 1990). Perrin and Perrin (1983) emphasized that a better understanding of the child's development by medical personnel will improve the medical treatment of the child. A better understanding of the perception of the nurse by a child with a chronic condition will contribute to improvement of the nurse's role.

Therefore, the purpose of this study was to obtain a better understanding of hospitalized children's perception of the nurse's role. According to Case et al. (1988), a child with intensive experience in a domain will show a slight acceleration in development in that domain. Since the child's understanding of the nurse's role is part of the social-cognitive domain, a comparison with another domain is necessary in order to demonstrate a potential difference in the child's level of understanding across domains. Consequently, the balance beam task which examines the

child's level of causal reasoning and is part of the quantitative domain (Case, 1992) was used to make such a comparison. Furthermore, McKeough (1992b) stated that if a child shows advancement in one task within a domain (e.g., a hospitalized child's understanding of the nurse's role), he/she should also demonstrate advancement in understanding in another task within that same domain. Therefore, Griffin's (1992) measure of intrapersonal understanding was used to compare hospitalized children's understanding of the nurse's role with their intentional state understanding. Thus, the following research questions directed the research.

#### Research questions

Five research questions form the basis for the study.

- A. Do the mean level scores of Case's stages of cognitive development coincide with the mean scores of children with chronic conditions on their perception of the hospital nurse's roles (i.e., care, protection, nurturance, and teaching)?
- B. Do the mean level scores of Case's stages of cognitive development correspond with the mean scores of children with chronic conditions on a causal reasoning task?
- C. Are the mean scores of children with chronic conditions on their perception of the hospital nurse's roles advanced as compared to their mean scores on causal reasoning?

- D. Do the mean level scores of Case's stages of cognitive development coincide with the mean scores of children with chronic conditions on their intrapersonal understanding (i.e., happy, sad, good, and bad)?
- E. Does advanced understanding of the hospital nurse's role correspond to an advanced understanding on another task which is social in nature? In other words, do the mean scores of children with chronic conditions on their perception of the hospital nurse's roles coincide with the mean scores of their intrapersonal understanding?

## CHAPTER III

### METHOD

#### Introduction and Design

A descriptive (exploratory), theory testing design was used. To test Case's (1992) theory, descriptive data were collected by assessing children using three developmental tasks. These data were supplemented with narrative data collected through audio-taped recordings of interactions with the children and type-written field notes. A convenience sample was selected of children aged 4 to 10, who were hospitalized at the time. Data were transcribed and coded according to specified criteria. From these, a subsample of children was selected to provide contextual description of the data.

Analyses of variance and t-tests were performed to test the following hypotheses.

#### Hypotheses

- A. The mean level scores on the Nurse's Role Task obtained by children with chronic conditions will coincide with those predicted by Case (1992) such that the means of 4-, 6-, 8-, and 10-year-olds will be significantly different from each other.
- B. The mean level scores on the Balance Beam Task obtained by children with chronic conditions will coincide with

those predicted by Case (1992) such that the means of 4-, 6-, 8-, and 10-year-olds will be significantly different from each other.

- C. There will be a significant difference between the understanding of the hospital nurse's role of a child with a chronic condition and his/her causal reasoning as measured by the Nurse's Role Task and the Balance Beam Task, respectively, such that the understanding of the nurse's role of a child with a chronic condition will be advanced compared to his/her level of causal reasoning.
- D. The mean level scores on the Task of Intrapersonal Understanding obtained by children with chronic conditions will coincide with those predicted by Case (1992) such that the means of 4-, 6-, 8-, and 10-year-olds will be significantly different from each other.
- E. There will be no significant difference between the intrapersonal understanding of a child with a chronic condition and his/her understanding of the hospital nurse's role.

### Subjects

Thirty-five children with chronic conditions were selected from several units of British Columbia's Children's Hospital (see Table 2). A non-categorical approach to subject selection was used (Stein & Jessop, 1989). Stein and Jessop's (1989) data suggest that diagnostic labels do

Table 2  
Distribution of Chronic Conditions  
in Each Age Group

Disease or Condition	Age group			
	4 yrs.	6 yrs.	8 yrs.	10 yrs.
Cystic Fibrosis	1	3	2	3
Asthma	...	1	2	...
Congenital Heart Defect	...	1	...	1
Pancreatitis	...	...	1	...
Prune Belly Syndrome	...	...	1	...
Spina Bifida	...	1	1	...
Guillain-Barre Syndrome	...	...	...	1
Tumour (benign)	...	...	...	1
Hypospadias	...	...	...	1
Orthopaedic Conditions	1	...	1	1
Chronic Pyelonephritis	...	...	1	...
Crohn's Disease	...	1	...	...
Liver Transplant (biliary atresia)	1	...	...	1
Nephrotic Syndrome	1	...	...	...
Seizures	...	1	...	...
Ectodermal Dysplasia With Steatorrhoea	...	1	...	...
Other (multiple chronic conditions)	1	1	1	1
Total	5	10	10	10

not tell very much about many areas of concern in the lives of children with chronic conditions and their families. On the one hand, the diagnosis is a fundamental and important factor in treating the physical and bio-medical aspects of a child's condition, but on the other hand, the medical



diagnosis should not be seen as fundamentally important to research on social domains, because it does not provide much information about the status and situation of the child and family, information which is particularly important in the context of the care of children with chronic conditions (Stein & Jessop, 1989). This means that the diagnostic label was not the key variable in choosing the subjects for the proposed study.

Direct advantages in research on chronic illness that can be expected from a noncategorical approach, according to Stein and Jessop (1989), are:

- Local communities are more likely to have children with a wide range of conditions, but only a small number of children that will have the same type of illness. By using a noncategorical approach to study children with chronic conditions the development and evaluation of service programs designed to meet the needs of these children with a spectrum of conditions may be enhanced.
- By focusing on the differences between children unrelated to their chronic illness rather than disease-specific differences between them, the implementation of health care services would be more beneficial.
- Exclusive concentration on disease-specific issues, and neglect of the traits common in these children, makes generalization based on past experience to children with different kinds of chronic conditions impossible.

- The ability to look collectively at many small groups of children significantly increases the possibilities of doing health care delivery research and research on psychological and social issues with population-based samples.

Randomization was not used because of feasibility; it would have been difficult to get enough subjects who fitted the qualifying criteria from the numbers available in the targeted age group and geographic locations.

Criteria for qualifying children for the study were as follows: The children had chronic conditions, had parents consented to their participation, and had to stay in the hospital for a minimum of 3 days. The children had to be beyond their diagnostic phase, which is the phase in which children enter the hospital, have many tests and health history interviews, receive medical diagnosis and commence medical treatments (e.g., medication, operation, and/or tests).

There were ten subjects at each of three age levels: 6, 8, and 10 years old and five subjects at the 4-year-old level. The male/female ratios for the 4-, 6-, 8-, and 10-year-olds was 2:3, 4:1, 7:3, and 1:1, respectively. The cut-off age for the 4-year-olds was 3 years, 11 months and 3 weeks to 4 years, 11 months and 3 weeks. The cut-off age for the 6-year-olds was 5 years, 11 months and 3 weeks to 6 years, 11 months and 3 weeks; for the 8-year-olds, 7 years,

11 months and 3 weeks to 8 years, 11 months and 3 weeks; and for the 10-year-olds, 9 years, 11 months and 3 weeks to 10 years, 11 months and 3 weeks. Mean ages and standard deviations for each age group sampled, in order from youngest to oldest age group, were respectively: 4 years and 5 months (SD = 3.27 mos.), 6 years and 4 months (SD = 3.68 mos.), 8 years and 5 months (SD = 3.63 mos.), and 10 years and 4 months (SD = 4.93 mos.) These ages represent the beginning and end of the interrelational and dimensional stages, as defined in Case's (1985) neo-Piagetian theory. The focus in this research was on the three substages of the dimensional stage and the progressive elaboration that takes place within this stage from ages 6 to 8, and 8 to 10. Children were excluded from participation in the study if their life was threatened, if it was their first in-patient admission, if they were emotionally disturbed as determined by the nursing kardex or nurse or parent report and/or if they had a neurological deficit.

For the contextual description of the data, a subsample of participating children was selected. Children (one from each age level, i.e., one 4-year-old, one 6-year-old, one 8-year-old and one 10-year-old) were chosen if it appeared that they were well qualified to explain their views of the nurse's role and if they showed a moderate advancement in their understanding of that role.

## Setting

British Columbia's Children's Hospital is a modern tertiary paediatric facility in Western Canada. The hospital consists of four-bed, two-bed, and private rooms arranged in 18-21 bed units around a nurses' station. Each ward has a daily schedule which includes activities such as breakfast, schoolwork (i.e., either in the hospital's schoolroom or at the child's bedside), lunch, medical check-ups, quiet resting time, play time organized by Child Life Workers, and dinner. Hospital policies allow 24-hour visiting for parents and provide rooming-in facilities and guidelines. Several Parents' Lounges are available where parents can go to be quiet or to smoke.

The research was done at the child's bedside during either lunch or rest time. Parents were allowed to be present during the research if it made the child feel more comfortable. They were asked to observe during task administration and to wait with possible comments or questions until after the tasks were done.

## Tasks

### Understanding of the Hospital Nurse's Role.

In order to examine children's understanding of Goldberg-Reitman's (1992) four categories, a set of pictures and stories were developed that deal with the real-life social interactions a child experiences in hospital (see Appendix C). Two series of pictures and stories represented

each category. Each story involved a mini-episode in which a nurse could interact with the child in one of four ways. Similar methods have been utilized by Goldberg-Reitman (1984, 1992), Selman and Byrne (1974), and Turiel (1983).

Story structure was held constant with respect to form by using the story grammar principles delineated by Schank and Abelson (1977). Similar to their story grammar format, the scripts in the present study were created so as to contain the following elements:

1. Setting (context)



2. Initiating Event



3. Reaction of Main Character

In the present context, these elements were specified by stories such as the following:

1. Setting: A little girl/boy is in the bathroom.
2. Initiating Event: All of a sudden she/he doesn't feel so well and wants to go to her/his bed soon.
3. Reaction of Main Character: The little girl/boy presses the button and cries for help.

Each story component was illustrated with one picture frame (see Appendix C). Each picture series contained a short hospital scenario and was explained verbally to the child as it was presented (see Table 3). A boy's version and a girl's version were designed.

Table 3

Verbal Descriptions of the Stories,

Two for Each of the Four Functions of the Nurse's Role

<u>Protection</u>	<u>Care</u>
<ol style="list-style-type: none"> <li>1. A little girl/boy is in the bathroom.</li> <li>2. All of a sudden she/he doesn't feel so well and wants to go to her/his bed soon.</li> <li>3. The little boy/girl presses the button and cries for help.</li> </ol>	<ol style="list-style-type: none"> <li>1. The little girl/boy sits on her/his bed and eats her/his dinner.</li> <li>2. She/he turns around and her/his food falls off her/his plate onto her/his bed.</li> <li>3. The little girl/boy says, "I feel yucky and gucky."</li> </ol>
<ol style="list-style-type: none"> <li>1. The little girl/boy's Intravenous or I.V. bottles are getting empty.</li> <li>2. Her/his machine starts to beep.</li> <li>3. The little boy/girl starts to panic and calls for help.</li> </ol>	<ol style="list-style-type: none"> <li>1. A little girl/boy lies in bed and wants to sleep.</li> <li>2. She/he feels cold and starts to shiver.</li> <li>3. The little girl/boy would like an extra blanket and cries out for help.</li> </ol>
<u>Nurturance</u>	<u>Teaching</u>
<ol style="list-style-type: none"> <li>1. The little girl/boy's mum is at the cafeteria.</li> <li>2. She/he discovers that she/he lost her/his favourite teddy bear.</li> <li>3. The little girl/boy feels sad and starts to cry.</li> </ol>	<ol style="list-style-type: none"> <li>1. The little girl/boy will have a special test today and is not allowed to drink or eat anything.</li> <li>2. She/he feels hungry and thirsty.</li> <li>3. The little girl/boy says, "I would like to drink something."</li> </ol>
<ol style="list-style-type: none"> <li>1. The little girl/boy wants to go to sleep. Mummy is not here tonight.</li> <li>2. She/he would like to have a hug.</li> <li>3. The little girl/boy cries and doesn't know what to do.</li> </ol>	<ol style="list-style-type: none"> <li>1. The little boy/girl has a small operation today and has to wear a hospital gown.</li> <li>2. The little boy/girl refuses, because he/she wants to wear his/her own pyjamas.</li> <li>3. He/she is angry and starts to cry.</li> </ol>

Subsequently, the children were asked how they thought the little boy/girl in the story would feel, how they thought the nurse of the little girl/boy would respond, why

they thought the nurse would respond that way and what they thought the nurse was thinking and feeling.

The different story formats were kept similar to those developed by Goldberg-Reitman (1984, 1992). Furthermore, a group of people knowledgeable in both the neo-Piagetian and nursing field examined the story formats together with the pictures and agreed that each of them appeared to measure the functions of the nurse's role, as were discussed in the previous chapter, in an adequate fashion.

Bruchkowsky (1992) criticized the use of cartoon pictures for eliciting children's cognitive and affective capacities on the grounds that they do not give children enough realistic or comprehensive cues on which to base their analysis and that the paradigm of cartoon pictures relies too much on how children express their thoughts and feelings verbally. In an effort to mitigate these problems, the pictures that were designed for this research represented certain hospital situations which provided more realistic and comprehensive cues. The images portrayed were closer to reality than the cartoons used for Goldberg-Reitman's (1992) study.

The child was given several prompts in order to achieve an optimal level of response and to prevent putting him/her at a disadvantage because of insufficient language skills. For example, "What do you mean by ....(idea mentioned by the child)? Tell me more about.... (idea mentioned by the

child)?" To further address the issue of language skills, a "bare-bones" response was scored as evidence of achieving the structure of the appropriate stage to allow the child to obtain a score at his/her optimal level (Griffin, 1992). For example, if the child gave a response that met the criterion for a certain structure but was minimally articulated, the score of that structure level was given.

Once the child had been selected for the study and rapport with the researcher had been established, he/she was given the following introduction:

I'm very interested in how 4 (6-, 8-, 10-) year-olds think about nurses and what they think nurses will do when children have a problem. So I'm going to show you some pictures and then ask you some questions about them. I would like you to tell me as much as you can about the story in the pictures.

After the child had been told the story by showing the pictures (see Appendix C), the following standard questions, adapted from Goldberg-Reitman's (1992) questionnaire, were asked in the order indicated:

- \* How do you think the little girl/boy feels?
- \* What does the nurse do? Why?
- \* What is the nurse thinking? Why?
- \* How does the nurse feel? Why?
- \* What does the little girl/boy do then? Why?
- \* What is the girl/boy thinking then? Why?
- \* How does the little girl/boy feel then? Why?

Each story had the same structure and was followed by the same set of questions. The syntactic and semantic



complexity of the stories did not vary across the various stories. Each interview was audiotape-recorded and transcribed for analysis. Scoring criteria are described in detail in the next chapter.

#### Balance Beam

In order to compare the cognitive level of the child across different domains, a second task was given. The Balance Beam Task was developed by Siegler (1976) and was used by many researchers (Case, 1985; Furman, 1981, cited in Case, 1985; Marini, 1984, 1992) to measure the level of development within the quantitative domain (see Table 1, p. 39). The test instrument consists of a wooden balance scale and 10 metal washers. The arm of the balance beam is 32 in. long, with four pins on each side of the fulcrum. The first pin on each side is 3 in. from the fulcrum, with each next pin 3 in. from the pin before it. Two wooden blocks were placed under the balance beam arms during presentation of test items to prevent the arm from going up and down.

The Balance Beam Tasks were designed to elicit the strategies used in the interrelational and dimensional substages. The tasks that focus on the thinking strategy of the first vectorial substage were also included to give the child the opportunity to achieve as high a score as possible and to prevent the occurrence of a ceiling effect with 10-year-olds. The balance beam task was given in a basal-ceiling fashion. The examiner stopped the task when a child

missed both trials at a level.

To start with, the child was shown the up and down movement of the balance beam when there were no supports present. Then the child was shown how a washer placed on either side of the beam would make it to go down. Subsequently, the child was asked to try out the procedure him/herself. The child was assured that all the washers had the same weight, and were made out of the same material. Furthermore, the child was told that the pegs had equal distances between them.

The following instructions were given:

Let's see what you know about the balance beam. I'll put the weights on the pegs in different ways and you tell me whether this side would go down or this side would go down or whether they would stay like they are now if I took the wood blocks away. The balance beam won't actually move, but you tell me how the beam would go if the pieces of wood were not there. (Siegler, 1976, pp. 491-492).

Test items were given by changing weights and distances on the balance beam (see Appendixes D and E). Two trials were presented at each level. Subjects started at Substage 0 and went on until they failed both trials of a level. Each prediction and justification was written down and audiotaped by the researcher. Then the wooden support was taken away so that the child could see the result.

Scoring criteria are discussed in detail in the next chapter. A random sample of responses (five protocols of each age group) were scored by an independent rater who did not know the ages of the children in order to obtain

interrater agreement (i.e., an indicator of reliability).

### Intrapersonal Understanding

In order to demonstrate advancement in understanding in tasks within the same domain, hospitalized children's understanding of the nurse's role was compared with their intentional state understanding, both are considered to be part of the social domain (Case, 1992). Griffin's (1992) measure of intrapersonal understanding was used. This instrument was utilized by several researchers that examined children's intrapersonal intelligence (Griffin, 1992; McKeough, 1992b; Porath, 1995). The measure examines children's explanations for four internal states (i.e., happy, sad, good, and bad) by asking the child a set of four questions regarding each internal state. For example, the set of four questions for the internal state "happy" are as follows: "What does it mean to be happy? What else can it mean? What is happening when you are happy? When you are happy doing -----(child's example), where does the happiness come from?" (see Appendix F). The 4-year-olds were also given some facilitating props (e.g., a stuffed animal, named Mimi, that helped the child to feel at ease).

The following instructions were given to 4-year-olds:

#### I. Happy

"Mimi the dog doesn't know very many words. You know lots of words and you can help Mimi. Mimi needs to know what 'happy' means. Can you tell Mimi what it means to be happy?.... Can it mean anything else?.... What is happening when you are happy?.... When you are happy doing------(child's example), where does the

happiness come from?  
You taught Mimi a lot about the word 'happy'. Mimi says, 'Thank you.'

## II. Sad

"Now Mimi has another word she wants to know about. The word is 'sad.' Can you tell Mimi what it means to be sad?.... Can it mean anything else?.... What is happening when you are sad?.... When you are sad doing----- (child's example), where does the sadness come from?  
You taught Mimi a lot about the word 'sad.' Mimi says, 'Thank you.'"

The same procedures were used for "good" and "bad."  
Older children (6-, 8-, and 10-year-olds) were given the following introduction to the task:

I am interested in how kids think and how kids feel when they are 6 (8, 10) years old. You know, when you get to be grown-up, you think differently than you did when you were 6 (8, 10) years old. You are 6 (8, 10) and you can really help me by telling me exactly how you think and feel when I ask you some questions. There are no right or wrong answers to these questions. The best answer is for you to tell me just what you think and just what you feel.

The answers to the questions were tape-recorded and transcribed word for word. Responses to the first three questions were pooled for scoring. These questions are referred to as the "Meaning" Tasks (Griffin, 1992) because they ask for a meaning for being happy, sad, good, and bad.

Scoring criteria are discussed in detail in the next chapter. A random sample of responses (five protocols of each age group) were scored by an independent rater who did not know the ages of the children in order to obtain interrater agreement.

## Procedures

The hospital setting was used as the place for the research. Before the research began, the experimental procedures were found to be acceptable on ethical grounds by both the Behavioural Sciences Screening Committee for Research Involving Human Subjects of the University of British Columbia and the In-Hospital Research Review Committee of British Columbia's Children's Hospital. Furthermore, all physicians whose patients might be involved in the research were informed of the study, with an invitation to request more information or to raise concerns prior to commencement of all data collection (see Appendix G). Head/charge nurses' cooperation and assistance both to orient staff and help identify participants were obtained, before the rest of the nurses were informed both verbally and in writing (see Appendix H). No concerns were raised by physicians or nurses and the examiner started the research.

Designated units were visited by the researcher on a regular basis. Children who were qualified to participate in the study were identified by using the nursing kardex or nurse and/or parent report and appropriate consultation of nursing staff. Parents of qualified children were then given a letter by the nurse in which the purpose of the study was discussed and in which they were asked whether they wished to be contacted by the researcher or not (see Appendix I). If they agreed to be contacted, and contact

was made, a short introduction of the purpose of the study was given to them verbally (see Appendix J). Consequently, the parents were asked if they were willing to participate and possible questions were discussed. Children were asked in person if they were willing to cooperate with the study (see Appendix K). After written parental or guardian consent (see Appendix L) had been given, an individual note was sent to each affected admitting physician to inform him/her of the participation of his/her patient (see Appendix M). This procedure was continued until thirty-five participants had been recruited.

Confidentiality of the data was guaranteed. No names of children were recorded on data forms; only code numbers were used. Protocols were maintained in a location which ensured strict confidentiality and to which only the researcher had access. A master list was set up which included the name, gender, age, address, and birthdate of the child. The data forms with the codes on them referred to the codes on the masterlist. Individuals will not be identified in publications.

All tasks were completed by the children in their hospital bed unit. Three sessions, approximately 30 minutes each in duration, were arranged with not more than two days between them. Before undertaking the research tasks, the child was introduced to the tape-recorder by letting him/her record him/herself on the tape. Then the tape was rewound

in order for the child to listen to his/her own voice. After the child had understood the process of tape-recording, the machine was placed in front of him/her and the administering of the tasks was started. In the first session the task of intrapersonal understanding was given (see Appendix F). A stuffed animal, named Mimi, was used for the younger children to make them feel more at ease. In the first or second session, depending on the child's age, the balance beam task was given. A demonstration of the balance beam was given before administering the test items. A bed table was placed in front of the child and the balance beam placed on it. The experimenter sat at the child's bedside. The procedures for administering the balance beam task are described in Appendix E.

The Nurse's Role Task was administered at the second and third session, and if necessary, the fourth session. The eight picture series were given to the child in one, two or three sessions, depending on the child's age. Goldberg-Reitman's (1992) study showed that the younger children needed two sessions due to the lengthy demands of the various tasks. The time between sessions was no longer than two days. Some four- and six-year-olds needed more than two sessions to complete the Nurse's Role Task. This was due to the distracting hospital environment and/or fatigue of the child.

For contextual illustration of the data, one child of

each age level was chosen for further questioning if it appeared on the spot that he/she was well qualified verbally to explain his/her views of the nurse's role. For example, children who could express their thoughts in more detail instead of giving a bare-bones response were eligible for more in depth questioning (e.g., Child: "The nurse will bring her/him an extra blanket or will turn up the heat because the child is shaking and feels cold and the nurse cares." Experimenter: "Tell me more about why you think the nurse cares").

### Analyses

#### Quantitative analysis

Five analyses were done. An alpha level of .05 was used for all statistical tests. The five 4-year-olds were excluded from quantitative analysis because of the small number of 4-year-olds examined in this research. Consequently, quantitative analyses were conducted for three age groups (6-, 8-, and 10-year-olds) of ten subjects each ( $N = 30$ ). The first analysis focused on the developmental level of the child's understanding of the nurse's role as measured by the picture task. The answers given by the child were coded according to their level of functioning. The scores were submitted to a one-way analysis of variance. This test compares groups which differ on one independent variable (in this case age) with two or more levels (in this case three levels: 6-, 8-, and 10-year-olds). The dependent



variables were the child's obtained level scores on each nurse function as depicted by the 8 pictures of the Nurse's Role Task. In this analysis the null hypothesis and alternative hypothesis were,

Ho: the means of the 6-, 8-, and 10-year-olds coincide.

H1: the means of the 6-, 8-, and 10-year-olds differ.

While performing the analysis, the relationship between the variables was tested for changes in the slope to check for linearity. Subsequently, Newman-Keuls' test was conducted to make post hoc comparisons between means.

The second set of analyses examined the developmental level of causal reasoning as measured by the balance beam task. Children's level-scores of the balance beam task were submitted to a one-way analysis of variance (ANOVA). The one-way ANOVA compared the three groups, which differed on one independent variable (in this case age) with three levels (6, 8-, and 10-year-olds). The dependent variable was the child's obtained level score of causal reasoning as measured by the balance beam. In this analysis the null hypothesis and alternative hypothesis were,

Ho: the means of the 6-, 8-, and 10-year-olds coincide.

H1: the means of the 6-, 8-, and 10-year-old differ.

While performing the analysis, the relationship between the variables was tested for changes in the slope to check for linearity. Subsequently, Newman-Keuls' test was conducted to make post hoc comparisons between means.

The third hypothesis was tested by comparing the scores of the picture task with those of the balance beam task to see if there were significant differences in the child's level of understanding by performing a t-test for Case II research. This test examines whether the observed difference between two sample means arises by chance or represents a true difference between populations. The t-test compared the mean scores of the Balance Beam Task and the mean scores of the Nurse's Role Task for each age group to see if there was a significant difference between children's levels of understanding. In this case of a directional alternative hypothesis, the null hypothesis and alternative hypothesis were:

Ho: the mean score of the 6-, 8-, and 10-year-old child's understanding of the nurse's role is equal respectively to his/her mean score of causal reasoning.

H1: the mean score of the 6-, 8-, and 10-year-old child's understanding of the nurse's role is higher, respectively, than his/her mean score of causal reasoning.

Since a t-test was performed for each age group, three comparisons were made.

The fourth analysis examined the level of the child's intrapersonal knowledge as measured by the task of intrapersonal understanding (Griffin, 1992). Children's level-scores were submitted to a one-way analysis of

variance. The one-way ANOVA compared the three groups, which differed on one independent variable (age) with three levels (6-, 8-, and 10-year-olds). The dependent variable was the child's obtained level score of intrapersonal knowledge as measured by the Task of Intrapersonal Understanding. In this analysis the null hypothesis and alternative hypothesis were:

Ho: the means of the 6-, 8-, and 10-year-olds coincide.

H1: the means of the 6-, 8-, and 10-year-olds differ.

To check for linearity, the relationship between the variables was tested for changes in the slope.

Subsequently, Newman-Keuls' test was carried out to make post hoc comparisons between means.

The fifth analysis compared the scores of the Nurse's Role Task with those of the Intrapersonal Understanding Task to examine if there were significant differences in the child's level of understanding by conducting a t-test for Case II research.

In this case of a nondirectional alternative hypothesis, the null hypothesis and alternative hypothesis were:

Ho: the mean score of the 6-, 8-, 10-year-old child's understanding of the nurse's role is equal, respectively, to his/her mean score of intrapersonal understanding.

H1: the mean score of the 6-, 8-, 10-year-old child's

understanding of the nurse's role differs, respectively, from his/her mean score of intrapersonal understanding. A t-test was performed for each age group. Therefore, three comparisons were made.

#### Contextual illustration of the data

To illustrate the results obtained through quantitative analysis and to give the reader some background information or sense of the conditions under which the data were collected, a subsample of participating children was selected. One child of each age level (i.e., one 4-year-old, one 6-year-old, one 8-year-old and one 10-year-old) was chosen if it appeared that they were well qualified to explain their views of the nurse's role and if they showed a moderate advancement in their understanding of her/his role. These children were asked to talk a little more about their ideas. With the tape recorder running, probes were given and clarifications were sought, such as: "What do you mean by ....(idea mentioned by the child)? Tell me more about .... (idea mentioned by the child)." Narrative data, transcriptions and field notes including observations were used in the data analysis. The researcher made the field notes subsequent to visiting the child which described his/her specific characteristics such as appearance, behavior, physical condition, temperament, and personality.

The examiner interpreted the contextual findings with Case's (1992) theory of development in mind. The

predictions of his theory were also used to design valid scoring criteria for interpreting the data. These criteria are discussed in further detail in the next chapter.

## CHAPTER IV

### SCORING

Scoring criteria for the Nurse's Role Task, the Task of Intrapersonal Understanding and the Balance Beam Task were based on predictions from Case's (1992) theory of development. Several Neo-Piagetian studies (Goldberg-Reitman, 1984, 1992; Griffin, 1992; McKeough & Martens, 1994; Salter, 1993) along with one Piagetian study (Selman & Byrne, 1974) that examined the social-cognitive domain were consulted to describe the six level-scores for the Nurse's Role Task and the Task of Intrapersonal Understanding in order to obtain a complete outline of each level of understanding. Marini's (1984) criteria were used for scoring the Balance Beam Task. It should be noted that when the role of the nurse is discussed, it applies to the role of the "hospital" nurse.

#### The Nurse's Role Task

For clarity, the coding criteria are supplemented with examples of responses given by the four age-groups for each nurse's function. If elements of the child's answer to a story showed evidence of more advanced understanding of the hospital nurse's role, it was scored at the more advanced level. The 4- and 6-year-old children seemed to have difficulty in responding to the question about nurse's

thoughts. Either no answer was given, or a confusion between nurse's thoughts and feelings emerged such that the same response was given for both, or the child claimed she/he had already answered that question. Furthermore, contrary to Goldberg-Reitman's study (1992) which only included the mother's action(s) and the rationale behind her action(s) when scoring the child's answer, it was decided to include both the nurse's and the little girl/boy's action, feeling, and thinking with their rationale in the coding procedure. In other words, the child's total response to each story was considered in assigning a level score. This allowed the child to receive an optimal score for his/her total answer to the story because in most cases evidence of a higher level response was not found in the rationale for the nurse's action but in the rationale for nurse's feeling and/or thinking and/or in the little boy/girl's rationale for his/her action, feeling, and/or thinking.

All scoring was performed by the researcher. A second rater, blind to all features of the study except the scoring procedure, also rated to provide a measure of interrater reliability for the Nurse's Role Task, the Balance Beam Task, and the Task of Intrapersonal Understanding. The independent rater had a university degree and experience in educational settings. This rater was given the level characteristics. He was asked to study these, and was given practice items. When it was clear that the evaluation

process was understood, the rater was given 15 randomly selected protocols to score, 5 for each age group. No markings for age, chronic condition, or level scores were written on them, nor were they presented in any particular order. Completed stories could not be repeated. Interrater reliability was computed for each task.

Level scores correspond with the predictions of Case's (1992) theory of development. Level 1 corresponds to the third substage of the interrelational stage. Levels 2, 3, and 4 represent, respectively, the first, second, and third substage of the dimensional stage. Levels 5 and 6 correspond, respectively, to the first and second substages of the vectorial stage (see also Figure 1, p. 41).

Children's answers were coded according to the following guidelines adapted from Goldberg-Reitman's (1984, 1992), McKeough and Martens' (1994), Salter's (1993), and Selman and Byrne's (1974) studies.

Level 1 (4 yrs.): Roles of the Nurse as Scripted Actions.

- Appropriate predictions can be made by the child about the nurse's behaviour towards him/her. For example, the nurse will come to fill it (I.V. Bottles) up.
- The child can explain his/her answers by referring to the preceding situation in which he/she finds him/herself. For example, the nurse will come because the little girl/boy is crying.



- An appropriate knowledge of the nurse's action is demonstrated, and the rationale for such action concentrates on the little boy/girl's particular action or situation. For example, the nurse will help her/him find the teddy bear because he/she lost it.
- Both his/her predictions and explanations are still very basic, concentrating on only one aspect of the predicted action of the nurse or one aspect of the situation that caused it to happen.
- Children understand how the four categories of a scripted action (a setting, an initiating event, a response, and an outcome) proposed by Schank and Abelson (1977) are related to each other and intuitively are able to give answers that include all four categories. For example, the little girl/boy is sad because he/she lost his/her favourite teddy bear. The nurse comes to help the little girl/boy find the teddy bear. Little girl/boy is happy because the nurse found the teddy bear.

The subsequent tables (i.e., Tables 4 to 9) provide examples of typical levels 1, 2, 3, 4, 5, and 6 responses and can be interpreted as follows:

- The initial feeling of the little boy/girl refers to the first question asked of the subject after showing him/her the scenario (i.e., how do you think the little boy/girl will feel?).
- The left column shows the subject's response to how he/she

- thinks the nurse will act, feel, and think and, consequently, how he/she thinks the little boy/girl will act, feel, and think in the particular situation.
- The right column shows the subject's rationale behind the nurse's actions, feelings, and thoughts. That is, the researcher (R.) asks the subject the question: "Why will the nurse do, feel, and think ... (example given by subject)?" and "Why will the little boy/girl do, feel, and think ... (example given by subject)?"
  - If the researcher asked the child for further information, this was put between brackets (e.g., R. Why?).
  - From Tables 5 to 9 (i.e., examples for typical levels 2, 3, 4, 5, and 6 responses, respectively) distinctive level characteristics were put in italics and/or were further explained between brackets.

Examples from the data for typical level one protocols for one situation for each of the four nurse's functions are shown in Table 4. The ages and medical diagnoses of subjects are mentioned for each example.

Table 4

Typical Level 1 Responses

---

Category: Care (4-year-old girl with cystic fibrosis).

SITUATION: YUCKY AND GUCKY.

Initial feeling of the little girl:

- Wet.

Nurse's action/feeling/  
thinking

Action:

- Well clean...dry her bed.  
- She goes and puts the girl  
on the bed.

Nurse's rationale

(Researcher [R]. Why?)

- because ...change...her  
bed...change her bed.

Feeling:

- Sad.

- because she thinks that  
the girl is bad.

Thinking:

- Mad.

- because she thinks that  
the girl is bad.

Little girl's action/  
feeling/thinking

Action:

- Go to bed.

Little girl's rationale  
(R. Why?)

- because she is punished.

Feeling:

- Sad and lonely.

- because she doesn't have  
her mum.

Thinking:

- Bad.

-.....

---

Category: Protection (6-year-old boy with a congenital heart defect)

SITUATION: I.V. BOTTLES

Initial feeling of the little boy:

- Sad because he thought that was going to hurt him.  
...because he never had it before.

Nurse's action/feeling/  
thinking

Action:

- Come and help him. Tell

Nurse's rationale (R. Why?)

- because he is crying.

Table 4 (continued...)

him to stop crying. "Oh,  
stop crying."

Feeling:

- Probably sad.

- because he is crying.

Thinking:

- Crying a little bit.

- .....

Little boy's action/  
feeling/thinking

Little boy's rationale  
(R. Why?)

Action:

- Stop crying.

- because the beeping came  
off.

Feeling:

- Probably happy.

- because it's not beeping  
any more.

Thinking:

- Happy.

- because the beeping  
stopped.

---

Category: Nurturance (4-year-old boy with nephrotic  
syndrome)

SITUATION: Teddy bear.

Initial feeling of the little boy:

- I feel really bad.

Nurse's action/feeling/  
thinking

Nurse's rationale (R. Why?)

Action:

- She will try to find the  
muffi.

- because...because...  
because..he lost his muffi.

Feeling:

- She doesn't feel like  
anything.

- because....because ...  
she won't.

Thinking:

- She will think if she  
finds it then she will give  
it to the little boy.

- because...he doesn't..  
because he was..because he  
was looking for it.

Little boy's action/  
feeling/thinking

Little boy's rationale  
(R. Why?)

Action:

- He will cuddle with it.

- because he has his muffi

Table 4 (continued...)

	back.
Feeling:	
- He feels happy.	- because the muffi is going to be there.
Thinking:	
- He will feel very better.	- because he found his muffi.

---

Category: Teaching (4-year-old boy with nephrotic syndrome)

SITUATION: Hungry and thirsty.

Initial feeling of the little boy:

- Sad

Nurse's action/feeling/  
thinking

Action:

- She will give him a drink of water

Nurse's rationale (R. Why?)

- because he didn't have anything to drink. Oh, because he spilled something.

Feeling:

- He (=little boy) would feel sorry.

- because he can't have anything to eat or drink.

Thinking:

- I don't know.

- .....

Little boy's action/  
feeling/thinking

Action:

- He will get into bed.

Little boy's rationale  
(R. Why?)

- because he can't have anything to drink or eat.

Feeling:

- sad.

- because he can't have anything to drink.

Thinking:

- I don't know.

- .....

Level 2 (6 yrs.): Role of the Nurse as a Motivated  
Action Sequence.

- The child can coordinate two previously separate structures: a structure for examining external event sequences or scripts (A), and a structure for interpreting the nurse's intention or plan for a single event (B).
- If the child mentions that the nurse will perform more than one action, these actions are usually components of the same plan, not alternative plans.
- The nurse's immediate plans or intentions for the child's physical, emotional, and/or educational well-being are mentioned.
- The nurse pays attention to the little girl/boy's immediate observable needs that she/he believes the little girl/boy has. The nurse has plans for the little girl/boy's immediate future (e.g., The nurse will help the little boy/girl go back to his/her bed so he/she doesn't feel sick any more).

For example, a prototypic 6-year-old response for the category nurturance and the situation of the loss of the favourite teddy bear might be: "The nurse will try to find the teddy bear because she/he doesn't want me to be sad."

Examples of typical level 2 responses for one situation in each nurse's role category are tabled below (Table 5). The ages and medical diagnoses of the subjects are given.

Table 5

Typical Level 2 Responses

---

Category: Care (6-year-old boy with cystic fibrosis)

SITUATION: BLANKET

Initial feeling of the little boy:

- He should push his button like this...Like this...because the nurse will come. It beeps at the nurse's station and then he will say:"Can you give me another blanket, please, I am cold?"

Nurse's action/feeling/  
thinking

Action:

- So he is in five (child explains how a beeper works). She knows where five is, there is a button and there is a circle of five and then she knows which one because it is five...That's five and if you press then five lights up..Then she will go into five and help him and he will say:"I would like a blanket." Then she will go get him a blanket and then she will come back and she will say:"There are no blankets." So then she will get some shirts but his shirt is in the washer so she gets another one..Then he will get bare naked and she puts some hot water on him..She puts him in the sink and puts hot water on him.

Feeling:

- Happy.

Nurse's rationale (R. Why?)

- because he needs a blanket.

- because the blankets are getting washed.

- because *it will make him warmer (nurse's immediate plans)*...And he will put on his pyjamas and then he will get more hotter.

- because there are no blankets.

- because after his hot shower and hot bath and then he will go to sleep, he will say:"Oh, I feel warmer." No, maybe he has a water bed which is hot...more warmer.

Table 5 (continued...)

Thinking:	
- She thinks about "Blacky."	- because that is his teddy bear.
<u>Little boy's action/feeling/thinking</u>	<u>Little boy's rationale (R. Why?)</u>
Action:	
- He is going to sleep.	- because he is tired.
Feeling:	
- Happy. He will put a whole bunch of juices..a whole bunch of teddy bears, whole bunch of goodies..whole bunch of drinks and a whole bunch of chocolate milks....	- because that will make him happy.
Thinking:	
- He will be happy.	- because he got a lot of toys, a lot of goodies, a lot of candies.

---

Category: Protection (6-year-old boy with a congenital heart defect)

SITUATION: I.V. BOTTLES.

Initial feeling of the little boy:  
- Sad

<u>Nurse's action/feeling/thinking</u>	<u>Nurse's rationale (R. Why?)</u>
Action:	
- She will fill it up.	- to stop making it beep (nurse's immediate plan).
Feeling:	
- Happy	- because she filled it up for him to make it stop beeping.
Thinking:	
- She thinks that it came out	- because that's why he is crying.
<u>Little boy's action/feeling/thinking</u>	<u>Little boy's rationale (R. Why?)</u>
Action:	



Table 5 (continued...)

- He will stop crying.	- because she made it stop beeping.
Feeling:	
- Good.	- I don't know.
Thinking:	
- Put a bandaid on.	- because it is still in. (R. Why does he think it is still in?) I can't say any more. I don't want to say it any more. (R. Why does he think that?) Because she didn't put a bandaid on.

---

Category: Nurturance (6-year-old boy with asthma)

SITUATION: HUG.

Initial feeling of the little boy:  
- Sad because his mom is not there.

<u>Nurse's action/feeling/ thinking</u>	<u>Nurse's rationale (R. Why?)</u>
Action:	
- Call the mummy up and say: "Come over to the hospital."	- So the little boy will be happy (nurse's immediate plan).
Feeling:	
- She feels sad.	- because the boy is upset.
Thinking:	
- She will not think anything.	- because not....
<u>Little boy's action/ feeling/thinking</u>	<u>Little boy's rationale (R. Why?)</u>
Action:	
- Feel a little bit happier.	- that his mom is coming to the hospital.
Feeling:	
- Happy.	- because he wants a hug.

Table 5 (continued...)

Thinking:	
- He is thinking of her hugging him (the mom).	- because he got a hug.
<hr/>	
<u>Category</u> : Teaching (6-year-old boy with cystic fibrosis)	
SITUATION: HOSPITAL GOWN.	
Initial feeling of the little boy:	
- Not very good because he doesn't want to wear it. If he is not gonna wear it, she (the nurse) is mad.	
<u>Nurse's action/feeling/</u> <u>thinking</u>	<u>Nurse's rationale (R. Why?)</u>
Action:	
- She makes him put it on.	- Because <i>she</i> wants to warm him up ( <i>nurse's intention</i> ).
Feeling:	
- She doesn't feel very good.	- because she is mad. (R. Why is she mad?) Because he doesn't want to put it on.
Thinking:	
- I don't know what she will think.	- .....
<u>Little boy's action/</u> <u>feeling/thinking</u>	<u>Little boy's rationale (R. Why?)</u>
Action:	
- He will go and run around.	- to get real hot.
Feeling:	
- Not very good.	- because he doesn't <i>like</i> it.
Thinking:	
- I don't know.	- .....
<hr/>	

Level 3: Roles of the Nurse as Planned Action  
Sequences.

- Children understand that nurses may have more than one intention and that they may also choose among more than one possible action sequence to deal with the situation but their responses for the nurse's rationale are still very closely related to her/his actual behaviour.
- Children usually introduce a second focus in the nurse's actions and/or intentions.

For example, a prototypic level three response for the category teaching and the situation of the small operation might be: "The nurse will let me wear a hospital gown and will say you have to wear it because it is clean and is easier to take off."

Typical level three responses given by subjects are listed in Table 6. The ages and diagnoses of the children are again noted.

Table 6

Typical Level 3 Responses

---

Category: Care (8-year-old boy with cystic fibrosis)

SITUATION: BLANKET.

Initial feeling of the little boy:

- Cold.

Nurse's action/feeling/  
thinking

Action:

- Probably get him another blanket (*Action 1*) and turn up the heat (*A2*).

Feeling:

- Sad.

Thinking:

- She thinks that he wants another blanket.

Nurse's rationale (R. Why?)

- Because *she doesn't want the boy to be too cold (first intention of the nurse)*.

- because he is cold and that makes her sad.

- because *he is shivering and she doesn't like to see that (second intention of the nurse)*.

Little boy's action/  
feeling/thinking

Action:

- He will lay down in his bed and go back to sleep.

Feeling:

- Happy.

Thinking:

- She is nice.

Little boy's rationale  
(R. Why?)

- because he is tired and has his blanket.

- because the nurse helped him out.

- because she gives him another blanket.

---

Category: Protection (8-year-old boy with asthma)

SITUATION: BATHROOM

Initial feeling of the little boy:

- The boy feels bad.

Table 6 (continued...)

<u>Nurse's action/feeling/ thinking</u>	<u>Nurse's rationale (R. Why?)</u>
<p>Action:</p> <ul style="list-style-type: none"> <li>- She will give him medicine for the pain in his belly (A1) and give him a hug (A2).</li> </ul>	<ul style="list-style-type: none"> <li>- Because <i>she</i> wants him to feel better (first intention of the nurse).</li> </ul>
<p>Feeling:</p> <ul style="list-style-type: none"> <li>- Really really bad.</li> </ul>	<ul style="list-style-type: none"> <li>- because <i>she</i> wishes it didn't happen (second intention).</li> </ul>
<p>Thinking:</p> <ul style="list-style-type: none"> <li>- I don't know.</li> </ul>	<ul style="list-style-type: none"> <li>- .....</li> </ul>
<u>Little boy's action/ feeling/thinking</u>	<u>Little boy's rationale (R. Why?)</u>
<p>Action:</p> <ul style="list-style-type: none"> <li>- He will go to his bed</li> </ul>	<ul style="list-style-type: none"> <li>- because he wants to rest his stomach.</li> </ul>
<p>Feeling:</p> <ul style="list-style-type: none"> <li>- He will feel a lot more better.</li> </ul>	<ul style="list-style-type: none"> <li>- because the nurse gave him medicine.</li> </ul>
<p>Thinking:</p> <ul style="list-style-type: none"> <li>- He thinks that the nurse is nice.</li> </ul>	<ul style="list-style-type: none"> <li>- because she gave him the medicine.</li> </ul>

---

Category: Nurturance (8-year-old girl with pancreatitis)

SITUATION: TEDDY BEAR

Initial feeling of the little girl:

- The girl feels upset because she can't find her teddy bear.

<u>Nurse's action/feeling/ thinking</u>	<u>Nurse's rationale (R. Why?)</u>
<p>Action:</p> <ul style="list-style-type: none"> <li>- She will help her find her teddy bear and look for it.</li> </ul>	<ul style="list-style-type: none"> <li>- So <i>she</i> won't be upset (immediate plan of nurse to improve child's situation).</li> </ul>
<p>Feeling:</p> <ul style="list-style-type: none"> <li>- Oh she feels sad also.</li> </ul>	<ul style="list-style-type: none"> <li>- because <i>she</i> doesn't like the girl to be sad (first intention).</li> </ul>

Table 6 (continued...)

Thinking: - She thinks: "Poor girl, she lost her teddy bear, I better help her."	- because <i>she wants to help her (second intention)</i> .
<u>Little girl's action/feeling/thinking</u> Action: - She will start to calm down.	<u>Little girl's rationale (R. Why?)</u> - because she sees that they (the nurses) will find the teddy bear.
Feeling: - She feels better.	- because someone wants to help her find her teddy bear.
Thinking: - She thinks that this nurse is nice. She is helping me find my teddy.	- I don't know.
<hr/>	
<u>Category:</u> Teaching (8-year-old girl with chronic pyelonephritis)	
SITUATION: HOSPITAL GOWN	
Initial feeling of the little girl: - The girl feels like she doesn't want to do anything.	
<u>Nurse's action/feeling/thinking</u> Action: - The nurse will say that she has to do it...that she has to wear it.	<u>Nurse's rationale (R. Why?)</u> - because it is easier to operate because you can just lift it if you are doing it on the stomach and it might get bloody when they operate.
Feeling: - She is mad.	- because the girl won't do what <i>she wants her to do (first intention of the nurse)</i> .
Thinking: - She will get really really mad but she just doesn't	- because <i>she wants to sort of like to calm her down and</i>

Table 6 (continued...)

want to show it.

*help her without getting too mad at her (B2: second intention).*

Little girl's action/  
feeling/thinking

Little girl's rationale  
(R. Why?)

Action:

- She might start kicking the nurse.

- because she doesn't want to do it.

Feeling:

- She will like scared..No, she is already scared. She will feel....Yeh, she will be scared.

- because she doesn't want to get caught. (R. Why not?) because she doesn't want to.

Thinking:

- She will think that she has to do it but she still doesn't want to.

- because she is still scared. (R. For what?) She is scared for the surgery.

---

Level 4 (10 yrs.): Roles of the Nurse as Generalized Dispositions Toward Action.

- The child can conceive of several ways in which the nurse might react.
- The child can identify some more abstract qualities of the nurse. The child's description of the nurse as a person has a more psychological focus (e.g., the nurse helps children out because she is a nice person and she wants to help).
- The child can also identify and refer to a more abstract set of goals that will lead the nurse to choose a specific action sequence (e.g., caring, nurturing, loving, feeling sorry for). In other words, the nurse's actions are sometimes associated with the expression of internal states such as loving and caring.
- The child's response shows flexibility through the use of terms such as "perhaps," "probably," "maybe," "possibly." If such flexibility is not shown in this particular manner, the two or more distinct actions that the nurse might perform are presented in an "either/or" format. Even though 6-year-old children sometimes use words like "maybe" or "probably," their application usually refers to guessing what the nurse might, do, feel or think (e.g., the nurse probably feels angry).
- The prototypic 10-year-old child includes in his/her answer that the action of the nurse in any one situation



can be described as emerging from a series of potential actions and the nurse's rationale for her/his actions will have either underlying plans for the little girl/boy's future or the nurse's rationale will show an intention one step further removed from her immediate goals (e.g., the nurse will give the little boy/girl a blanket because she doesn't want the girl to get a cold so they can't do her/his surgery).

- Overall, the child can integrate multiple units identified at level three in some fashion.

For example, a prototypic level four response for the category care and the situation of the blanket might be:

"The nurse will bring her/him an extra blanket or will turn up the heat because the child is shaking and feels cold and the nurse cares."

Typical level four responses given by subjects of various ages for one situation in each of the four categories are listed in Table 7.

Table 7

Typical Level 4 Responses

---

Category: Care (8-year-old boy with cystic fibrosis)

SITUATION: YUCKY AND GUCKY

Initial feeling of the little boy:

- Sad because his bed is all messy.

Nurse's action/feeling/  
thinking

Action:

- She will *probably* clean his blankets and get him new ones.

Feeling:

- She feels sad.

Thinking:

- She thinks that he is sad.

Nurse's rationale (R. Why?)

- Because *she probably cares for him* and doesn't want him to be dirty.

- because he doesn't ...because he probably will not help her.

- because his dinner is spilled.

Little boy's action/  
feeling/thinking

Action:

- Say: "Thank you."

Feeling:

- Then he will feel happy.

Thinking:

- He thinks that *she is nice*.

Little boy's rationale  
(R. Why?)

- because the nurse is nice to help him.

- because the nurse cleaned it up for him.

- because she cleaned up the mess.

---

Category: Protection (10-year-old girl with a liver transplant)

SITUATION: BATHROOM

Initial feeling of the little girl:

- Scared. (R. Why?) That the nurse won't come and she has to throw up everywhere.

Table 7 (continued...)

<u>Nurse's action/feeling/ thinking</u>	<u>Nurse's rationale (R. Why?)</u>
<p>Action:</p> <ul style="list-style-type: none"> <li>- She will <i>probably</i> help her or something and then take her out and lay her down on her bed or something...<i>Probably</i> she will...I don't know</li> </ul> <p>Feeling:</p> <ul style="list-style-type: none"> <li>- It will make her <i>probably</i> feel better. It will make her feel really good. It will <i>probably</i> make the nurse feel better and the girl.</li> </ul> <p>Thinking:</p> <ul style="list-style-type: none"> <li>- I don't know</li> </ul>	<ul style="list-style-type: none"> <li>- Because the girl is crying and she (the nurse) <i>wants</i> to help because <i>she</i> cares and the girl doesn't feel so well.</li> <li>- because it makes her feel better for the girl because she is not in so much pain and it makes her feel better for the nurse because then the nurse doesn't have to look at the girl crying.</li> <li>- ....</li> </ul>
<u>Little girl's action/ feeling/thinking</u>	<u>Little girl's rationale (R. Why?)</u>
<p>Action:</p> <ul style="list-style-type: none"> <li>- She will <i>probably</i> just lie down or something.</li> </ul> <p>Feeling:</p> <ul style="list-style-type: none"> <li>- The little girl <i>probably</i> feels better.</li> </ul> <p>Thinking:</p> <ul style="list-style-type: none"> <li>- <i>Probably</i> the little girl is thinking about thanking the nurse.</li> </ul>	<ul style="list-style-type: none"> <li>- so she can rest.</li> <li>- because she got helped that's what she wanted.</li> <li>- because <i>probably</i> the little girl feels better that the nurse helped her.</li> </ul>

---

Category: Nurturance. (10-year-old boy with a benign tumor)

SITUATION: HUG

Initial feeling of the little boy:

- Awful. ...probably sad that he misses his mum.

Table 7 (continued...)

<u>Nurse's action/feeling/ thinking</u>	<u>Nurse's rationale (R. Why?)</u>
<p>Action:</p> <ul style="list-style-type: none"> <li>- She <i>probably</i> tells him to go to sleep and just, you know, calm down, your mum will be there in the morning.</li> </ul>	<ul style="list-style-type: none"> <li>- So that she doesn't have to give the kid a hug (R. Why not?). Oh she <i>might</i>, I don't know. <i>Maybe</i> she does, maybe she doesn't. <i>Maybe she doesn't want to hug him.</i> Maybe because the kid has been jumping around, going around in the dirt.</li> </ul>
<p>Feeling:</p> <ul style="list-style-type: none"> <li>- She <i>probably</i> feels like: "Oh come on, not again."</li> </ul>	<ul style="list-style-type: none"> <li>- because every situation here he is calling the nurse and things.</li> </ul>
<p>Thinking:</p> <ul style="list-style-type: none"> <li>- Okay, okay. I don't know. Maybe she'll think: "Well, don't be so sad."</li> </ul>	<ul style="list-style-type: none"> <li>- because <i>she doesn't like to be bugged by kids</i> a hundred times a day.</li> </ul>
<p><u>Little boy's action/ feeling/thinking</u></p> <p>Action:</p> <ul style="list-style-type: none"> <li>- <i>Maybe</i> cries his little head out.</li> </ul>	<p><u>Little boy's rationale (R. Why?)</u></p> <ul style="list-style-type: none"> <li>- because he doesn't have like...let's see here...he doesn't have his mum there but doesn't want to have a hug.</li> </ul>
<p>Feeling:</p> <ul style="list-style-type: none"> <li>- Maybe tired.</li> </ul>	<ul style="list-style-type: none"> <li>- because it is night time. You are supposed to be tired.</li> </ul>
<p>Thinking:</p> <ul style="list-style-type: none"> <li>- He probably thinks: "Uh, I wish my mum was here."</li> </ul>	<ul style="list-style-type: none"> <li>-Yeh, you know, maybe he misses her, maybe she wasn't there with him that day.</li> </ul>

---

Category: Teaching (8-year-old girl with multiple chronic conditions)

SITUATION: HOSPITAL GOWN

Table 7 (continued...)

Initial feeling of the little girl:

- She feels sad and angry.

Nurse's action/feeling/  
thinking

Action:

- The nurse will say: "You have to wear it or else you won't get better because you need the operation and you need to wear this gown for it."

Nurse's rationale (R. Why?)

- Because if she wants her own pyjamas because her pyjamas don't open at the back then they can't...then she ..then they wouldn't be able to do the operation on her. So they can't do the operation. (R. Why not?) Because her own pyjamas don't open anywhere. They can take them off but I don't think she wants to be naked though. (R. Why else does the nurse say that?) Because she is in the hospital.

Feeling:

- She will feel sad.

- because *she feels sorry* for the little girl that she has to and she has to wear one of the hospital gowns and she doesn't really want to.

Thinking:

- *Sorry for her...*but she will think that the little girl might not want to wear it.

- Because the little girl doesn't like the hospital gowns because she likes her own pyjamas because they are warm and cosy.

Little girl's action/  
feeling/thinking

Action:

- She will start crying as loud as she can.

Little girl's rationale  
(R. Why?)

- because she doesn't want to wear them...she doesn't like them...because it opens at the back and hers doesn't and it might show her underpants and she might not like that either.

Table 7 (continued...)

Feeling:

- She will feel angry at the nurse.

- because she hates the hospital pyjamas, she doesn't like to put them on because...uhum.. they are too loose.

Thinking:

- The girl thinks that she doesn't have to wear the hospital pyjamas because...

- because her pyjamas are still pyjamas and the hospital's are pyjamas too because they are both pyjamas.

---

Level 5 (12 yrs.): Roles of the Nurse as Demonstrating  
Logically Planned Decisions towards Action.

- Children's responses show evidence of not only "intentional reasoning" but also "interpretive reasoning" (McKeough & Martens, 1994) (i.e., the nurse's action is explained in terms of personal history and/or long-standing psychological traits). Whereas 10-year-old responses are more intentional in nature (i.e., the nurse's action is accounted for on the basis of mental states that encourage it, such as feelings, motives, desires or judgements), 12-year-old responses show evidence of being able to describe the nurse's or little girl/boy's action in a way that goes beyond the immediate situation and to consider longer-term psychological factors such as past experiences that might have influenced the nurse's life and shaped her/his current behaviour.
- Children not only realize that the nurse has a choice of more than one action for any one nurse's function, but they also have a clear idea of how the nurse decides to react towards the child. More specifically, children at this level see both the nurse and the little girl/boy as being of a certain "type" determined by their own history, previous experiences, mood, knowledge, and so forth. The nurse's type responds to the little girl/boy's type and this guides the nurse's

actions. The nurse is seen as an abstractor of evaluations of the little girl/boy's past, internal state, and future.

- The child is also able to describe the nurse's personality in terms of the more enduring state or the type of person she/he is due to influences and events (e.g., the nurse does that for the kid because she is nice and that is the kind of person she is).
- The child can express empathy or awareness of how certain behaviour would have an impact on her/himself and, consequently, how this behaviour might also have the same impact on others (e.g., I feel scared when the nurse gives me a needle so the little girl probably feels scared too). This is called "self/other conscious projection" (McKeough & Martens, 1994); the child can project how his/her own feelings might be felt by others, in this case the nurse and the little boy/girl in the story. They can relate both the nurse's and the little girl/boy's actions, feelings, and thinking to their own life experiences.
- The nurse reacts because it is her/his patient, whom she/he cares for and who needs or wants something. The possessive relationship between the nurse and her/his patient is a causal factor at this level (e.g., the nurse feels that the little girl/boy is her/his responsibility or it is her/his duty to help the little girl/boy).
- The child's response may show evidence of



metacognitive thinking (e.g, the nurse thinks that the little girl might think that the operation might hurt). The child is able to take a metaposition to the feeling/thinking/action of the nurse (e.g., it would bother her conscience if she/he did not help the little girl/boy.)

- The child can go beyond the two-person situation and look at it from a third-person perspective. The child takes the role of the spectator.

For example, a prototypic 12-year-old response for the category care and the situation of the blanket might be: "The nurse will bring the little boy/girl an extra blanket because she knows out of her own experiences how cold it can be in a hospital and she doesn't want her patient to get more sick because the child is her responsibility."

Even though 12-year-olds were not included in this study, several younger subjects showed advanced understanding of the Nurse's Role which made it necessary to incorporate this level. Examples from typical level 5 protocols for one situation in each of the four nurse's functions are given in Table 8. The ages and medical diagnoses of the subjects are presented for each example.

Table 8

Typical Level 5 Responses

---

Category: Care (10-year-old boy with hypospadias)

SITUATION: YUCKY AND GUCKY

Initial feeling of the little boy:

- He feels like he wants to take a bath. He feels like..he thinks he is in trouble because he spilled his food and then he thinks oh...oh... I am in pain and I have to get out of the bed so they can change my bed and I don't have any more food to eat. But he doesn't need to worry about that because the hospital is going to bring him food. So that's why.

Nurse's action/feeling/  
thinking

Action:

- Well, she will tell him that it's okay.. you don't need to get out of bed..you just stay there..we will just take the front sheet off and we will fix everything.

Nurse's rationale (R. Why?)

- So the kid won't be hungry any more and he'll be..he won't need to worry about the mess he made. He won't have to be scared that he is in trouble.

Feeling:

- Then she will feel like...well I don't know what she will feel like but I will take a guess and she would feel sort of ..she will feel like giving a pat on the back.

- So he doesn't have to worry any more. Nothing is wrong and so the boy won't cry or anything or be sad.

Thinking:

- Well *she thinks that the kid is not going to cry again...because he knows it's okay (metacognitive thinking)* and she thinks about what she should get for the kid to eat...And she thinks..should she ask him or should she just go and get him something to eat. And she thinks again if she should first get the food or first change the sheets.

- So she knows what to do. She doesn't get mixed up.

Table 8 (continued...)

Little boy's action/  
feeling/thinking

Little boy's rationale  
(R. Why?)

Action:

- The boy will help the nurse take the sheet off and when the food comes he will get in his new bed and this time he'll eat careful.

- So he doesn't spill it again.

Feeling:

- Well then he will feel more careful. And then he will feel good that he spilled it.. that it is not his fault and then he will feel okay. He doesn't need to worry about anything.

- because he doesn't need to worry about anything.

Thinking:

- he will think..he gets a second meal for free.

- because the other kids always get one meal and he gets to get two meals because he spilled it and he ate half of his first meal and spilled the rest..so he gets a whole meal and a half. Yeh and he tries to show off ...like... I get more food than you guys...ha...ha...Yeh he shows off with his partner (child takes role of spectator).

---

Category: Protection (8-year-old girl with multiple chronic conditions)

SITUATION: I.V. BOTTLES

Initial feeling of the little girl:

- She might think that the machine..that she might be getting really sick and that she might start to go...like she might start to die because the machine is beeping and she might think that the machine is getting her really sick.

Table 8 (continued...)

Nurse's action/feeling/  
thinking

Action:

- The nurse does..the nurse fixes it..and then she goes:"It's alright, nothing is going to happen." She presses the buttons. (R. What else will she do?) Well she talks to the girl and she says:"It's alright because it is just the machine because the bags are getting empty."

Feeling:

- I don't know.

Nurse's rationale (R. Why?)

- because the buttons stop it from beeping.

-.....

Thinking:

- *She thinks that the girl might be thinking that..well she might have to get a new needle..a new needle or something. She might get it in her hand or her arm because my hands are free.*

- because the girl is really crying loud and she is panicking. *The nurse might think that she is thinking that she needs a new needle (metacognitive thinking).*

Little girl's action/  
feeling/thinking

Action:

- She stops crying and will calm down.

Little girl's rationale  
(R. Why?)

- because the nurse is trying to calm her down because nothing is going to happen. She won't need a new needle or anything.

Feeling:

- She feels weird

- because she feels weird after she was panicking because now she knows that she was...I can't really concentrate (little children are crying in her room).. because now she knows that she doesn't have to panic and she felt weird because she was yelling and crying and stuff.

Table 8 (continued...)

Thinking:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>- She thinks that it is o.k. and it is just because of the bottle.</li> </ul> | <ul style="list-style-type: none"> <li>- She thinks that... because...because.. I don't know why.</li> </ul> |
|--|--|

---

Category: Nurturance (10-year-old boy with Guillain-Barre Syndrome)

SITUATION: Teddy bear

Initial feeling of the little boy:

- Terrible.....probably terrible. He would probably think:"Where is my teddy?"

Nurse's action/feeling/  
thinking

Action:

- She would probably look around the room. Or report it. You know, the hospital will probably put it on the announcement or something. It would say:"Have you seen this teddy?"

Nurse's rationale (R. Why?)

- Maybe she feels really nice and she ...maybe because that's her job.

Feeling:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>- Stressed out.</li> </ul> | <ul style="list-style-type: none"> <li>- because she has to search all over the hospital for this little teddy that is about the size of that (points at his own teddy).</li> </ul> |
|---|---|

Thinking:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>- Probably...probably.. you know she would say:"Okay, I might as well ask another nurse to do it."</li> </ul> | <ul style="list-style-type: none"> <li>- because <i>you wouldn't want to do this (relating to one's own situation)</i>. Go through the whole hospital through everywhere to find this teddy bear.</li> </ul> |
|--|--|

Little boy's action/  
feeling/thinking

Action:

- He will probably just sit there and worry.

Little boy's rationale  
(R. Why?)

- because he knows he is not allowed to go around the hospital.

Table 8 (continued...)

Feeling:

- He will probably be...probably he will feel really like...really nervous.

- She might find it or she might not.

Thinking:

- He will probably think...he will probably feel that the nurse is pretty nice.

- because she is going all around the hospital to find this teddy for him.

---

Category: Teaching (10-year-old girl with cystic fibrosis)

SITUATION: Hospital gown.

Initial feeling of the little girl:

- Oh disgusted because she doesn't want to wear it and she is mad and angry and probably she is already feeling sorry for herself because she has to be in the hospital anyway.

Nurse's action/feeling/  
thinking

Action:

- She will probably say:"You will have to, you have to have this surgery, you know that you have to have the operation and you know you have to wear it...the doctors want you to (third person involved in the story)

Nurse's rationale (R. Why?)

- Because it is lighter and it isn't such as heavy material so it's easier to work with. And I don't mean not with...uhum like it's easier to listen through with a stethoscope and that type of stuff....

Feeling:

- Oh kind of a bit angry with her.

- Because lots of the kids just go into it (comparison with other kids). And probably trying to help her and she will probably try to help her and soothe her into it, right? And say:"It's o.k., it's not gonna bite or anything, right?"

Thinking:

- She will probably think:"Oh, this girl is a little stubborn. But I mean,

- Because it is embarrassing to wear a gown like that.

Table 8 (continued...)

huh, I don't blame her. I have had to go into that one and you can see your behind and every thing." So she is thinking that in her head (*refers to past experience of the nurse*)

Little girl's  
action/feeling/thinking

Action:

- She might get into it or she might still refuse.

Feeling:

- Probably different

Thinking:

- Well maybe she is right

Little girl's rationale  
(R. Why?)

- Uhum, because I wouldn't know what to do...(*refers to her own situation*)

- Like...the nurse cares for her. Probably she sees that the nurse kind of cares for her and that...and it's only for her own good...she realizes that (*metacognitive thinking*) and then she probably gets into it.

- Because that's...it's a lot easier with that... and that's what the doctor wants, right?...and it's for my own good.
-

Level 6 (14 yrs.): Roles of the Nurse as Demonstrating Logically Planned Action Sequences.

- The child is not only able to interpret both the nurse's and little girl/boy's actions, feelings and thinking but also can express alternate possibilities for his/her interpretation. This level shows similarities with level 3 in the sense that, at level 3, the child can give more than one *intention* for the nurse's and little boy/girl's behaviour whereas at level 6 the child can express more than one *interpretation* for the nurse's behaviour and little boy/girl's behaviour.
- The child can not only relate the nurse's and/or little girl/boy's behaviour, feeling and/or thinking to their own life experience but he/she also recognizes another possible context. In other words, the child includes not only him/herself in interpreting the situation the little girl/boy and nurse are in but also generalizes his/her own action, feeling and thinking to other people. The child includes a fourth and/or fifth person in the story (besides the nurse, the little girl/boy and him/herself). For example, "The nurse might not want to see the little boy/girl in pain because I wouldn't like to see another person suffer. Like when I am in pain, both my mother and my father were very sad. My mother cried a lot and my dad didn't know what to do."
- The child is able to give an alternate interpretation



and/or a second focus to an abstract notion. For example, the nurse feels responsible (abstract notion) for the little girl/boy because it is *not only* her patient she needs to take care of *but she also* wants the child to get better.

- Overall, the child can express multiple perspectives/ dimensions to the interpretation.

Despite the fact that 14-year-olds were not included in this study, it was noticed that some younger subjects gave answers at this level. Examples of their answers and their actual ages and medical diagnoses are given in Table 9.

Table 9

Typical Level 6 Responses

---

Category: Care (10-year-old boy with a benign tumor).

SITUATION: YUCKY AND GUCKY.

Initial feeling of the little boy:

- He feels dirty and not clean and like:"Oh, get this food off my bed."

Nurse's action/feeling/  
thinking

Action:

- Probably clean the mess up. She will probably pat him on the back... and then he will probably throw up.

Nurse's rationale (R. Why?)

- because that is her job...No, she wouldn't, she would get the housekeeper to clean it up. And also he feels really yucky and the food, you know..., throw up... he has probably eaten too much food.

Feeling:

- She will probably feel pretty crappy.

- because she has to clean up his mess and help him throw up and clean up the throw-up...and....

Thinking:

- She *feels like a slave* (abstract analogy).

- maybe because, you know, *he calls her a hundred times a day (first interpretation) .. no..and they don't get presents ... all the little kids get presents and they have to serve the little kids (second focus on interpretation).*

Little boy's action/  
feeling/thinking

Action:

- He will probably go to sleep.

Little boy's rationale  
(R. Why?)

- because, you know, he is tired... you know, he has to have a little rest.

Table 9 (continued...)

Feeling:

- Well after he sleeps...  
better.

- because he threw up and he  
had a rest and things.

Thinking:

- He thinks it's really bad  
that he threw his food all  
over the bed.

- because he threw his food  
all over his bed.

---

Category: Protection (10-year-old boy with hypospadias)

SITUATION: BATHROOM

Initial feeling of the little boy:

- Makes him feel well...it makes him feel worried because he  
is afraid that the nurse might not hear him and not come.

Nurse's action/feeling/  
thinking

Nurse's rationale (R. Why?)

Action:

- The nurse will try to  
..the nurse will first knock  
on the door..see what...why  
is he calling.  
- She will go and get him  
aspirin probably.  
- She will try to get the  
kid to go in his bed and  
uhum...have him..have him  
not cry any more.

- so she knows if it is  
serious or not.

- so the pain will go away.

- so the kid won't cry and  
not..so he won't be worried  
any more.

Feeling:

- Makes her feel good...

- because she made him stop  
crying (first  
interpretation). She  
completed something because  
she is like...she has done  
the mission (abstract  
notion, analogy of  
"completing something")...  
like when you are on a  
mission and if you finish  
it..you feel good that you  
did the job and you didn't  
screw up or anything (second  
interpretation).

Table 9 (continued...)

Thinking:

- Well that she ..she is afraid that she might not know what to do...and she might lose her job.

- because she doesn't know what to do. Because she is worried that she can't do anything and she might lose her job. Yeh...because she needs her job and if she can't do anything and she learned about that..then that means that she hasn't been listening in class and she could just lose her job..to think that.

- (R. Why else?) *because she has listened in the class but the doctor (third character involved in story) will think that she hasn't been and the doctor will think that she is not a good nurse. She might lose her job and she should know what to do but she doesn't ..That's what she is worried about.. she is afraid that she will forget what she is supposed to do..Yeh she will forget what to do.. that's what she is afraid of.*

Little boy's action/  
feeling/thinking

Action:

- Well he will sort of calm down and won't cry any more and he'll tell the nurse what's wrong.

Little boy's rationale  
(R. Why?)

- so the nurse would help him and the pain will go away. So the nurse would give him an aspirin and the pain would go away.

Feeling:

- Then he will feel...well better.

- because the pain is gone.

Thinking:

- Then he will..he doesn't think..he just feels comfortable then.

- because he doesn't need to think if he feels comfortable or not because he already knows he is because the pain is gone.

Table 9 (continued...)

Category: Nurturance (10-year-old girl with cystic fibrosis)

SITUATION: HUG

Initial feeling of the little girl:

- Probably lonely because I know how that feels. I felt like that a lot yesterday. Because my mum wasn't there and I usually have the comfort of her to help me. Yeh. She kisses me good night and she helps me get to sleep. Thinking that she is there just helps me get to sleep, right? No...well not last night but the night before and especially the first... the first night I was really upset that I couldn't get to sleep (*first interpretation of the feeling "lonely"*). Yeh and also ....Yeh, that's what I felt when my dad had to go on the airplane... I really really missed him and I started to cry... And the nurses asked me why I was crying. And I said:"Oh, I am just cold because I didn't really want to tell them because they might think I was a baby or something." (*second interpretation of the feeling "lonely"*) But now that I think about it.....

Nurse's action/feeling/  
thinking

Action:

- She will probably give her a hug like she wanted....and comfort her.

Nurse's rationale (R. Why?)

- because she cares for the girl. Like I said before.

Feeling:

- That will make her feel that she helped some one and ... warmer towards the girl.

- because she helped her. It's hard to explain.

Thinking:

- Probably..oh poor little girl.. she is missing her mum.

- because she is missing her mum and she is crying and looks like that.

Little girl's action/  
feeling/thinking

Action:

- She will probably feel a lot better...she might not feel totally better because it isn't really her mum. It's the nurse but she probably still feels better. And then probably goes to

Little girl's rationale  
(R. Why?)

- because she feels a little bit better.

Table 9 (continued...)

sleep.

Feeling:

- She will probably feel a lot more comfortable with the nurse...just like all the other stories....she will probably feel better.

- *because she comforted her.*

Thinking:

- Well she'll probably think: "Well my mum is going to come back tomorrow anyway so I will be seeing her then *she will probably look at the positive side instead of the negative side (alternative way of thinking).*"

- *because she is feeling better.*

---

Category: Teaching (10-year-old boy with a benign tumor)

SITUATION: HUNGRY AND THIRSTY

Initial feeling of the little boy:

- "A little hungry."

Nurse's action/feeling/  
thinking

Action:

- She will say "no."

Nurse's rationale (R. Why?)

- Because it is a special examination and you can't eat. Maybe they want you not full with food because they had to search through all the stuff up here and they had to move some over and if this thing (stomach) will obviously easy to push over because it is not loaded with food. They had to push it over... and like you can't do that.

Feeling:

- It makes her feel kind of mean not to let him eat anything.

- because you know, she can't give him anything and she feels like she is not

Table 9 (continued...)

<p>Thinking:</p> <p>- "I can't let him have anything to drink."</p>	<p>doing her job.</p> <p>- because that's why... doctors (<i>fourth person involved in the story</i>) said before the exam "not to eat or drink" and they have to obey the doctors otherwise they get fired. And then they have to go to college to get a new job. They have to listen to the doctors. The doctors know...It's like kings and queens (<i>analogy</i>). Doctors are like the kings and nurses are like queens that... They know what they are doing ...that's why they have the power to order people around (<i>abstract thinking</i>).</p>
<p><u>Little boy's action/feeling/thinking</u></p> <p>Action:</p> <p>- He will probably throw a fit.</p>	<p><u>Little boy's rationale (R. Why?)</u></p> <p>- because the nurse is not giving him anything and he wants it. He knows they won't give him anything.</p>
<p>Feeling:</p> <p>- He will feel kind of angry inside.</p>	<p>- I would get mad if I asked for a drink and she said "no" (<i>interpretation to his own situation</i>).</p>
<p>Thinking:</p> <p>- He'll say..he'll always...well..she is the nurse for the day, right..so when he gets his next nurse..and then maybe he gets that nurse again, that didn't give ..that said "no" to him to the drink..he thinks he can't have anything to drink maybe.</p>	<p>- because she said "no" the last time. He probably looks at her and is probably pretty mad at her that she didn't give him a drink.</p>

Interrater reliability for scoring the protocols was .92 (ranging from .88 for the scenario "teddy bear" to .95 for the scenario "hug").

#### Task of Intrapersonal Understanding

The criteria for scoring the answers of the "Meaning" Tasks as proposed by Griffin (1992), McKeough and Martens (1994), and Salter (1993) were as follows:

A score of 1 was assigned if:

- A child only mentioned observable events (B), external actions or objects (e.g., "Sad" means you cry and you want to go home; "happy" means you can go home from the hospital and eat cake; "good" means you get presents)
- If a child exclusively mentioned an intentional state (F) without referring to a behavioral event related to the intentional state (e.g., "happy" means you are feeling good, you are lucky).

A prototypic level 1 response given by a 4-year-old subject is: "Good" means: "I make a picture for my mum (B). You get new stuff and you play with new stuff (B)."

A score of 2 was given if:

- The answer contained both a behavioral event and one of the following related intentional dimensions: (a) feeling (F) states (e.g., " 'Sad' means feelings. I feel sad when my best friend doesn't want to play with me").  
(b) personal judgement (J) (e.g., " 'sad' means that you are really upset -- when you don't get the present you



wanted to get for your birthday"), (c) others' judgements (J) (e.g., "Being 'good' means that you do the work your teacher wants you to do"), (d) social judgments (J) (e.g., " 'Good' means that you listen to what your mommy wants you to do").

A prototypic answer given by a 6-year-old subject is: "Happy" means: "You are playing with somebody (B) and it means that you are just happy because you aren't lonely (F). You play and you eat (B)."

A score of 3 was assigned if:

- The answer consisted of a behavioral event and two distinct intentional dimensions. There are several forms such responses can take. One form is that the answer consists of a coordination of an event with a feeling state and a judgmental perspective (B + F + J) (e.g., " 'Happy' means if you like something you do, you really feel happy"). Another form is that the answer consists of a coordination of an event with two judgmental perspectives that are categorically different (B + J + J) (e.g., "Being happy means when I like the things I am doing, like walking my dog every day, and I am not doing anything I don't want to do").

A prototypic level 3 response given by an 8-year-old subject is: "Happy means: You are laughing, you got what you wanted and there is something you like (B + J + J)."

A score of 4 was given if:

- The answer consisted of a behavioral event and more than two coordinated intentional dimensions (e.g., "being bad means that you are not listening to your mom and that you are willing to do bad stuff and you want to hurt somebody").

Griffin (1992) did not include 10-year-olds but it can be hypothesized that children at the 10-year-old level can elaborate on the units that are coordinated at the 8-year-old level (Case, 1992).

A prototypic level 4 response given by a 10-year-old subject is: "Sad" means: "When nobody likes you, when people call you names, when they gave you put downs then you start crying (B + J + J + J)."

A score of 5 was given if:

- The answer not only consisted of a behavioral event and more than two coordinated intentional dimensions but also showed evidence of interpretive reasoning (McKeough & Martens, 1994). For example, "Bad means if you steal someone's possessions because no one has the right to do that. Like it wouldn't make you feel good if some one stole your favourite stuff." Or, "My conscience usually bothers me if I do something bad."

Even though 12-year-olds were not included in this study, some younger subjects' responses showed evidence of a more abstract level of intrapersonal understanding

characteristic of the first and second substages of the vectorial stage. Therefore, it was decided to include levels 5 and 6. Griffin's study did not describe these levels. Consequently, scoring criteria for these levels were adapted from McKeough's and Martens' (1994) study and Salter's (1993) study.

A prototypic level 5 response given by a 10-year-old subject is: "Bad" means: "To do drugs..to smoke..to disobey the law ..uhum...to push people around and you are willing to do bad stuff. When you drink beer when you are only ten (interpretation of disobeying the law). That's disobeying the law...You have to be over eighteen. You are not listening to your conscience (voice within)."

A score of six was given if:

- The child could describe an abstract notion and could give an alternate interpretation and/or a second focus to this notion.

A prototypic level 6 response given by a 10-year-old subject is: "Good" means: "To behave yourself and be helpful to anybody who needs help or just be helpful and also cooperatively (abstract notion)...like I am now with you (first interpretation of being cooperative)...with anybody that needs your cooperation. Uhum...I usually feel good inside also...like happy inside when I am good. Like some days I wake up early and I get dressed and I go downstairs and I set the table and everything without anybody knowing

and then I do my breathing (subject needs to do breathing exercises for her cystic fibrosis) and then I get back upstairs and go to my room and start reading and nobody knows that I did that. I feel happy inside when they tell me: 'Oh thanks E..' Then I feel really happy because...I have been thanked (second focus on being good, cooperative, helpful)."

The fourth question was categorized as to whether children cite an internal or external source for their feelings. This question is referred to as the "Source" Task because it requests the source for each intentional state (e.g., "When you are not listening to what your mom wants you to do, where do you think the badness comes from?"). Responses were scored as coming from an internal source whenever the intentional state was seen to be located within the physical or psychological self (e.g., "It comes from my heart, my brain, my feelings"). Responses were scored as coming from an external source whenever the intentional state was seen to be coming from an object, an action, or a part of the body that could be observed from the outside (e.g., "It comes from my mom, from my tears, from everybody else"). Responses that fell in neither the internal nor the external source category were put into an "I don't know where it comes from" category.

Interrater reliability was computed for the four concepts happy, sad, good, and bad at .81, .89, .95, and

.96, respectively.

#### Balance Beam Task

Subjects were expected to make predictions and give justifications that reflected the strategy used to coordinate the dimensions of weight and distance (Marini, 1984). In order to pass an item the relationship between the prediction and justification had to be very clear. An answer was assigned the score of a particular level only if the prediction was sufficiently explained by the justification (see also Table 1, p. 39).

Considering the fact that two trials were given at each level, a child's final score was calculated by adding up the total number of level scores and dividing it by two. A level 5 (i.e., approximately age twelve) was also included to prevent a ceiling effect. Interrater reliability for the Balance Beam Task was calculated at .95.

#### Summary

Six level scores were described to provide a comprehensive and structured basis for scoring children's responses on the Nurse's Role Task and the Task of Intrapersonal Understanding ranging from mainly script-based responses characteristic of levels 1 and 2 to the more interpretive responses characteristic of levels 5 and 6. Examples of responses at each level were given. Some 8- and 10-year-olds were able to also give answers at levels 5 and 6 (i.e., approximately age 12 and 14, respectively). Five

level scores were obtained for the Balance Beam Task. After all scoring was completed and an interrater agreement was calculated, the quantitative analyses were performed. Results of these analyses are described in the next chapter.

## CHAPTER V

### RESULTS

Thirty-five hospitalized children (five 4-year-olds, ten 6-year-olds, ten 8-year-olds and ten 10-year-olds) with various chronic conditions were given the Nurse's Role Task, the Task of Intrapersonal Understanding and the Balance Beam Task. Half-way through the data collection it was decided to discontinue recruiting 4-year-olds for the study. It was very difficult for them to complete all three tasks for several reasons. First, the short length of hospitalization often made it impossible to spread the tasks out over the several sessions which were needed to keep the 4-year-old child concentrated. Second, the distracting hospital environment did not provide an optimal situation to do three lengthy tasks. The Nurse's Role task, in particular, took them too long. They generally lost interest in the task rather quickly. Their response to the protocols will be discussed in the section, "The contextual description of the data."

All children were interviewed at their bedside and were given a present after they completed all tasks. Presents awarded were plush animals, drawing books with crayons, little toy cars and pencils. Interviews were tape recorded and then transcribed. The majority of children referred to

the role of the nurse as that of a woman instead of a man.

For clarity, the results will be presented in two parts, addressing the quantitative and the contextual description of the data, respectively.

#### Results of quantitative analyses.

Five analyses were done. The 4-year-olds were excluded from quantitative analyses because of the number of children interviewed in the age group. Consequently, there were three age groups (6-, 8-, 10-year-olds) of ten subjects each for quantitative analysis. Results of the five analyses will be presented in five parts, addressing the five research questions initially set out. An alpha level of .05 was used for all statistical tests.

Question A. Do the mean level scores of Case's stages of cognitive development coincide with the mean scores of children with chronic conditions on their perception of the hospital nurse's roles (i.e., care, protection, nurturance, and teaching)?

To address this question, overall means (with standard deviations in parentheses) for the 6-, 8-, and 10-year-olds on the Nurse's Role Task were computed; these were 2.06 (1.18), 3.35 (0.11), and 4.3 (1.06), respectively. The reader will remember that the predicted scores according to Case's (1992) theory of development for 6-, 8-, and 10-year-old children are 2.00, 3.00, and 4.00, respectively. These predicted scores will be graphically represented in the



related figures as the theoretical line. The age means for each nurse function are plotted in Figure 3. Furthermore, the mean scores for each age group on the eight pictures are graphically depicted in Figure 4. In addition, the mean scores and standard deviations for levels by each age group and by each situation within each nurse function category is presented in Table 10. Figure 5 presents the range of performance of each age group (6-, 8-, and 10-year-olds) on the Nurse's Role Task.

Children's level scores on the nurse's role task were initially submitted to a one-way analysis of variance. Results of this analysis indicated that the effect of age was statistically significant,  $F(2, 27) = 26.32$ ,  $p = .001$ . The power of this analysis was 0.998.

Furthermore, Newman-Keuls' comparisons of means were performed to determine where significant differences among age groups were to be found. It appeared that there was a consistent age-related increase in children's understanding of the hospital nurse's role; significant differences were found in overall mean scores between each of the three age groups. A test of linearity showed a linear trend in the data,  $F(2, 27) = 52.30$ ,  $p = .001$ . No significant deviation from the linear trend was apparent,  $F(2, 27) = 0.34$ ,  $p = .565$ .

In order to check if there were any effects for function and pictures, an analysis of variance of a mixed

TABLE 10

Mean Scores and Standard Deviations for Levels by each

Age Group and by each Situation within each Nurse Function

Category

Nurse Function Category

<u>TEACHING</u>				<u>PROTECTION</u>				<u>NURTURANCE</u>				<u>CARE</u>													
<u>H. GOWN</u>		<u>THIRSTY</u>		<u>H &amp; T</u>		<u>BATHROOM</u>		<u>IV</u>		<u>B &amp; IV</u>		<u>TEDDY</u>		<u>HUG</u>		<u>T &amp; H</u>		<u>YUCKY</u>		<u>BLANKET</u>		<u>Y &amp; B</u>			
<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
<u>AGE</u>																									
6 YRS.		2.30	0.82	1.90	0.32	2.10	0.01	2.10	0.74	2.20	0.79	2.15	0.04	2.20	0.92	2.30	0.82	2.25	0.14	1.70	0.48	1.80	0.63	1.75	-0.19
8 YRS.		3.20	0.63	3.50	0.85	3.35	-0.03	3.30	0.82	3.40	1.26	3.35	-0.05	3.70	1.25	3.30	0.82	3.50	0.10	3.10	0.88	3.20	1.03	3.20	-0.03
10 YRS.		4.30	0.95	4.50	1.27	4.35	0.02	4.40	0.97	4.30	0.95	4.35	0.04	4.10	1.29	4.10	1.10	4.10	-0.25	4.50	0.97	4.30	0.95	4.40	0.22
Note. n = 10 for each age group.																									

Note. n = 10 for each age group.

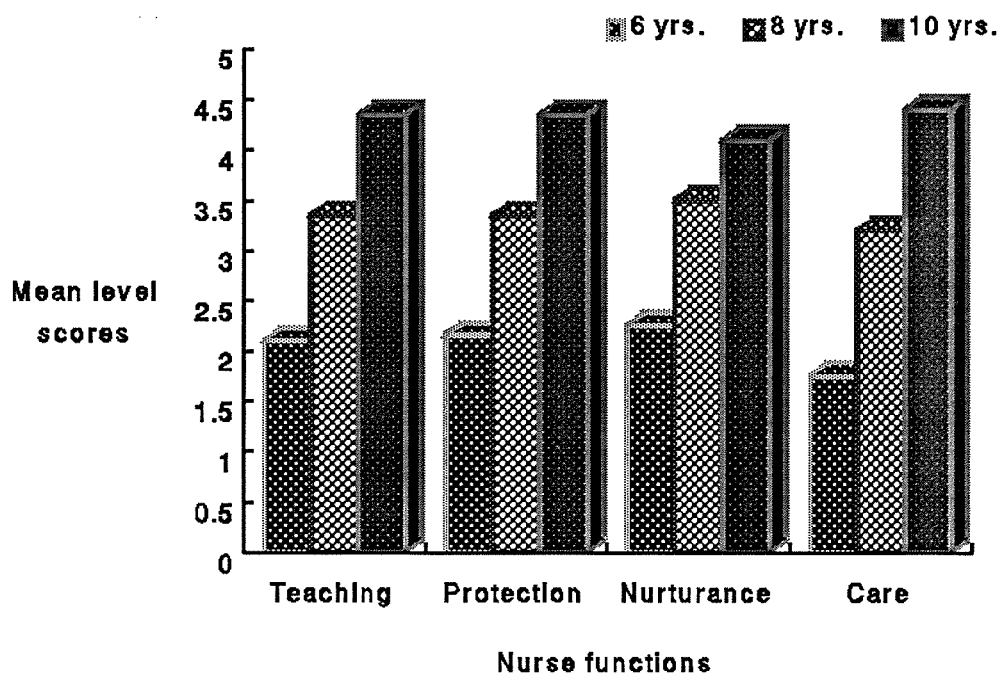
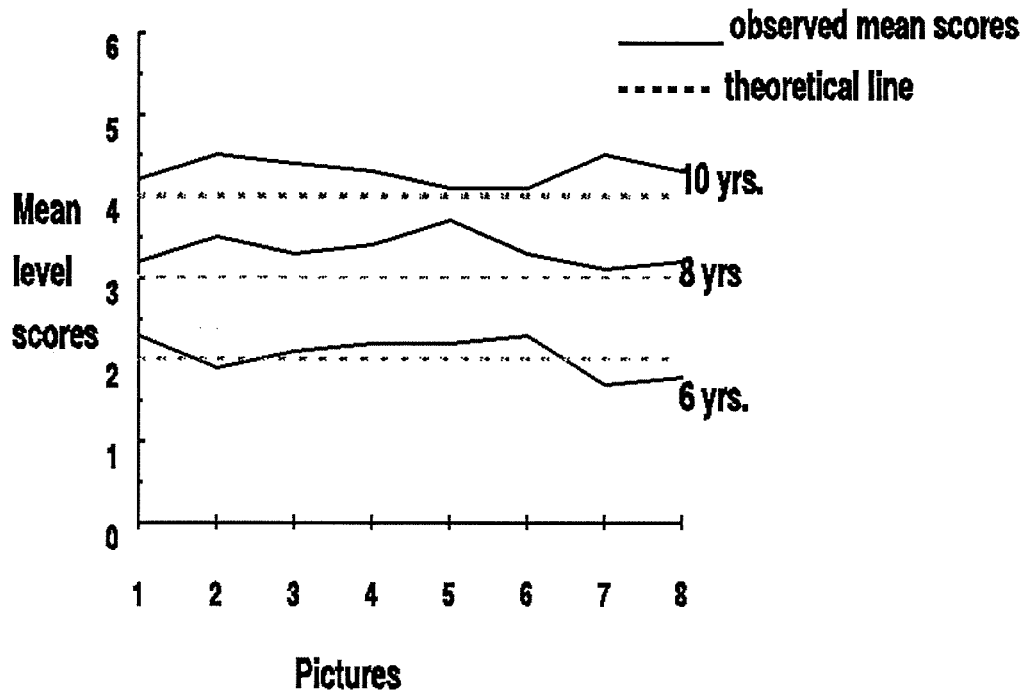


Figure 3. Mean level scores for all age groups on each nurse function

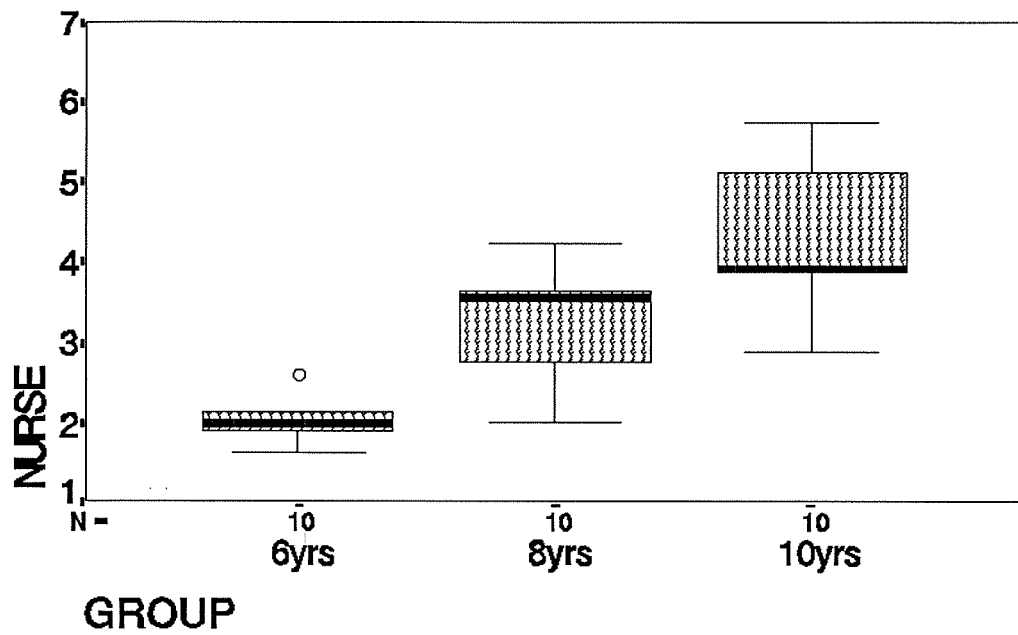
design with subjects nested within levels of age and levels of nurse functions nested within levels of pictures was also conducted, the results of which are presented in Table 11.

Significant main effects were found for age and not for nurse function or pictures nested within levels of nurse function. Furthermore, no significant interaction effects were found. Therefore, the hypothesis that the means of the 6-, 8-, and 10-year-olds would differ was supported.



Note. Pictures 1 to 8 represent the situations hospital gown, hungry and thirsty, bathroom, I.V. bottles, teddy bear, hug, yucky and gucky, and blanket, respectively.

Figure 4. Mean levels by age for each picture.



Note. For further information on how to interpret this figure, please refer to Appendix N.

Figure 5. Box and whisker plot showing the range of performance of each age group on the Nurse's Role Task.

Table 11  
Analysis of Variance of a Mixed Design  
for the Nurse's Role Task

Source	<u>df</u>	<u>F</u>
Between subjects		
Age (A)	2	26.18**
A x B <sup>a</sup>	6	1.14
A x C <sup>b</sup> (B)	8	0.95
S <sup>c</sup> within-group error	27	(3.85)
Within subjects		
B	3	0.74
C(B)	4	0.18
S x B(A) within-group error	81	(0.53)
S x C(AB) within group error	108	(0.36)

Note. Values enclosed in parentheses illustrate mean square error. <sup>a</sup>B = Nurse functions, <sup>b</sup>C = Pictures, <sup>c</sup>S = Participants. C(B) = Levels of nurse function nested within levels of pictures. n = 10 for each age group.

\*\*p < .01.

These results indicated that a) performance of all nurse function situations changed with age; b) each age group responded similarly to nurse functions situations; and that c) there was no significant difference between story situations (pictures) within nurse functions.

In order to check if an increase in the number of hospitalizations had any effect on the child's level of understanding on the Nurse's Role Task, the number of hospitalizations together with the child's mean level score were tabulated (see Table 12). Through visual inspection of the data, it appeared that there was no obvious relationship between the number of hospitalizations and the child's level of understanding on the Nurse's Role Task.

Furthermore, an item analysis was performed for the 8 pictures of the Nurse's Role Task to estimate the internal consistency of the obtained scores. A reliability coefficient alpha of .96 was obtained.

Overall, a modest acceleration in cognitive development in the social domain was found, being of the order of one-third substage at the 8- and 10-year-old level of understanding by hospitalized children with chronic conditions. However, 6-year-old hospitalized children did not show any notable acceleration in their social development as measured by the Nurse's Role Task.

Table 12

Number of Hospitalizations of Each Subject with His/Her Mean  
Level Score on the Nurse's Role Task for Each Age Group

<u>Subject</u>	<u>6 yrs.</u>		<u>8 yrs.</u>		<u>10 yrs.</u>	
	<u>#</u>	<u>M</u>	<u>#</u>	<u>M</u>	<u>#</u>	<u>M</u>
A	2	1.63	2	3.25	2	3.88
B	2	1.63	3	3.63	3	3.88
C	3	2.63	6	3.63	3	5.75
D	4	2.63	6	3.50	3	5.75
E	5	2.00	6	2.75	3	4.00
F	5	2.00	7	4.00	4	3.88
G	5	2.13	8	3.63	4	4.00
H	6	2.13	10+	4.25	10+	5.13
I	10	2.00	10+	2.75	20+	3.88
J	10+	1.88	20+	2.00	20+	2.88

Note. # refers to the number of hospitalizations. n = 10  
for each age group.

The percentage of 6-, 8-, and 10-year-olds responding at, above, or below the prototypic level for their age (i.e., level 2, 3, and 4, respectively) is presented in Table 13.



Table 13

Percent of 6-, 8-, and 10-year-olds Responding at Proposed Prototype, Above Prototype, and Below Prototype (i.e., 1, 2, and 3 substages) for Each Nurse Function

		<u>Nurse Function</u>	<u>% Prototypic</u>	<u>% Above</u>			<u>% Below</u>		
				<u>1</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>3</u>
<u>Age</u> <u>6</u>	Protection	75	5	10			10		
	Care	65	5				30		
	Nurturance	55	20	10			15		
	Teaching	75	10	5			10		
<u>Age</u> <u>8</u>	Protection	55	15	10	5		15		
	Care	30	35	5			30		
	Nurturance	45	15	15	5		20		
	Teaching	50	35	5			10		
<u>Age</u> <u>10</u>	Protection	50	20	15			15		
	Care	45	25	15			15		
	Nurturance	45	5	20			25	5	
	Teaching	50	15	20			10	5	

Note. n = 10 for each age group.

Question B: Do the mean level scores of Case's stages of cognitive development correspond with the mean scores of children with chronic conditions on a causal reasoning task?

Means (with standard deviations in parentheses) for the 6-, 8-, 10-year-olds on the balance beam task were 2.25 (.35), 2.83 (.35), and 3.85 (.85), respectively. As delineated in the description of the method used, level-scores on the balance beam task were submitted to a one-way analysis of variance (ANOVA), the results of which are presented in Table 14.

Table 14

One-Way Analysis of Variance for Obtained Levels on the Balance Beam Task by Age Group

---

<u>Source</u>	<u>df</u>	<u>MS</u>	<u>F</u>
Between groups	2	6.55	19.67**
Within groups (error)	26	0.33	

---

\*\*p < .001

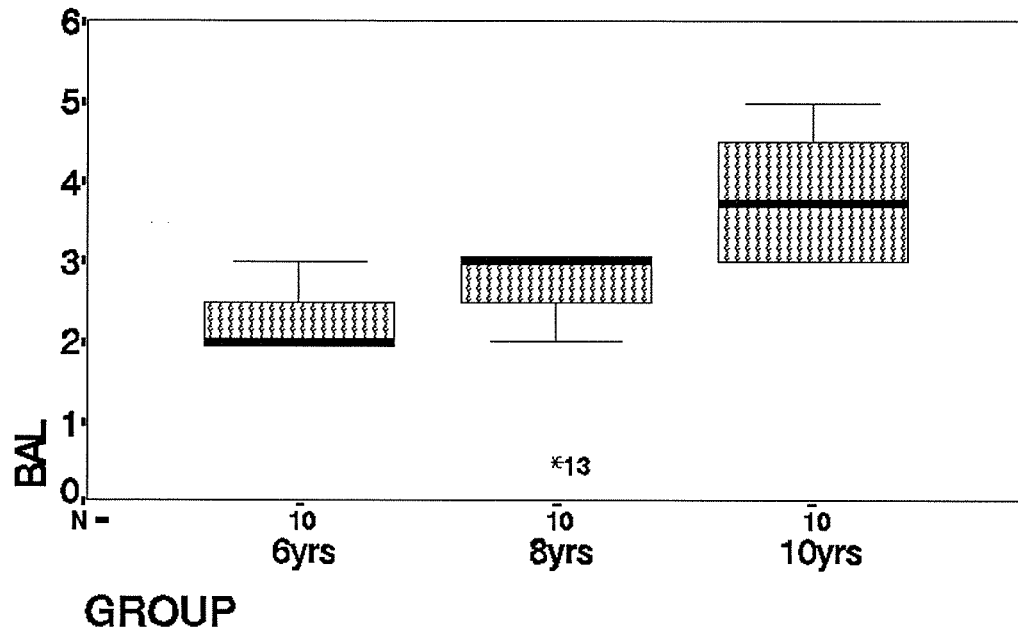
Note. Including all subjects, the effect of age was also statistically significant,  $F(2,27) = 14.10$ ,  $p = .0001$ .

Subjects were divided into three age groups, 6-, 8- and 10-year-olds respectively ( $n$  in each group = 10). It was decided to omit one 8-year-old subject in group 2 (see Figure 6). This subject didn't achieve optimally at the time the task was given for medical reasons; his performance resulted in an extremely low score. The examiner was of the opinion that the subject's obtained level score on the balance beam was not a valid representation of his level of causal reasoning.

The results of the one-way analysis indicated significant differences at the .05 level between the three age groups. Therefore, the hypothesis stated in Chapter 3, that the means of the three age groups would coincide, was rejected. The power of this analysis was 1.00.

Subsequently, Newman-Keuls' test was conducted to make post hoc comparisons between the means of the three age groups. As hypothesized, there were significant differences between all three age groups. These results support Case's theory of cognitive development (1992).

A test of linearity showed a linear trend ,  $F(2, 26) = 38.47$ ,  $p = .0001$  (see Figure 7). No significant deviation from the linear trend was apparent,  $F((2, 26) = 0.88$ ,  $p = .36$ .



Note. Participant 13 was omitted from the analysis for medical reasons (extreme low score). For further information on how to interpret this figure, please refer to Appendix N.

Figure 6. Box and whisker plot showing the performance of all subjects within each age group on the Balance Beam Task.

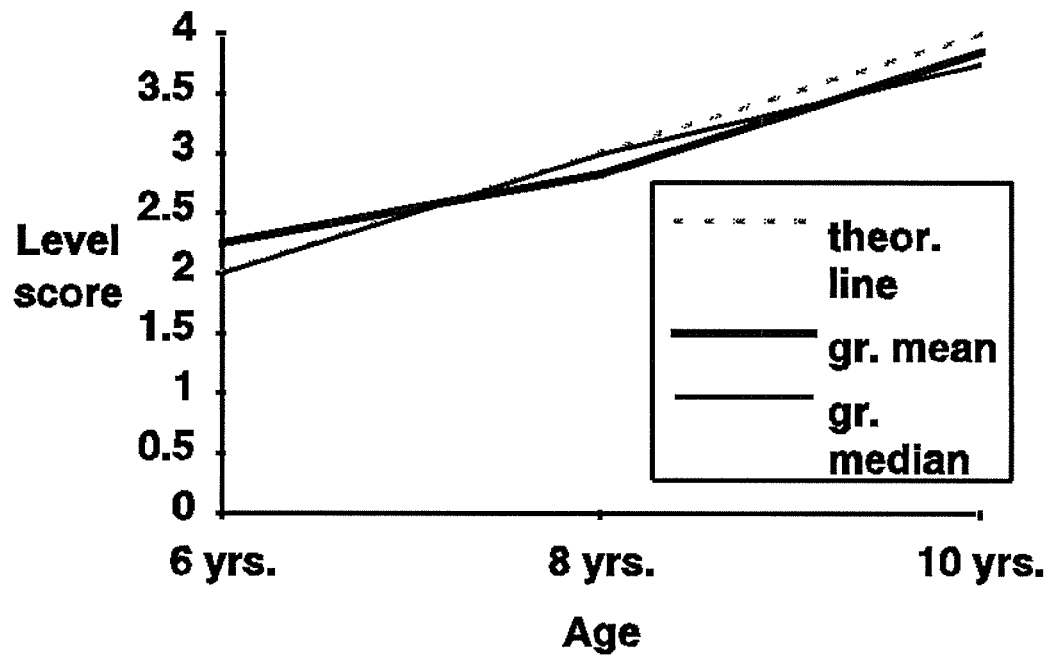


Figure 7. Mean level scores for each age group on the Balance Beam Task.

The percentages of 6-, 8-, and 10-year-olds responding at, above, or below the prototypic level for their age (i.e., level 2, 3, and 4, respectively) are presented in Table 15.

Table 15

Percent of 6-, 8-, and 10-year-olds, Responding at Proposed Prototype, Above Prototype (0.5 and 1 Substage), and Below Prototype (0.5 and 1 Substage) on the Balance Beam Task

<u>Age</u>	<u>% Prototypic</u>	<u>% Above</u>		<u>% Below</u>	
		<u>0.5</u>	<u>1</u>	<u>0.5</u>	<u>1</u>
<u>6 YRS</u>	60	30	10		
<u>8 YRS</u>	77	11		11	11
<u>10YRS</u>	10	20	20	10	40

Note. n = 10 for group 1 and 3 (6- and 10-year-olds, respectively) and n = 9 for group 2 (i.e., one 8-year-old subject was omitted from analysis)

Question C. Are the mean scores of children with chronic conditions on their perception of the hospital nurse's roles advanced as compared to their mean scores on causal reasoning?

To address this question, three t-tests for paired samples were performed to compare the overall mean scores of each age group on the Nurse's Role Task with those on the Balance Beam Task. For this test the outlier in group 2 (i.e., 8-yr-old subject) was also omitted. Results are presented in Table 16.

The t-tests indicated no significant differences

Table 16

T-values for Comparisons Between the Nurse's Role Task and the Balance Beam Task Including Mean Scores for Each Age Group

---

Group: 1 (6 yrs.)

<u>Variable</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>df</u>	<u>1-tail</u> <u>Sig</u>
Balance Beam	2.25	.35	1.26	9	.12
Nurse's Role	2.06	.35			

---

Group: 2 (8 yrs.)

<u>Variable</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>df</u>	<u>1-tail</u> <u>Sig</u>
Balance Beam	2.83	.35	-6.06	8	.00*
Nurse's Role	3.49	.51			

---

Group: 3 (10 yrs.)

<u>Variable</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>df</u>	<u>1-tail</u> <u>Sig</u>
Balance Beam	3.85	.85	-1.41	9	.10
Nurse's Role	4.30	.93			

---

\*p < .001

Note. n = 10 for each age group, except for group 2, n = 9 (i.e., one participant was omitted for medical reasons).

between mean scores on the Balance Beam Task and the Nurse's Role Task for groups 1 and 3, 6-year-olds and 10-year-olds, respectively. However, significant differences were observed for group 2. In other words, the 8-year-old children's understanding of the hospital nurse's role was significantly higher than their understanding of causal reasoning. The power of the three  $t$ -tests was 0.12, 0.92, and 0.26 for respectively groups 1, 2, and 3.

Consequently, the hypothesis that subjects' mean level scores on the Balance Beam and the Nurse's Role Task would coincide was accepted for groups 1 and 3 and rejected for group 2.

Furthermore, the mean scores for each age group on both the Nurse's Role Task and the Balance Beam Task compare to the theoretical prediction (Case, 1992) as follows: Six-year-olds were approximately one-fifth of a substage advanced in their level of understanding on causal reasoning compared to their level of understanding on the Nurse's Role Task. However, both 8- and 10-year-olds showed a moderate acceleration in their level of understanding on the Nurse's Role Task as compared to their comprehension on the Balance Beam Task, being of the order of approximately three-fifths and half of a substage, respectively. To illustrate the differences in findings between the Nurse's Role Task and the Balance Beam, mean levels are graphed by Age (see Figure 8).



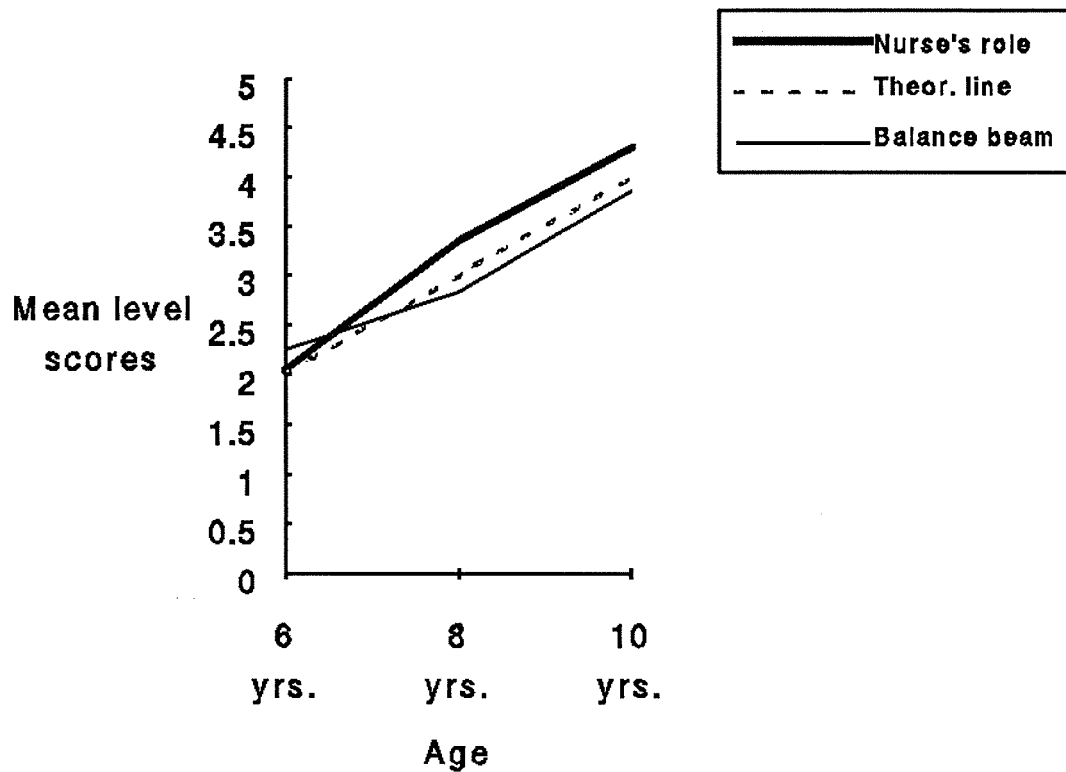


Figure 8. Mean scores at different age groups, for both the Nurse's Role Task and the Balance Beam Task.

Question D: Do the mean level scores of Case's stages of cognitive development coincide with the mean scores of children with chronic conditions on their intrapersonal understanding (i.e., happy, sad, good, and bad)?

Mean scores (standard deviations) for each concept and the means (standard deviations) for the overall scores on the four tasks are described in Table 17.

Table 17

Mean Scores and Standard Deviations of Level Scores for each Age Group and by each Concept (happy, sad, good, and bad)

Task of Intrapersonal Understanding

	<u>HAPPY</u>		<u>SAD</u>		<u>GOOD</u>		<u>BAD</u>		<u>GROUP MEAN</u>	
<u>Age</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
<u>6YR</u>	2.60	1.07	2.40	0.70	2.10	1.20	2.40	0.97	2.38	0.57
<u>8YR</u>	2.70	0.67	3.10	0.74	2.80	1.03	3.20	0.63	2.95	0.48
<u>10YR</u>	2.90	0.99	3.70	1.06	3.90	1.20	4.10	1.10	3.65	0.91

Note. n = 10 for each age group.

To illustrate the findings, mean levels for each concept were graphed by age groups for each concept (Figure 9).

Initially, a one-way analysis was performed on the three group means of all four concepts. Results indicated that there was a significant effect for age,  $F(2, 27) = 8.87$ ,  $p = .001$ . The power of this analysis was 0.96. Subsequently, Newman-Keuls' test was conducted for making post hoc comparison between the means of the three age groups. There were significant differences between groups 1 and 3, respectively 6- and 10-year-olds, and between groups 2 and 3, respectively 8- and 10-year-olds, but not for groups 1 and 2, respectively 6- and 8-year-olds. A test of linearity showed a linear trend in the data,  $F(2, 27) =$



Figure 9. Mean level scores of each age group for each concept.

17.69,  $p = .0003$ . No significant deviation from the linear trend was apparent,  $F(2, 27) = 0.06$ ,  $p = .81$ .

After inspection of the data and out of conceptual interest, it was decided to conduct a multivariate analysis of variance (MANOVA) with the four different concepts as dependent variables. Using MANOVA, a significant age group effect was found. The value of Wilks' Lambda was 0.53. The approximate  $F$  value with 8, 48 degrees of freedom associated with this Wilks' Lambda is 2.24,  $p = .04$ . Wilks' Lambda was

the criterion of choice because of its power (Tabachnick & Fidell, 1989). Follow-up univariate  $F$ -tests showed a significant group effect for the concepts sad, good, and bad. However, no significant group effect was found for the concept "happy." Results of the univariate analysis are presented in Table 18.

Furthermore, an item analysis was performed for the 4 concepts of the Task of Intrapersonal Understanding to estimate the internal consistency of the obtained scores. A reliability coefficient alpha of .76 was found.

The percentage of 6-, 8-, and 10-year-olds responding as per, above, or below the prototypic level for their age (i.e., level 2, 3, and 4, respectively) is depicted in Table 19.

Table 18

Univariate Analysis of Variance of Each Concept (happy, sad, good, and bad) by Age Group (6-, 8-, 10- years)

<u>Source</u>	<u>MS</u>	<u>F</u>	<u>P</u>
Happy	0.23	0.27	.766
Sad	4.23	5.89	.008*
Good	8.23	8.28	.006*
Bad	7.23	8.53	.001*

df (2, 27), \* $p < .01$ .

Note.  $n = 10$  for each age group.

Table 19

Percent of 6-, 8-, and 10-year-olds by Concept, Responding at Proposed Prototype, Above Prototype, and Below Prototype (i.e., 1, and 2 substages)

		<u>Concept</u>	<u>% Prototypic</u>	<u>% Above</u>		<u>% Below</u>	
				<u>1</u>	<u>2</u>	<u>1</u>	<u>2</u>
<u>Age</u> <u>6</u>		Happy	50	10	30	10	
		Sad	40	50		10	
		Good	30	10	20	40	
		Bad	60	10	20	10	
<u>Age</u> <u>8</u>		Happy	50	10		40	
		Sad	50	30		20	
		Good	30	30		30	20
		Bad	60	30		10	
<u>Age</u> <u>10</u>		Happy	40			10	50
		Sad	50		10	30	10
		Good	30	20	10	30	10
		Bad	20	30	10	40	

Note. n = 10 for each age group.

An analysis of age-level responses to the "source" questions for each concept indicated that an internal source was given by a majority of 10-year-olds and 8-year-olds in the sample for each of the four concepts examined (ranging from 60% to 70%, and 40% to 80%, respectively), and by a minority of 6-year-olds (10% to 30%). The remaining 6-year-olds provided either an "unknown" source (20%) or an external source (58%).

Question E: Does advanced understanding of the hospital nurse's role correspond to advanced understanding on another task which is social in nature? In other words, do the mean scores of children with chronic conditions on their perception of the hospital nurse's roles coincide with the mean scores of their intrapersonal understanding?

To answer this question a t-test for paired samples was performed to compare the overall mean scores of each age group for both the Nurse's Role Task and the Task of Intrapersonal Understanding to examine if there were significant differences in the child's level of understanding.

Results of the t-tests are presented in Table 20. The t-tests indicated significant differences between the means across tasks on the Nurse's Role Task and the Task of Intrapersonal Understanding for groups 1 and 3, 6-year-olds and 10-year-olds respectively. In other words, 6-year-old and 10-year-old subjects scored significantly lower and

Table 20

T-values for Comparisons Between the Nurse's Role Task and the Task of Intrapersonal Understanding Including Mean Scores for Each Age Group

---

Group: 1 (6 yrs.)

<u>Variable</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>df</u>	<u>2-tail</u> <u>Sig</u>
Concept Task	2.38	.57	2.37	9	.04*
Nurse's Role	2.06	.35			

---

Group: 2 (8 yrs.)

<u>Variable</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>df</u>	<u>2-tail</u> <u>Sig</u>
Concept Task	2.95	.48	-1.75	9	.11
Nurse's Role	3.34	.67			

---

Group: 3 (10 yrs.)

<u>Variable</u>	<u>M</u>	<u>SD</u>	<u>t</u>	<u>df</u>	<u>2-tail</u> <u>Sig</u>
Concept Task	3.65	.91	-3.11	9	.01*
Nurse's Role	4.30	.93			

---

\*p < .05

Note. n = 10 for each age group.

higher, respectively, on the Nurse's Role Task than on the Task of Intrapersonal Understanding. However, no significant difference between the subjects' understanding

of the Nurse's Role Task and the Task of Intrapersonal Understanding was found for group 2 (8-year-olds). The power of the three  $t$ -tests was 0.30, 0.29, and 0.32 for groups 1, 2, and 3, respectively.

To illustrate the differences in findings between the Nurse's Role Task and the Task of Intrapersonal Understanding, mean levels were graphed by age (see Figure 10).

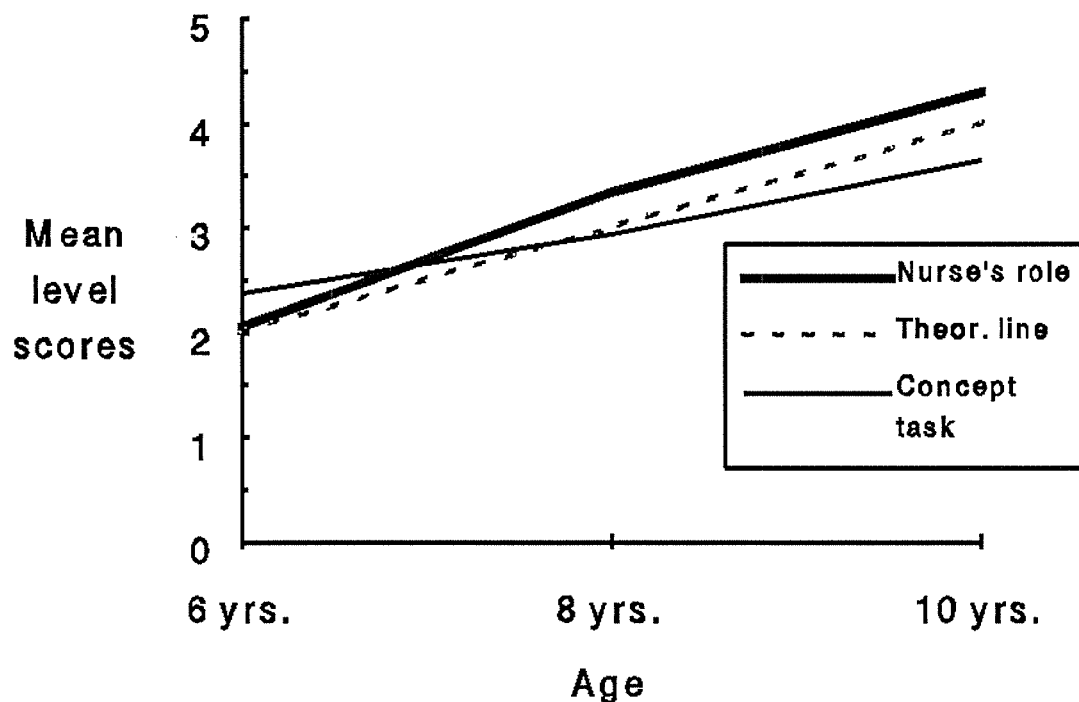


Figure 10. Mean level scores of the three age groups for both the Nurse's Role Task and the Concept task.

The observed mean scores of each age group on both the Nurse's Role Task and the Task of Intrapersonal



Understanding compare to Case's (1992) theoretical predictions in the following way: Six-year-old hospitalized children with chronic conditions were one-third of a substage advanced in their understanding of the four concepts in relation to their understanding of the hospital nurse's role. However, both the 8- and 10-year-olds showed an acceleration in their understanding of the nurse's role compared to their comprehension of the four concepts, being of the order of approximately two-fifths and two-thirds of a substage, respectively.

Implications of the results of the five analyses are discussed in further detail in the next chapter.

#### Contextual description of the data

In order to provide some background and/or contextual information about the circumstances under which the data were collected, an overview of the characteristics of each age group is given. Subsequently, specific characteristics of four hospitalized children with chronic conditions, a 4-year-old, a 6-year-old, an 8-year-old, and a 10-year-old, respectively, are discussed in further detail. These children were chosen because of their advanced understanding of the hospital nurse's role. To elaborate on the findings for these four children, their explanations of the four concepts (i.e., happy, sad, good, and bad) together with their level of understanding on the Balance Beam Task are also given. The situations and experiences that may have

affected their perceptions are described as far as they were known by the examiner. Typical level characteristics were put in italics and/or were further explained between brackets. Their actual names have been changed to protect their privacy.

Age four:

Overall, it was difficult to interview 4-year-old hospitalized children. They are too young to concentrate for the time necessary to complete the tasks. Furthermore, the distracting hospital environment, where children's time is occupied or frequently interrupted for most of the day, was not optimal for collecting the data. Reflecting a modern trend that keeps the length of children's hospitalizations at a minimum, time was often too short to complete all three tasks. Therefore, it was decided half-way through the data collection to discontinue interviewing this age group. All 4-year-olds who were interviewed had no understanding of the reason why they needed to be hospitalized. They either responded with "I don't know" or "just because....." Despite the fact that all 4-year-olds strongly disliked medical procedures such as "pokes" (needle insertion) and going for tests, they liked being in the hospital because they could play with other children in the play room. For example, one little 4-year-old boy who suffered from nephrotic syndrome said the following about "getting a shot":

It will hurt. (R. Why does it hurt?) Because it is a shot. (R. How does that make you feel to get a shot?) I feel upset. (R. Why do you feel upset?) Because...because....because....because...(whispers softly).

On the other hand, one 4-year-old with a multiple chronic condition (i.e., cystic fibrosis and asthma) who according to his mother "loved being in the hospital" said the following to the question "What does it mean to be happy?":

I feel happy right now because I get to play in the playroom...My body just wants to be happy now...Uhum...My body just wants to be like that. (R. Why is your body happy right now?) Uhum....I don't know that. (R. And where does your happiness come from?) From my body.

This little boy's mother tried to make his hospitalization as pleasant as possible by talking and playing with her son as much as she could. He didn't finish all three tasks because he preferred playing instead of participating in this study till the end.

One of the four 4-year-olds who completed all three tasks showed an advancement of approximately two-thirds of a substage in her understanding of the hospital nurse's role. To illustrate, the interview with this 4-year-old girl will be presented in further detail.

Denise, a 4-and-a-half year old girl with cystic fibrosis, was hospitalized for her fourth time. Over a two week period, Denise received medication through an intravenous drip. She was cooperative with her medical treatments, although the insertion of her I.V. needles (this

had to be done twice over a period of two weeks) caused her a lot of distress. She was a talkative and affectionate little girl who loved the Lion King. She watched the movie the "Lion King" over and over again.

Denise came from a single-parent family. Both her mother and grandmother visited her on a regular basis. Even though they did not stay with her in the hospital overnight, one of them was always there when some medical procedure needed to be done with her. Both her mother and grandmother spent a long time explaining to Denise what her treatments were for and why certain procedures needed to be done. Consequently, her knowledge of certain medical treatments was remarkable for her age. For example, one of her roommates had to receive medication through a gastric tube. Her response to him wearing a tube in his nose was as follows: "He got a tube in his nose....It goes all the way down to his stomach. The tube is checking what his stomach is doing." Even though the purpose of this gastric tube was not to check what the roommate's stomach was doing but to provide the little boy with more adequate nutrition, she understood that the tube went into the nose all the way down to the boy's stomach. It also shows that her understanding went beyond the boundaries of perception alone because the going down of the tube into the stomach is not directly observable. Furthermore, Denise understood that you get medicine through an intravenous (I.V).

It was not difficult to interview Denise because she loved the attention it provided. Even though she thought the Nurse's Role Task was kind of tedious after a while, she cooperated till the end. Denise's level of performance on the Nurse's Role Task was advanced. Her level of understanding on six out of the eight stories was at the 6-year-old level. Even though her explanations of the hospital nurse's intentions were still basic, she understood that nurses have reasons for their actions and that these reasons are to improve the little girl's well-being. For example, her response to the "bathroom" situation was:

She (nurse) will take her to her room and lay her down.  
(R. Why?) Because.....*so the pain will go away* (nurse's plan to improve the little girl's immediate future).  
(R. How will that make the nurse feel?) Sad. (R. Why?)  
Because she doesn't want the kid to be having a belly ache (immediate intention of the nurse).

Denise also showed some advancement, although minimal, in both her understanding of the four concepts happy, sad, good, and bad (mean level 1.25) and causal reasoning as tested by the balance beam task (level 1.5). For example, her explanation of the word "bad" was as follows:

Throwing stuff around (Behavior) and you get angry (Judgement) and you are mad (Feeling). (R. What is happening when you are bad?) Then you break....break...break glass (B). (R. And when you break glass, where do you think your badness comes from?). Your heart (internal source).

Denise's advanced understanding on all three tasks could be explained by the fact that both her mother and grandmother discussed Denise's hospitalization openly with

her and gave the special attention needed for her to cope with the hospitalization stress. This encouraged Denise to ask questions about her treatments and receive adequate answers.

Age six:

The 6-year-old hospitalized child with a chronic condition is similar to a 4-year-old child in the sense that he/she needs a familiar person, in most cases the parents, to be with him/her during the hospital stay. Most parents of the children who participated in this study stayed with their children in the hospital overnight or spent the night in a hotel nearby. If one of the parents was not close by, the child could phone his/her parent at any time of the day to be comforted or the parents phoned at least once a day themselves. Most medical procedures were stressful for the 6-year-old child. The children either did not know the reason for their hospitalizations or gave simple answers referring to external symptoms. For example, a 6-year-old boy with Crohn's disease explained the reason for his hospitalization as follows:

For uhum.....for my bum. (R. Does it hurt?) Yes.

Or the response of a 6-year-old boy suffering from seizures was:

Something wrong with me. (R. Do you know what happened? What was wrong?) I don't know yet.

Just like the 4-year-olds, all 6-year-olds who were interviewed strongly disliked receiving "pokes" (i.e.,

needle insertion) and were quite upset getting them. Most children were amazingly well acquainted with certain hospital equipment. For example, one girl with a multiple chronic condition (i.e., cystic fibrosis and seizures) repeatedly wanted to play with the nursing equipment brought in by the researcher. She used all the play equipment (i.e., a stethoscope, injection needle, blood pressure cuff, I.V. machinery) appropriately. Children understood the use and operation of an intercom (e.g., see Table 5, p. 97). Children with cystic fibrosis, in particular, understood the procedures involved with operating the intravenous drip, a way of receiving treatment frequently used with this condition. For example, one girl with a multiple chronic condition (i.e., cystic fibrosis and seizures), whose I.V. machine alarmed/"beeped" constantly because of her abrupt movements, operated her own I.V. machine by pressing the buttons and unplugging the electrical cable whenever she wanted to go for a walk.

All children understood that hospital nurses have intentions for their behaviour. However, the explanations of these intentions were still very basic and often referred to improving the immediate future of the little boy/girl. Most children responded at the prototypical age-level on the Nurse's Role Task, although a few children were able to describe more than one intention for the nurse's action, a characteristic of the 8-year-old level of understanding.

For example, the response of a 6-year-old girl with ectodermal dysplasia (i.e., failure to thrive) to the scenario "bathroom" was:

The nurse will help her. Give her some medicine. So the pain will go away (*immediate plan to improve the little girl's well-being*). (R. Why else?) Because she wants to make the girl feel better (*nurse's intention*). (R. How will that make the nurse feel?) She will feel happy because she helped the girl. (R. What does the nurse think then?) She thinks about that she always has to help kids (*knowledge of role of the nurse*) because they are sick.

A typical 6-year-old explanation of the nurse's intention for her/his behaviour was that she/he acts a certain way because she/he has to help the little girl/boy. The majority of children were able to describe the nurse's thoughts, something that was difficult for their 4-year-old peers. Most 6-year-olds did not understand the reason why children need to wear a hospital gown before an operation; neither did they comprehend the reason behind not being allowed to eat or drink before a test. One 6-year-old with a congenital heart defect, however, said the following to the scenario "hospital gown":

She (nurse) will put it on. (R. Why?) Because she wants him to. (How will that make the nurse feel?) Sad. (R. Why?) Because she wants him to put it on. (R. What will the nurse think then?) She thinks, *she doesn't want the blood to go on his shirt*. (R. Why?) Because then his mom will be mad.

Whereas most children either did not show any advancement in their understanding or demonstrated a minor advancement, it is worth mentioning the interview with one 6-year-old boy suffering from Crohn's disease. Robert had



been hospitalized many times (i.e., his mom lost count). He was an intelligent and compassionate little boy. His touching and thoughtful reaction to the pain of one of his roommates was:

Poor guy...he is on pills and feels bad. It's not funny (Robert wanted to get out of his bed to comfort the little guy). I think he is crying about his mom.

Robert's mother was present during his entire hospital stay. She stayed in the hall-way during the interview and he needed to be confirmed of her presence several times. Robert did all three tasks in one session. He wanted to complete them all because he was looking forward to getting a present at the end. He took the questions very seriously. His understanding of the role of the hospital nurse was slightly advanced (his mean level score was 2.25). Robert often projected his own situation to that of the little boy in the pictures without directly referring to it. For example, in the scenario "hospital gown" he said:

She will say: "Sorry, but you have to wear it or else...if you don't wear it then you might get into trouble." (R. Why is that?) Because if he is not wearing it and he has to or else..she gets mad at you.. the nurse might get mad at you. (R. Why would the nurse get mad?) Because you have to wear it. If you don't then you can't get the surgery done. Maybe that guy's butt is sore (*projection to his own situation*). (R. How will that make the nurse feel?) Sad because the kid doesn't want to and she is mad at him but she doesn't want (*B1: first intention of the nurse*) to feel sad. (R. Why not?) Because she wants him to get better (*B2: second intention of the nurse*).

Robert's level of performance on the Task of Intrapersonal Understanding was advanced for his age (his

mean level score was 2.5). Overall, his responses were at the 8-year-old level of understanding. For example, his explanation of the concept "happy" was:

It means you be happy about trees and forest. Trees, farms, and chickens and all the animals and grass. It means to..it means to hope you get better and do stuff you like (B + J + J). And you be thankful for the stuff you get and you have to like it, you can't hate it (B + J + J). And you are really proud of yourself (F). (R. And when you get stuff and you are proud of yourself, where do you think your happiness comes from?) Uhum....from God (*external source*).

Furthermore, Robert's level of performance on the Balance Beam Task was age appropriate.

Age eight:

The reaction of an 8-year-old child with a chronic condition to hospitalization is similar to that of the 10-year-old child in the sense that they are familiar with the hospital routines and more acquainted with medical procedures. Most children were beginning to understand the reason behind wearing a hospital gown when you go for an operation but still gave a basic explanation for rationale behind not being allowed to eat or drink before a test. For example, one girl with pancreatitis said the following about the nurse's action and rationale in the scenario "hospital gown:

The nurse will say: "No, you have to wear the nurse gown." (R. Why does she say that?) Because it is clean. Her pyjamas may have not been washed. Because they don't want you to have any germs in the place that you have an operation. The gown also opens at the back which makes it easier for them to take it off. Her own pyjamas may not open at the back.

Another boy with asthma gave the following basic explanation to the action and rationale of the nurse in the scenario

"Hungry and Thirsty":

She says:"NO." (R. Why does she say "no"?)  
Because..uhum..he is not allowed to because the test.  
Because if he doesn't listen to the rules, he might be sick and he would have to stay in the hospital longer.

In some cases the child not only explained the hospital procedure accurately but also referred to a fantasy the little girl/boy in the story might have. For example, a girl suffering from chronic pyelonephritis not only explained the purpose of an I.V. correctly but she also mentioned a fantasy the little girl in the scenario "I.V. bottles" might have about the beeping of the machine when the medication runs out. Her response to the little girl's initial feeling was:

She feels really scared because it started to beep. (R. Now why would that make her scared?) She thinks all the blood work will be sucked out because....like a vampire is drinking her blood. But it is only an empty bottle or the medicine stopped going in.

Most children showed curiosity instead of anxiety towards medical equipment (e.g., an I.V. device). The majority of children began to understand the reason for their hospitalization. For example, the answer of an 8-year-old boy with asthma to the question why he was in the hospital, was as follows:

I am in the hospital because I have asthma very bad. I got it when I was turning one, I think, and I have had it pretty bad and it hits me through a pretty bad spot. About three or four years ago I had to go in five times in six months. Last year I came in

September for three weeks because of my asthma and when I came back my dad had put a vent, an air purifier and tile floors down in my room so...I feel much better now in my room.

A couple of children with chronic conditions showed a remarkable advancement in their understanding of the hospital nurse's role. They not only were able to give more than one intention for the action of the nurse but also could sometimes interpret and compare the little boy/girl's situation to their own. They started to express empathy for the role of the hospital nurse. One 8-year-old boy with asthma mentioned the fact that the nurse might feel sad about the little boy losing his teddy bear in the hospital because "it makes her think about her own young years when she (nurse) lost her teddy bear in the hospital too." Furthermore, this boy referred to the feelings of the nurse as if she/he was caring for the little boy as she/he would care for her/his own son. This reflects the possessive relationship the nurse might have with her/his patient. However, these characteristics are presumed to appear at the age of twelve/thirteen (Goldberg-Reitman, 1984).

In contrast, though one boy with cystic fibrosis understood that nurses act in a particular fashion because they care for the child and was able to give answers at the prototypical age level, this boy also interpreted certain actions of the nurse (e.g., her/him not giving a drink or food before a surgery) as her/him being mean to the little boy. This boy was also extremely upset with the nurses when

he needed a nose tube for a couple of days.

Anna, an 8-year-old girl with multiple chronic conditions (i.e., cystic fibrosis, food allergies, and a congenital heart condition), showed significant advancement in her understanding of the hospital nurse's role. Her mean level score on the Nurse's Role Task was 4.25 (the prototypical level for her age is 3). She had been hospitalized more than 10 times in her life, approximately twice a year. Therefore, she was familiar with her room in the ward and felt at ease with all the hospital personnel. Anna was a very talkative and approachable little girl. She was curious to know more about her food allergies from the dietitian and wanted to know what exactly she was allowed to eat. It was obvious from Anna's behaviour that she was well acquainted with the hospital environment. Her mother visited her on a regular basis and treated Anna like a mature little girl.

Her behaviour during the interview was "high-strung" and she had a hard time sitting still. Even though it was difficult for her to concentrate till the end, her answers were evidently above her age level. She showed multiple signs of metacognitive thinking, an aspect characteristic of the vectorial stage. For example, in the scenario "I.V. Bottles" she mentioned the following:

*She (nurse) thinks that the girl might be thinking (metacognitive thinking) that...well she might have to get a new needle... a new needle (often children that are on an I.V. for more than a week, need a new needle*

inserted) or something. She might get it in her hand or her arm because my hands are free (refers to her own situation) because the girl is really really crying loud and she is panicking.

Furthermore, Anna could interpret the nurse's feelings by referring not only to her own life but also to that of her parents, a characteristic that is assumed to appear at the 14-year-old level. For example, in the scenario "teddy bear" she described the nurse's feelings the following way:

It makes the nurse feel sad to see the little girl cry because she might not want to see her cry. My dad felt that when I had to go for my operation. Yeh, my mum started crying because of the breathing machine. It stopped working for a couple of seconds and she was crying a little bit because it was breathing for me.

Consequently, she was aware of the fact that other people do not like to see a little child suffer and she was able to generalize a feeling among more than one person (e.g., sadness). She also understood how the little girl in the story might feel because she had felt similarly in the past. For example, in the teddy bear scenario she stated, "The little girl really wants her teddy bear because she might be scared because she has to go for an operation and she might be scared that it might hurt. I was scared when I had my operation. I started screaming. Every one heard me in the whole ward."

Moreover, Anna's performance on the Task of Intrapersonal Understanding was advanced as well. The majority of her responses were at the 10-year-old level. To illustrate Anna's advanced understanding on the Concept

Task, the following response on the concept bad is given:

Bad means when I yell at my mum (B), I don't want my mom that much (J) because she yells at me too. And I fight when I am not good (B + F)). And I don't like anybody (J) and I am mean (F). (R. What is happening when you are bad?) I get really bad and like I feel like breaking everything in my room (B + F). (R. And when you feel really bad and you want to break everything where do you think your badness comes from?). From....I don't know.

Even though Anna's explanations of the four concepts did not show any signs of abstract or metacognitive thinking as her answers on the Nurse's Role Task did, her responses demonstrated the ability to describe a concept in a multi-dimensional fashion characteristic of a more advanced understanding.

Anna's performance on the Balance Beam Task was appropriate for her age.

Age ten:

The 10-year-old hospitalized children with chronic conditions were considerably more responsive. The majority of the children in this age group seemed to have adjusted well to the hospital environment. They understood the daily routines and why things were done the way they were. They underwent their medical treatments in a more relaxed manner than their younger peers because they had a more thorough understanding of their purpose. The majority of children understood the reason for having to wear a hospital gown when going for surgery and not being allowed to eat or drink before a test. For example, a boy with a congenital heart

defect gave the following answer to the nurse's action and rationale in the scenario "hospital gown":

Put it on now ...or I will give you a needle. She will make him put it on. She will tell him why he has to put it on. (R. Why does he have to put it on?). So it is easier....They don't have to start like pulling on him and stuff...try to get off the top so they can...they want to cut. Your own shirt could have germs on it.

The same boy said the following in the scenario "hungry and thirsty":

Say "no" and tell him why he can't have anything to drink. (R. Why?) Because he can't have that before the surgery. (R. Why not?) So you don't, I guess, puke it up and then you choke. Because they want your stomach to be empty.

Most children had a comprehensive understanding of the cause of their hospitalization. For example, the explanation for hospitalization of a 10-year-old girl with cystic fibrosis was as follows:

I have cystic fibrosis and I was coughing and it was very hard to breathe and then my lungs needed to be a little bit cleared out and I also had this bug growing in my lungs and I forget what it was called but...and it was making more and more mucus so I had to have an I.V. and all that stuff. Now it is doing a lot better.

Most 10-year-olds stayed concentrated till the end of the interview. Some children even wanted to complete all three tasks in one session. The 10-year-old hospitalized child with a chronic condition could make appropriate predictions about the nurse's action and also showed the initial signs of abstract thinking. They expressed empathy for the situation the little boy/girl in the stories of the Nurse's Role Task was in and imagined the way he/she might



feel and think. Often they related the little girl/boy's situation to their own (e.g., "Oh I know how that feels..."). A 10-year-old girl suffering from cystic fibrosis, for example, said the following about one of her roommates, a 10-year-old girl who was also suffering from cystic fibrosis:

She (i.e., her roommate) is so quiet and she doesn't want to play with anyone. I think she is really sad about something. Do you think maybe I should go up to her and talk to her?

Tom, a 10-year-old boy with hypospadias, is also a good example of a child who showed compassion for the character in the story and related the little boy's situation to his own. Tom came from Iran a few years ago and had been hospitalized three times before. According to Tom, he had no problem putting himself in someone else's shoes because he has a dog at home which barks when he wants something and which he learned to understand. His mom was a nurse in Iran during the war and she used to talk to Tom about her nursing experiences. She stayed with him during the days in the hospital but left him in the evenings. Tom has an older brother at home whom he admires a lot. His knowledge of the intentions of the nurse was advanced for his age (his mean level score was 5.75) and he showed various signs of abstract thinking by using concepts like "listening to your conscience" appropriately. He often explained the nurse's feelings towards the little boy as her/him feeling "responsible" for the child. Consequently, the reason why

the nurse feels responsible for the little boy is because he is her/his patient for whom she/he is scared that something might go wrong and she/he is to blame. For example, in the scenario "hungry and thirsty" Tom responded as follows:

Makes the nurse feel responsible and scared too. (R. Why?) Because she doesn't want him to.. so she has to watch him all the time and that is a waste of her time. Because she has to help other people that need her and she can't because she has to watch the kid so he doesn't eat anything. (R. Why is it that the little boy is not allowed to eat or drink?) Because after the test.. oh actually when he is having the operation...if he drinks milk he could throw up during the operation and the barf could go into his lungs and he could die or he might have to go to the washroom while he is having the surgery and that will get everything messy. Then she thinks that she doesn't know what to do because if she only follows him around and then the people will be in pain and they will need the nurse but the nurse has to watch the kid. Then she is afraid that she'll ...that the kid will eat something or drink something and she will be confused...she will be confused what to do.

Tom was not only able to interpret the intentions of the nurse by giving a second focus to her/his rationale behind her/his actions but he also showed empathy for her/his role. He gave a human touch to the nurse's personality by describing her/him as trying her/his utmost to improve the little boy's well-being. He acknowledged the fact that nurses can also be worried about making mistakes and that they are responsible for their actions. For example, in the situation about I.V. bottles he described the nurse's thinking and feeling as follows:

(R. What will the nurse think then?) She thinks about why the kid is calling out for help. (R. Why?) Well because the kid doesn't know what is happening... he thinks the needle might have cut his vein and he could

die or something or he did something wrong and the thing is broken and his parents have to pay for it. (R. So how does that make the nurse feel?) It makes her feel responsible because she should have told him before if that goes beeping, he shouldn't be nervous....he should have been told...she should have told him.

His knowledge of medical procedures went beyond the concrete dimensional thinking characteristic of his age group. For example, in the scenario "blanket" his response for the nurse's thinking about giving the little boy a blanket was as follows:

She thinks that the kid might catch a cold (if he shivers) and he might get infected when he has his operation. (R. Why?) Because if he catches a cold the operation...part of the operation..he could easily get infected and then he might have to stay in for six months and I don't think anybody would like that (*nurse's thoughts go one step beyond the direct observable situation*).

Tom often used abstract notions such as "feeling embarrassed," "feeling responsible," "getting confused," "feeling comfortable," and "being worried" and was able to interpret these notions in several ways. For example, in the scenario "teddy bear" he referred to the nurse's feelings as follows:

It makes her feel sort of responsible. (R. Why?) Because she doesn't know where the parents are ...but she should know that (*first interpretation why the nurse feels responsible*) and also she should know what to do to calm down this kid and she should know what to say...well she doesn't (*second interpretation why the nurse feels responsible*)..so she feels responsible but she really isn't.

Or in the scenario "blanket" he said the following about the little boy's feeling and the consequent actions of the

nurse:

Well he feels cold and he is maybe afraid he might wake up his friend sitting ...that is sleeping beside him (*Tom shows compassion for other people*) so he is trying to yell for help quietly but then he *is worried* that the nurse won't hear him. (R. So what will the nurse do when she hears him?) The nurse will come and give him an extra blanket and sort of warm him up and tell him it's okay...I will shut the door so the wind ...so the cold air won't come in and then so the kid isn't cold any more. (R. Why does she do all that?) So she could be a better nurse...so she won't lose her job and she could help out other.. That's what her job is and that is what she likes to do so that's why she wants to help out people. So she *is always worried* what to do. And the kid shouldn't *be worried* because the nurse is really nice so he doesn't need to worry.

His articulate description of other people's action not only manifested itself in his knowledge of the nurse's behaviour but also in that of his mother. For example, he gave his mom advice about and reasons for bringing coffee to the hospital.

Oh she (mother) is going to get some coffee (in the cafeteria of the hospital)... I tell her all the time she should spare her money (advice 1).. she should bring coffee from home (advice 2)... it's much better (rationale behind advice)... she has those tea cup things that you go camping with... I tell her to bring coffee here with that tea cup thing but she won't listen (stubborn characteristic of mother) and she spends her money...I tell her, save your money for something better (advice 3).

Tom's levels of comprehension on the Task of Intrapersonal Understanding and the Balance Beam Task (mean level score 4.5) were also moderately advanced. His performance on the Task of Intrapersonal Understanding fluctuated. He was advanced in his understanding of the concepts "good" and "bad" (both level 5) but not of "happy"

and "sad" (levels 2 and 4, respectively). His explanation of the concept "good" was as follows:

When you help out others and do certain things. When you don't do anything bad. You recycle...when you don't do drugs and you obey the law (abstract notion). You are helping out others.. you are listening.. you are obeying the law...and you are listening to your angel....your guardian (your inner voice). (R. And when you are listening to your guardian angel where does the goodness come from?) Your heart (internal source).

Tom was an intelligent boy who liked doing the interview. It appeared to distract him from his own physical discomfort. Factors other than his chronic condition might have influenced his advanced understanding not only of the nurse but also of people in general. For example, the fact that his mother was a nurse in Iran during an extremely stressful time of war, might have contributed to his mature understanding of the medical world. She often talked with him about her personal experiences as a nurse. Moreover, Tom wanted to become a heart surgeon himself in the future which made him eager to learn about certain hospital procedures.

#### Summary

Five quantitative analyses were conducted to examine the research questions originally posed. Furthermore, illustrative findings were described for each age group to provide the reader with some contextual information about the circumstances under which the data were collected. One child within each age group was discussed in further detail. These children demonstrated an advanced understanding of the

hospital nurse's role.

Both the results of the quantitative analyses and the illustrative findings of the data will be discussed further in the next chapter.

## CHAPTER VI

### DISCUSSION

The primary goal of the present investigation was to outline the development of the understanding of the hospital nurse's role by hospitalized children with chronic conditions. This chapter will address the following five areas: (1) the five research questions originally proposed, (2) summary and conclusion, (3) limitations of the study, (4) areas of interest for future research, and (5) significance of the study.

#### Discussion of the five research questions.

For clarity, each research question will be discussed separately, taking both the quantitative and contextual description of the data into consideration.

Question A. Do the mean level scores of Case's stages of cognitive development coincide with the mean scores of children with chronic conditions on their perception of the hospital nurse's roles (i.e., care, protection, nurturance, and teaching)?

From the results obtained, it appears that the progression of hospitalized children's understanding of the hospital nurse's role is congruent with Case's (1992) stages of development. Furthermore, these findings are supportive of Fischer and Pipp's (1984) theoretical argument that

changes in children's role acquisition are related to age. In accordance with the results obtained, there was a significant main effect for age and not for nurse function or pictures nested within the nurse function. No significant interaction effects were found.

However, this study was particularly focused on determining if there were any advancements in the child's level of understanding of the hospital nurse's role. This interest sprang from Case et al.'s (1988) hypothesis that a child's cognitive development may be accelerated within a specific domain when there is some sort of crisis event that occurs within that domain. According to the results of the present study, some acceleration in cognitive development was found for the 8- and 10-year-olds, being of the order of one-third of a substage (i.e., approximately 8 months). These findings support Hurst's (see Case et al., 1988) study about children who experienced the loss of a loved-one prior to age five. These children showed an acceleration in their understanding of death of the order of one-third of a substage. On the contrary, 6-year-olds did not show any notable acceleration in their understanding of the hospital nurse's role; nor did they demonstrate any regression in their rate of cognitive growth within the social domain.

These results contradict some studies which suggest that a chronic condition may impede a child's expected rate of development (Perrin & Gerrity, 1981, 1984; Watterson-



Wells, DeBoard-Burns, Cook, & Mitchell, 1994; Yoos, 1987). Perrin and Gerrity's (1984) study, for example, emphasized a potential delay in development that may occur in the context of a chronic condition depending on individual differences in temperament and personality, the family's interpersonal functioning, social support network and finances, siblings' and peers' responses to the child with a chronic condition, and the responses of teachers, physicians, nurses and other professionals. Moreover, Watterson-Wells et al. (1994) stated that a child who grows up in a hospital setting may miss many of the early life experiences such as certain biological, psychological, and social events which may lead to delayed development of many psychosocial skills.

Although these issues must definitely be taken into consideration when examining children with chronic conditions, it should also be noted that children with chronic conditions, when having the proper support and guidance, may learn from their experiences in a positive fashion. Fischer and Pipp (1984) support this notion. They state that environmental support is one of the most potent conditions under which spurts in development may occur. According to Fischer and Pipp, children with the proper support and guidance from their environment may perform at or near their upper limit in the related domain (i.e., in this study the social cognitive domain).

The more advanced understanding of the hospital nurse's

role at the 8- and 10-year-old level may be explained several ways. First, as was stated by Case et al. (1988), many specific situations that are emotionally disturbing for the child can lead to an acceleration of the child's cognitive growth in the relevant domains. In order for a hospitalized child with a chronic condition to cope with an environment that is often considered emotionally disturbing (Eiser, 1990; Perrin, 1993), he/she increases the amount of time spent in thinking about his/her situation and is driven by his/her feelings to reconstruct a new understanding of it (Case et al., 1988). Consequently, this may result in advanced social role understanding by 8- and 10-year-old children with chronic conditions because of more frequent exposure to hospitalization and medical treatments.

Second, 8- and 10-year-old children have had more time than 6-year-olds to come to terms with their hospitalizations and their chronic condition. According to Perrin and Gerrity (1984), school-aged children with a chronic illness seek answers to their questions relating to their illness in order to give it meaning and to give them a sense of control over it. Consequently, a 6-year-old child with a chronic condition may have just begun to seek answers about his/her own condition and the required hospitalizations that come with it.

Third, children with chronic conditions have frequent and prolonged contact with adults when hospitalized or

receiving treatments. These children are frequently exposed to adults (e.g., parents, nurses, and doctors) who are themselves adjusting and seeking to understand the implications of the child's condition. For example, children may notice the anxiety and tension of their parents when they have to go for surgery or they may sense the shock and disbelief their parents go through when notified of their condition (Turnbull & Rutherford Turnbull, 1990). Furthermore, parents, nurses, and doctors often are the ones who communicate with the child about the cause of his/her condition and the reason for certain medical procedures. They also are responsible for helping the child to adjust and cope with the situation. Thus, children's social role understanding may be accelerated through their close observance of the adults' perception of the situation (e.g., parents, nurses, and doctors). For example, most 8-year-old and 10-year-old children's responses showed empathy and mature understanding of the hospital nurse's role, an understanding that went beyond Case's (1992) categorization of the dimensional way of thinking. These children were not only able to explain the nurse's intentions for her/his actions but they could also identify with her/his role by interpreting the nurse's feelings and thoughts as if they were their own. Some children were able to speak of their parents' feelings relating to their child's medical treatments. A remarkable awareness of other people's

feelings and thoughts were found among children within these age-groups. It appeared that some 8- and 10-year-olds were able to demonstrate much compassion towards other people.

Fourth, the hospital environment itself may also contribute to advancement in social role understanding. Perrin (1993) noted that increased exposure to the hospital environment may help children to further their social awareness. According to Perrin, hospitalization may provide an opportunity for children to increase their understanding of their illness and their participation and sense of competence in their care. Furthermore, a hospital environment provides children with the opportunity to interact directly with health care providers and other children about their illness. A hospital stay also may be a time for children to expand their social networks in a non-threatening way because they meet other children with medical concerns similar to their own which may in turn contribute to an advancement in social role understanding.

Havermans and Eiser (1994) state similar beliefs about siblings of a child with cancer. They suggest that a majority of siblings benefit from their experiences of having a sister or brother with cancer. These siblings seem to adopt different values in life, feel more mature and become more caring toward other people as a result of their brother/sister's condition.

Walker's (1993) study shows similar results. She

states that siblings of oncology patients score significantly higher in five areas of prosocial behaviour (i.e., helping, giving gifts, praising, sharing, and showing affection). Walker also suggests that a life-threatening disease may facilitate advancement in emotional development by creating more opportunities for prosocial behaviour.

According to the results of the present research, it can be assumed that it is not only the siblings of children with chronic conditions who benefit from their experiences with these conditions, as was suggested by Walker (1993) and Havermans and Eiser (1994), but also the children with the chronic conditions themselves. Their personal experiences with their chronic condition as well as its required medical treatments may increase their awareness of other people's intentions, feelings, and thoughts. This was especially apparent with some 8- and 10-year-old children in this study who were able to demonstrate a higher level of understanding of the nurse's intentions, feelings, and thoughts which they were then able to transfer to themselves and other people.

This latter observation supports Case's (1992) notion of central conceptual structure. That is, children are able to transfer their level of knowledge within the same domain (e.g., projection of other people's thoughts, intentions, and feelings to their own), in this case the social domain. The transfer of within-domain knowledge is supported by McKeough's (1992b) study, in which she used various tasks

within the social-cognitive domain. She trained an experimental group to construct stories that were one developmental level higher than those they would tell spontaneously. These children were not only able to accomplish this, but they also transferred their learned knowledge to other intentional tasks, such as the mother's role tasks developed by Goldberg-Reitman (1992) and empathy tasks designed by Bruchkowsky (1992). In other words, hospitalized children with chronic conditions who show an advanced knowledge of the hospital nurse's role may well be able to transfer this knowledge to other roles (e.g., the mother's role).

Though the majority of hospitalized children with chronic conditions scored either at or above an age-appropriate level in their understanding of the hospital nurse's role, a few 6-, 8-, and 10-year-old children were delayed. Some of such cases can be explained by the degree of illness at the time of interviewing. One consequence of their current condition was that their answers were short and vague which often resulted in the examiner's decision to postpone the continuation of the interview. Consequently, since completed stories could not be repeated, such a child's overall score usually fell below his/her actual level of understanding.

Some of the children's lower scores do not have any apparent explanation. It may be suggested, though, that

these children were still in the initial stages of adapting to their condition or to a recent change in their condition and that, consequently, they were not yet able to fully cope with their medical treatments and hospitalizations. The results of Olson et al.'s (1993) study support this notion. Olson et al. imply that the rate of expression of cognitive coping strategies increases with age. Furthermore, they suggest that children with chronic conditions may gradually develop cognitive strategies to deal with familiar painful events in situations specific to them. For example, in the present study, the examiner learned that one child who showed a delay in his understanding of the hospital nurse's role had just undergone dialysis for the first time only two months before the interview. As a result of this new medical treatment, the little boy would have had to familiarize himself with a totally new routine of having dialysis a few times a week. His way of dealing with the new situation seemed to be to answer the questions by escaping into a fantasy world and by avoiding any realistic conversation about the hospital nurse's role. Possible effects of toxicity from inadequate excreted waste products, however, may also have somewhat contributed to this little boy's delayed performance on the Nurse's Role Task.

Another explanation for the delayed understanding in some children could be that at each level of development individuals are functioning under certain processing

constraints (Case, 1992). That is, children can only manipulate a finite set of symbols (be they sensorimotor, representational, or abstract) for any single operation. Case's (1992) model of development, with influence from Pascual-Leone (1976), incorporates this notion of limited capacity. Case stresses the importance of the maturity and limited information-processing capacity of working memory at certain (sub)stages of cognitive development. Consequently, a child whose working memory is preoccupied with processing numerous new stimuli, such as new medical treatments, might show a temporary delay in his/her cognitive development.

Furthermore, as was mentioned in Perrin, Ramsey, and Sandler's (1987) report, it should be stated that differences in social development in children with chronic conditions may be caused by variations in individual characteristics (i.e., age, gender, socioeconomic status, intelligence, and temperament), and illness characteristics (i.e., severity, visibility, prognosis, social stigma, and care requirements). Perrin et al.'s study emphasized the direct contribution of various characteristics of a long-term physical illness to the development and competence of an affected child.

The number of hospitalizations (i.e., in this study two or more) didn't appear to influence the child's level of nurse's role understanding. Some children, for example, who were hospitalized more than 10 times were advanced in their



understanding while others were either delayed or scored at an age-appropriate level. This may be explained by the following two possibilities. First, as was mentioned by Perrin and Gerrity (1984), individual differences in children's personality, temperament and environmental factors may cause fluctuations in children's level of understanding. Second, it may be hypothesized that a ceiling effect may occur for the number of hospitalizations. This may be due to processing constraints of the working memory which was discussed before or to habituation of the child to the hospital environment. That is, children may initially grow from their hospital experiences but may eventually adapt to them in such a way that they become familiar situations for them. Olson et al. (1993) support this by stating that children with chronic conditions may learn cognitive strategies for the familiar painful events in situations specific to their care and may, therefore, habituate to them.

Through analyzing the content of the data it was apparent that although one 8-year-old boy could understand the good intentions of the nurse, he also referred to her/his actions as "being mean." Brewster (1982) and Eiser (1990) support this notion. These authors state that children can come to believe that doctors and nurses intentionally inflict pain. Brewster's study, for example, found that children aged 7 to 10 years understand that

treatment is intended to help them get better but that they can be limited in their ability to infer empathy.

Furthermore, it was noted that a few 6- and 8-year-olds and the majority of 10-year-olds could give an accurate description of the duties of the hospital nurse, that is, 1) nurses are there to help children, 2) nurses have a responsibility for the well-being of her/his patients, 3) nurses want to improve the physical and emotional health of her/his patients, 4) nurses also see their own shortcomings in their care for children and have good intentions, and 5) nurses are human and have their own feelings, thoughts, doubts, and ideas.

Moreover, the results indicate an age-appropriate understanding of the hospital nurse's role by 4-year-olds, and are supportive of Nelson's (1986) script theory. Although a limited number of cases was examined in this study and no statistical analysis could be performed, results suggest that 4-year-olds are able to predict behavioral sequences in others appropriately. Four of the five 4-year-olds were not yet able to understand that nurses have intentions for their actions. In other words, they did not approach the dimensional stage (Case, 1992). However, one 4-year-old girl showed the initial signs of dimensional thinking by referring not only to the nurse's actions but also to some intentions the nurse might have for her/his actions. The notion of a major shift in development that

takes place between ages 4 and 6 can not be fully supported by the present study due to the limited number of 4-year-old children examined.

Of course, it could be argued that the advancement in understanding of the hospital nurse's role by 8- and 10-year-olds could be an artifact of the scoring criteria that were employed. Scoring criteria of several Neo-Piagetian studies (Goldberg-Reitman, 1992; Griffin, 1992; McKeough & Martens, 1994; Salter, 1993) along with one Piagetian study (Selman & Byrne, 1974) that examined the social-cognitive domain were consulted in a direct and explicit attempt to induce a common structure across age. In fact, another interpreter of the current data who has the intention to discover regressed understanding across all ages might have been able to reduce the observation of an advanced understanding to nil by searching for and identifying consistent signs of age-appropriate and/or delayed understanding among responses to different situations. While this argument has some validity, it should be noted that 1) the present scoring system included objective criteria; 2) good levels of reliability emerged, that is, the criteria identified can be considered reliable as a function of objective reliability testing; 3) as was stated before, scoring criteria of several highly respected studies were consulted to obtain valid and reliable scoring criteria; 4) although the overall mean scores of the 8- and

10-year-olds showed an advancement, by using the scoring criteria a few observations of delayed understanding also were observed; and 5) although others may find alternative features which do in fact differentiate responses to the various stories in the present data, and although others perhaps would not choose to focus on the criteria dealt with in this study, these factors do not negate the fact that the commonalities found between subjects within each age group are present and reliable.

Although future research is obviously indicated, the present results suggest that 8- and 10-year-old hospitalized children's understanding of the hospital nurse's role is advanced on the order of one-third of a substage and that 4- and 6-year-olds score at age-appropriate levels on this task.

Question B: Do the mean level scores of Case's stages of cognitive development correspond with the mean scores of children with chronic conditions on a causal reasoning task?

As was predicted by theory (Case, 1992), the children in this study demonstrated progression of their levels of causal reasoning with age. The results indicate that there were significant differences between the three age groups. When examining the means of the three age groups on the Balance Beam Task, the 6-year-olds are slightly advanced in their level of causal reasoning, whereas the 8- and 10-year-olds demonstrate performance slightly below but very close

to the predicted scores and correspond to Marini's (1992) findings with the Balance Beam Task.

Further discussion will follow in the next section which looks at the observed difference in level of understanding between the Nurse's Role Task and the Balance Beam Task.

Question C: Are the mean scores of children with chronic conditions on their perception of the hospital nurse's role advanced as compared to their mean scores on causal reasoning?

Results indicate no significant differences between mean scores on the Balance Beam Task and the Nurse's Role Task for groups 1 and 3, 6- and 10-year-olds, respectively. These results are contrary to the predictions posed in this study. It was assumed that hospitalized children with chronic conditions would score significantly higher on the Nurse's Role Task than on the Balance Beam Task. However, it should also be noted that the power of the  $t$ -tests for groups 1 and 3, 6- and 10-year-olds, respectively, was low. This means that the risk of making a Type II error is of great concern. In other words, the risk of concluding that there are no significant differences between mean scores on the Balance Beam Task and the Nurse's Role Task for groups 1 and 3 when, in fact, there are true differences, is high. The small sample size (i.e., only 10 subjects for each  $t$ -test) may have negatively influenced the power.

Despite these statistical results it can be concluded that 10-year-olds' level of understanding on the Nurse's Role Task is approximately half a substage more advanced than their level of causal reasoning. Though not statistically significant, these results favour the predictions initially posed.

However, a higher level of understanding on the Nurse's Role Task was not observed with the 6-year-olds. Their level of understanding on the Nurse's Role Task, though age-appropriate, was slightly lower than on the Balance Beam Task. This could be for several reasons. First, 6-year-olds were less able on the Nurse's Role Task than on the Balance Beam Task to concentrate till the end. The nature of the Balance Beam Task was such that it allowed for only one right answer and was a relatively short task to administer, as compared to the Nurse's Role Task, which was a much longer and diverse task and asked for a longer attention span. Second, with the Balance Beam Task the outcome of the question was directly observed by the child. The suspense, whether the child's prediction was right or not, appeared to add to his/her level of concentration. In addition, a right prediction gave the child a feeling of success (despite the fact that the prediction might be insufficiently explained by the justification) which also added to the child's level of concentration.

Contrary to the 6- and 10-year-olds, the 8-year-olds'

level of understanding on the Nurse's Role Task was significantly higher than on the Balance Beam Task. This advancement (i.e., approximately two-thirds of a substage) in understanding of the hospital nurse's role is in agreement with the predictions originally posed. It is also in accordance with Case et al's (1988) assumption that a child with intensive experience in one domain will show a slight acceleration in development in that domain but not necessarily in another. This advancement could partially be explained by the fact that 8-year-olds had a higher ceiling than 10-year-olds on the Nurse's Role Task. That is, 8-year-olds could score up to a level 6 which is 3 substages higher than their prototypical level of performance (i.e., level 3), whereas 10-year-olds could also score up to level 6, which is only two levels above their prototypical level of performance (i.e., level 4).

Question D: Do the mean level scores of Case's stages of cognitive development coincide with the mean scores of children with chronic conditions on their intrapersonal understanding (i.e., happy, sad, good, and bad)?

Results indicate that children's overall understanding of the Concept Task significantly progresses with age which supports Case's (1992) theory of development. However, though Griffin's (1992) results demonstrated a consistency of children's performance across the four tasks, this was not apparent for the concept happy in the present study.

Ten-year-olds scored approximately one substage higher on the concepts sad, good, and bad than on the concept happy. Consequently, after performing univariate tests it was noted that no significant difference for age was found for the concept happy. That is, the mean level of understanding of the concept happy by 6-, 8-, and 10-year-olds was approximately equal (see also Table 17, p. 157). This insignificant difference could be explained as follows.

First, the concept happy was presented to the subjects as the first research item of not only the task but also the whole research protocol. Therefore, it could be argued that the 10-year-old subjects were not acquainted with the research format yet and that their scores for this item were depressed due to the unknown situation of the testing environment. A counterbalanced procedure, which varies the order of presentation of the tasks, is recommended for future research to control for first-research-item effects.

The question remains, however: Why didn't 6- and 8-year-olds (i.e., their score on the concept happy was two-fifths of a substage higher than the prototypical level and at an age-appropriate level, respectively) show a similarly regressed mean score? To answer this question, it can be argued that the mean score of the 10-year-olds on the concept happy was artificially depressed by the low score of four children (i.e., their score was 2). Two of these four 10-year-olds were feeling quite sick at the time the task



was given. Their performance was two substages below the prototypic level on the concept happy and one substage on the concepts sad, good, and bad. The low score of the other two children cannot be explained. These low performances by four subjects will noticeably influence the mean scores when the sample size is small (i.e., each score carries 10% of the power to influence the score). However, the following argues in favour of their low performance on the concept happy.

Second, one could also argue that the nature of the concept happy invites a hospitalized child to think about better and more joyful times than he/she currently is in. It can be assumed that a hospitalized child might want to explain the word happy by mentioning happy events and/or memories in order to escape his/her own seemingly sad situation. As a result, an answer for the concept happy, which consists of only adding up all the joyful/happy events a hospitalized child might think of without referring to feelings and judgements, is scored at a lower age-level (i.e., level 1 or 2 responses which are primarily script-based) than is predicted by theory (Case, 1992).

Contrary to the 10-year-olds, the 6-year-olds scored approximately two-fifths of a substage higher than their age-level on all four concepts. Some 6-year-olds were able to mention several judgements and feelings to explain a concept. In order to check if the content of their

judgements was understood, the examiner requested and was given more justified clarifications. This advanced understanding is in favour of the prediction that hospitalized children are advanced in the social cognitive domain and supports McKeough's (1992b) transfer paradigm which will be discussed in the next section.

Furthermore, it is interesting to note that 6- and 8-year-olds were advanced in their understanding of the concept sad and all three age-groups were advanced in their comprehension of the concept bad. That is, some 6- and 8-year-olds could explain the concepts sad and bad by referring to multiple judgements and feelings which is characteristic of the elaborated multiple dimensional substage. Moreover, some 10-year-olds went one step further by interpreting the word bad in an abstract dimensional manner. Both concepts (sad and bad) have a negative connotation to them which could be congruent to the situation the hospitalized child is in. Some children supported this notion of a negative connotation through explaining the words bad and sad by referring to their own circumstances which is characteristic of a higher level of thinking.

Through analyzing the content of the data, it was evident that the majority of 4-year-old children explained the four concepts by mentioning observable events, external actions or objects which is congruent with Griffin's (1992)

findings. Moreover, if the child's answer referred to an intentional state, such as feelings and judgements, this was usually done without mentioning a behavioral event related to the intentional state.

Question E: Does advanced understanding of the hospital nurse's role correspond to advanced understanding on another task which is social in nature? In other words, do the mean scores of children with chronic conditions on their perception of the hospital nurse's roles coincide with the mean scores of their intrapersonal understanding?

Results indicate that, overall, 10-year-olds scored significantly higher on the Nurse's Role Task than on the Task of Intrapersonal Understanding. This contradicts the idea that two tasks within one domain (i.e., the Nurse's Role Task and the Task of Intrapersonal Understanding) that share the same central conceptual structure should show the same level of understanding for both tasks and disputes the presence of a transfer paradigm (McKeough, 1992b). However, it could be argued that the pictures of the Nurse's Role Task, which were specially designed for this specific group of subjects, provide more realistic and comprehensive cues for children who are hospitalized than the Task of Intrapersonal Understanding. The pictures relate to their present situation and, therefore, seem to evoke more elaborate responses from the children. In addition, the majority of hospitalized children with chronic conditions

who were examined for this research had an extensive amount of experience of being hospitalized and, consequently, were well acquainted with the role of the hospital nurse (see also Table 12, p. 147). As was mentioned in the previous section, these significant differences may also be the result of the extremely low mean score by 10-year-olds on the concept happy which caused an overall depressed mean score on the Task of Intrapersonal Understanding.

Though no significant difference between the 8-year-old subjects' understanding of the Nurse's Role Task and the Task of Intrapersonal Understanding was found, a similar stand can be taken for this age-group. Their overall score on the Nurse's Role Task was approximately two-fifths of a substage higher than on the Task of Intrapersonal Understanding. They also showed a moderate advancement in their understanding of the hospital nurse role (i.e., one-third of a substage) while their level of Intrapersonal Understanding appears age-appropriate. Contrary to the 10-year-olds, however, these insignificant findings support the predictions initially posed and strengthen the notion of a central conceptual structure. That is, a child's performance on two tasks within the same domain should be similar. However, it should also be noted that the power of the  $t$ -test for group 2 (i.e., 8-year-olds) was low. This increases the risk of making a Type II error and means that cautiousness of making a false conclusion is indicated.

That is, concluding that there is no significant difference between 8-year-old's level of understanding on the Nurse's Role Task and the Concept Task when, in fact, there might be.

Six-year-old children's level of understanding on the Nurse's Role Task was significantly lower than on the Task of Intrapersonal Understanding. This significant difference contradicts both McKeough's (1992b) notion of a central conceptual structure and the predictions initially posed. The sections that deal with questions A and D provide arguments to justify 6-year-olds' prototypic level of understanding on the Nurse's Role Task and advanced level of comprehension on the Task of Intrapersonal Understanding, respectively.

#### Summary and Conclusion

This study provided a variety of data to analyze perceptions of the hospital nurse's role in hospitalized children with chronic conditions. The main purpose of the study was to achieve a better understanding of the child's point of view with respect to certain problem situations experienced when hospitalized which are related to the role of the hospital nurse. Another objective of this study was to conduct a developmental analysis of perceptions of the hospital nurse's role by children with chronic conditions within the framework hypothesized by Case (1992).

Case's (1992) neo-Piagetian theory provided a basis for

analyzing and interpreting the data by acknowledging the influence of specific factors on development. Specific factors take into consideration the environment the child lives in and the cultural and linguistic background the child grows up in. A hospitalized child with a chronic condition has different experiences than a healthy child which have a significant influence on his/her development (Committee on Children With Disabilities and Committee on Psychosocial Aspects of Child and Family Health, 1993).

The child was given three tasks (i.e., the Nurse's Role Task, the Balance Beam Task, and the Task of Intrapersonal Understanding) at his/her bedside. The Nurse's Role Task, which was specifically developed for this research, addressed eight problem situations that were common to the hospital environment. The Task of Intrapersonal Understanding and the Balance Beam Task were also given in order to detect the presence of an underlying central conceptual structure to account for domain-specificity in development as was predicted by theory (Case, 1992).

Results indicated a moderate advancement in understanding of the hospital nurse's role by 8- and 10-year-old hospitalized children with chronic conditions and an age-appropriate level of understanding of the hospital nurse's role by 6-year-olds with chronic conditions. Although no quantitative analysis could be performed, the five 4-year-olds who participated in this study also showed

an age-appropriate understanding of the hospital nurse's role. However, contrary to what was predicted by theory (Case, 1992), the presence of an advanced central social structure was not consistently apparent because no significant difference in level of understanding was found for 6- and 10-year-olds on the Balance Beam Task and the Nurse's Role Task and no congruent level of understanding for the 6- and 10- year-olds on the Nurse's Role Task and the Task of Intrapersonal Understanding was apparent. Justifications and arguments have been provided to explain these results.

Though the stressful aspects of hospitalization may temporarily disrupt the quality of children's cognitive functioning, it may advance their level of social understanding in the long run. By working through very stressful and sometimes traumatic events, children gain a considerable amount of knowledge. They learn what kind of impact certain pain and fear have on themselves and, consequently, they can project these experiences onto the feelings of other people. Such working through increases children's empathetic and social awareness. Believing in and supporting children's capability to positively make sense out of their experiences will allow them the space to adapt to and further their understanding about their chronic condition.

#### Limitations of the Study

The limitations of this study revolve around the extent to which the results can be generalized to other populations. Generalizability depends upon the nature of the sample, in this case a convenience sample, and the methodology employed.

The sample did not contain all possible clinical subjects because 1) a small non-randomized sample was used, 2) some parents refused permission for their children's participation, and 3) some children failed to complete all three tasks. No reason for the lack of parental permission was asked for but in some cases parents reported that they felt their child had been subjected to enough testing. In some other cases parents indicated that their child refused to take part in a study which emphasized hospital nurse's care and medical treatments because these were aspects that caused the child a great deal of stress and anxiety. Consequently, the nature of the sampling criteria make it necessary to examine a larger population of hospitalized children with chronic conditions in order to generalize the obtained results.

In addition, the nature of the Nurse's Role Task is such that it asks the child about certain medical procedures such as wearing a hospital gown when going for an operation or not being allowed to eat or drink when going for a test. In a few cases, the scenario of the story was not applicable to the situation of the child being tested. For example, a



child with juvenile arthritis does not necessarily have to undergo surgery. Although little knowledge about certain medical procedures usually did not interfere with their level of understanding on the Nurse's Role Task, these children were little acquainted with the rationale behind the nurse's action. Consequently, they had difficulty responding to some of the questions.

Moreover, it was mentioned that the concept happy of the Task of Intrapersonal Understanding may not be an appropriate measure to obtain a maximum level of intrapersonal understanding for some hospitalized children with chronic conditions. Especially, 10-year-olds who are well aware of their situation may answer below their level simply because the word happy reminds them of better times and provokes a response containing an enumeration of events characteristic of a lower level reply (i.e., a level 1 or 2 which primarily accounts for script-based explanations).

Furthermore, possible side-effects of medication and/or illness may have depressed some children's level scores. Though this aspect is hard to control for in a hospital setting, and among children with chronic health conditions, it is necessary to take this issue into consideration when evaluating the findings.

Some of the responses that were observed in this study could also be due to conditioning. For example, children could be regurgitating known approved positions or lines.

Although the examiner tried to account for this as much as possible by having the child explain and justify their expressions, it may have influenced some children's scores.

In addition, the low power found in some of the t-tests that were conducted for questions C and E should be taken into consideration when interpreting the data. As was mentioned in the sections that dealt with questions C and E, the chance of making a Type II error was high. A larger sample size is indicated for future research to reduce this risk.

Lastly, the constraints of time and place of investigation made it necessary for the researcher to examine a couple of children in a shorter time frame than was preferred. This fact combined with the distracting environment of the hospital, may have somewhat depressed these children's scores.

Overall, however, the results of this study indicate a moderate advancement in understanding of the hospital nurse's role by 8- and 10-year-old hospitalized children with chronic conditions despite all the constraints and limitations faced by the examiner. Furthermore, this study has attempted to address the criticisms of methodological weaknesses which Burbach and Peterson (1986) found in previous studies, that mainly dealt with children's understanding of illness-causality, by performing inter-rater reliability in order to minimize the effects of

observer bias and expectance effects, by obtaining high and average reliability coefficients for the Nurse's Role Task and the Task of Intrapersonal Understanding, respectively, and by providing adequate description of samples, instruments and procedures.

In the next section suggestions for future research will be given.

#### Areas of Interest for Future Research

The following two sections are similar in nature as they both express areas of future interest for either researchers or health care professionals. However, the first section, "suggestions for elaboration and improvement of the present study," is derived from the current findings whereas the second section, "suggestions for related future research topics," results from mainly the researcher's personal experiences and observations while collecting the data.

#### Suggestions for Elaboration and Improvement of the Present Study

Though the present investigation has provided insight into the nature of the developmental process of the perception of a hospital nurse's role by hospitalized children with chronic conditions, its results were based on a relatively small sample size. Furthermore, the nature of the sampling criteria made random sampling impossible, and therefore, a convenience sample needed to be used. However,

in order to fully support the notion of advanced social role understanding by children with chronic conditions and to be able to generalize the obtained results, a larger sample size is required. This could be realized by pooling data from different centres which may permit randomization.

In addition, the present study focused on the role of the hospital nurse in relation to a young hospitalized child within certain common hospital situations using Case's (1992) theory of development. How does the hospitalized child with a chronic condition relate to other familial and/or well-known roles (e.g., the doctor, his/her mother or father, his/her peers). Though the present data show some evident signs of transfer of advanced understanding to other roles, this was not its original focus. Further studies should investigate whether the advanced understanding of the hospital nurse's role by hospitalized children with chronic conditions is also transferred to their comprehension of other roles. In other words, does an advanced role understanding by hospitalized children with chronic conditions exist in general and, consequently, is the presence of an underlying central conceptual structure confirmed?

It would be particularly interesting to examine if an advanced level of social role understanding by children with chronic conditions also relates to their level of understanding of how other people (e.g., the nurse) perceive

them? An elaborated version of the Nurse's Role Task could function as a basis for such a study.

Moreover, the present study supported some notion of an advanced central conceptual structure for the 8-year-olds by comparing their level of understanding of the hospital nurse's role with their level of comprehension of intrapersonal concepts. However, 6- and 10-year-old children scored significantly differently on both tasks which contradicted the predicted notion of an advanced central social structure. Though the possible causes of the differences in performance have been discussed, further study is indicated.

Furthermore, the sampling criteria of the present study requested the examination of children with chronic conditions who were hospitalized more than once and were beyond their diagnostic phase in order to observe children who had extensive hospital experiences and to eliminate the participation of those children who were dealing with the stress of adapting to a recent discovery of a chronic condition. However, there was also an indication of regressed social role understanding by children who had a recent dramatic change in treatment and/or chronic condition. It would be interesting to examine the time-span (i.e., how long will it take the child to adjust to the new medical treatment and/or change in chronic condition) and the extent of potential delay under these new circumstances.

Lastly, as was suggested earlier, hospitalized children with chronic conditions are likely to be in closer contact with adults than with their healthy peers which may have a considerable impact on their level of social role development. Future research should examine the amount of impact adult contact has on the level of social role understanding by hospitalized children with chronic conditions. Case's (1992) neo-Piagetian perspective of development could be used to examine this because it takes into account the influence of specific experiences on the child's progression in development.

#### Suggestions for Related Future Research Topics

As the result of interviewing 35 children with chronic conditions within a hospital setting, the researcher not only collected data but also made many personal observations. These observations combined with the findings of the present study have led the researcher to the following five topics/questions which she feels are important areas of research to be examined in the future and which could hopefully point the way towards future improvement of child care within the hospital.

##### 1. Preconceived Notions

- A. Results of this study indicate a moderately advanced understanding of the hospital nurse's role by 8- and 10-year-old children with chronic conditions, contrary to studies that assumed a regressed level of understanding

(Perrin & Gerrity, 1984; Watterson-Wells et al., 1994; Yoos, 1987). This contradiction should raise the question of how we perceive children with chronic conditions and if we really do them justice by making predictions about their level of cognitive development. As Perrin and Gerrity (1984) suggest, each child is different in temperament and personality, comes from a different family and socio-economic background and has different life experiences which also influence his/her rate of development. Individual differences in children's level of understanding were also found in the present study.

- B. Nursing kardexes or medical reports often provide detailed information about a child's emotional and behavioral background. As health care professionals, we should take note of such information but also reserve the right to judge for ourselves. Approaching a child with a preformed perception, which may be created by the information given in a kardex, might negatively influence one's relationship with that child. By partially ignoring the background information given in the kardex or report, it allows the health care professional to establish a fresh relationship with the child. For example, the examiner was aware of the reported aggressive mood swings of a boy suffering from a severe form of spina bifida, but by approaching him with an open

mind it allowed her to observe the boy's positive characteristics and to discover his mature understanding of both the nurse and other people.

Turnbull and Rutherford Turnbull (1990) supported the notion of having a nonjudgemental attitude toward children with exceptionalities. They also emphasized the importance of recognizing the fact that interpretations are different from observations. That is, two may observe the same event but interpret it totally differently. For example, one professional may interpret the aggressive mood swings of the boy with spina bifida as attention-seeking behaviour, whereas another may see it as an expression of pain and frustration. The latter professional will likely deal with the child's behaviour in a more positive manner which will minimize its impact and enhance the relationship with the child.

This leads the researcher to conclude that there can be no sure way yet of predicting the level of social-cognitive development of hospitalized children with chronic conditions and brings to the surface the following question: Do health care professionals have preconceived notions about children with chronic conditions with respect to their social-cognitive development and how do these notions effect their interaction with them?

## 2. The effectiveness of self disclosure.

Self disclosure is a technique which may be used by



health care professionals when dealing with a child's initial fears, stress, and anxiety with respect to hospitalization, new medical treatments, and chronic condition. Dealing with the stresses of a chronic condition in a warm and understanding environment will enhance the child's self-understanding and understanding of others. It was apparent in the observations that a child has to adapt to and familiarize him/herself with the use of new medical equipment/treatment in order to overcome the initial stress and anxiety. For example, a child might respond in shock to the initial use of a ventilator. However, by sharing one's own related medical experiences with the child, either personal or observed, the child's fears might be reduced and he/she may grow from the new experiences.

This concept is referred to as appropriate use of self-disclosure by Gazda, Asbury, Balzer, Childers, and Walters (1984) and is considered an appropriate interpersonal communication skill by Turnbull and Rutherford Turnbull (1990). For example, one little 6-year-old boy with cystic fibrosis, who participated in this study, was very upset when he was told that he had to begin using an aerosol mask several times a day. Through the researcher's sharing of her personal experiences with her initial agony and consequent pride toward the use of a cane, the boy's unhappy disposition was observed to change instantly. He appeared to be relieved and less frustrated with his newly acquired

mask and showed curiosity and pride towards not only his mask but also the cane by walking and running around with them throughout the ward. Another example of effective self-disclosure happened with the 8-year-old boy with spina bifida, who was mentioned in the previous section. This boy was characterized by the nursing staff as having aggressive mood swings. His limited range of motion (i.e., the boy was paralysed from the waist down) seemed to frustrate him to the extent that he often wanted to physically hurt the staff and use abusive language. Through sharing personal experiences of frustration and anger toward a mobility impairment the examiner suffers from, the boy, who initially did not want to cooperate with the interview, calmed down and responded to the questions in a very mature, cooperative and empathetic manner. Consequently no signs of aggressive behaviour were apparent during the interview and a close friendly bond was formed between the examiner and the boy.

The researcher observed the benefits of self-disclosure in helping children to cope with their chronic conditions and hospitalizations. This leads to a second question which is the following: Is self-disclosure an effective technique to be used by health care professionals when working with a child with a chronic condition who is upset, frustrated and confused?

### 3. Children's understanding of their own reason for hospitalization and the nature of their chronic

condition.

Though children's understanding of their reason for hospitalization was not the focus of this research, each child was asked if he/she knew the reason for his/her hospitalization. Consequently, the data of this study indicated that both 4- and 6-year-olds had little understanding of the reason for their hospitalization. Four- and 6-year-old children either did not know the reason for their hospitalization or gave a simple answer referring to external symptoms. On the contrary, 8- and 10-year-olds began to have a good comprehension of not only the reason for their hospitalization but also the nature of his/her chronic condition. These findings support Bibace and Walsh's study (1981) which demonstrated that hospitalized children's understanding of illness-related concepts progresses with age.

Moreover, Shagena et al. (1988) suggested that children's knowledge of disease concepts may be advanced by providing them with health-related information at or slightly above their level of understanding. However, in order to design an effective communication program for children with chronic conditions, Brewster (1982) stressed the need for health care professionals to gather information about how each child views the reason for treatment first before giving information.

Furthermore, Haight et al. (1985) stated that the

health care professional should also realize that children are not totally passive. Children often strive actively to understand many aspects of the medical interview.

Consequently, another possible research topic to be examined would be: How does the child's understanding of the reasons for his/her hospitalizations when suffering from a chronic condition develop and how does this level of understanding benefit the child's well-being during these hospitalizations?

#### 4. Side effects of certain medication.

Hospitalized children are often under the influence of pain medication such as morphine and codeine. Though the majority of health care professionals and/or educators are aware of this, it is easy sometimes to forget or overlook this aspect. Often with good intentions (e.g., wanting to distract the child from his/her pain) we might ask too much from the child or underestimate the child's potential level of functioning. For example, the side-effects of morphine and to a lesser extent codeine may cause the child to feel extremely sleepy, light headed, and dizzy and to have a low attention-span (Reiss & Evans-Melick, 1984). Data from the current research indicate that children under the influence of narcotic medication were considerably less able to concentrate and, consequently, may have scored below their level of development.

These observations lead the researcher to the following

question: How conscious are health care professionals of the side-effects of certain medication in their day to day interactions with the child and do they sometimes overestimate the child's level of functioning when being under the influence of such medication?

#### 5. Parental involvement

The data indicate that children as old as four will comprehend certain medical routines when these routines are explained to them, especially by the family. For example, Denise, the 4-year-old girl with cystic fibrosis who was discussed in Chapter 5, showed a moderate understanding of the purpose of a gastric-tube. Her mother and grandmother discussed medical procedures with her in an open and supportive fashion which allowed her to express her understanding of phenomena which lay beyond the boundaries of perception alone, a characteristic of children at this age-level (Perrin & Gerrity, 1984).

Brewster (1982) supported the involvement of the family to help the child adjust by concluding that the temperament of the child, the severity of his/her illness, and particularly the coping style of his/her family, seemed to be the more significant predictors of adjustment to treatment. Furthermore, Perrin, Ayoub, and Willett (1993) stressed the importance of the joint contribution of the family to the adjustment of a child with a chronic condition. Perrin et al. emphasize the need of clinicians

to collaborate with parents, teachers, and others who participate in the life and care of the child in order to understand the complexity of influences by maternal, family, and illness-specific characteristics.

Consequently, the following question can be raised: What is the effect of the joint effort of health care professionals and parents when explaining certain medical procedures on the child's emotional well-being while in the hospital?

#### Significance of the Study

The detailed outline of how children at different (sub)stages of development perceive the hospital nurse's role, which was provided in Chapter 4, may give health care professionals a more accurate knowledge of how hospitalized children at different ages may perceive their role. It may also prevent health care professionals from either overestimating the conceptual sophistication with which the young child reasons about the motives behind medical procedures or underestimating the older child's understanding of these motives. When health care professionals are aware of the fact that, for example, a 4-year-old child has trouble with understanding the intentions behind their actions (e.g., medical procedures), they can adjust their way of interacting with that child by understanding the child's perception of the situation (i.e., mainly script-based) better and by lowering their

expectations.

Another unique contribution of this study is that it has offered a different outlook on the social-role development of hospitalized children with chronic conditions. Though several studies argued for a potential delay in cognitive development within the social domain by children with chronic conditions (Perrin & Gerrity, 1981, 1984; Watterson-Wells et al., 1994; Yoos, 1987), the present study supports an advanced understanding of the hospital nurse's role by 8- and 10-year-old hospitalized children with chronic conditions, being of the order of one-third of a substage (i.e. 8 months). An advancement of 8 months in nurse's role understanding by 8- and 10-year-olds with chronic conditions can be considered clinically significant and needs to be taken into consideration when interacting with these children. Health care professionals need to be aware that some children with chronic conditions have a better knowledge of other people's feelings, and thoughts and may be approached in a more mature manner when explaining medical procedures to them.

## References

- Ainsworth, M.D.S., Blehar, M.C., Waters, E., & Wall, S. (1978). Patterns of attachment: A psychological study of the strange situation. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Algren, C.L. (1985). Role perception of mothers who have hospitalized children. Children's Health Care, 14, 6-9.
- Appley, M.H., & Trumbull, R. (1967). Psychological stress. New York: Appleton-Century-Crofts.
- Bergmann, T., & Freud, A. (1966). Children in the Hospital. New York: International Universities Press, Inc.
- Bibace, R., & Walsh, M.E. (1979). Developmental stages in children's conceptions of illness. In G. C. Stone, F. Cohen, & N.E. Adler (Eds.), Health psychology (pp 285-301). San Francisco: Jossey-Bass.
- Bibace, R., & Walsh, M.E. (1980). Development of children's concepts of illness. Pediatrics, 66, 912-917.
- Bibace, R. & Walsh, M.E. (1981). Children's conceptions of illness. In R. Bibace and M.E. Walsh (Eds.), Children's conceptions of health, illness and bodily functions(pp 31-48) San Francisco: Jossey-Bass.
- Bowlby, J. (1982). Attachment and loss. (Vol. 1). London: Hogarth.
- Brewster, A. (1982). Chronically ill hospitalized children's concepts of their illness. Pediatrics, 69, 355-362.
- Brodie, B. (1974). Views of healthy children toward illness. American Journal of Public Health, 64, 1156-1159.
- Brown, J., & Ritchie, J.A. (1990). Nurses' perceptions of parent and nurse roles in caring for hospitalized children. Children's Health Care, 19, 28-36.
- Bruchkowsky, M.M. (1992). The development of empathic cognition in middle and early childhood. In R. Case (Ed.), The mind's staircase: Exploring the conceptual underpinnings of children's thought and knowledge (pp. 153-170). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Bruner, J.S. (1986). Actual minds, possible worlds. Cambridge, MA: Harvard University Press.



Burbach, D.J., & Peterson, L. (1986). Children's concepts of physical illness: A review and critique of the cognitive- developmental literature. Health Psychology, 5, 307-325.

Campbell, J.D. (1975). Illness is a point of view: The development of children's concepts of illness. Child Development, 46, 92-100.

Carey, S. (1985). Conceptual change in childhood. London, England: MIT Press.

Case, R. (1978). Intellectual development from birth to adulthood: A neo-Piagetian investigation. In R.S. Siegler (Ed.), Children's thinking: What develops? (pp. 109-150). Hillsdale, NJ: Lawrence Erlbaum Associates.

Case, R. (1985). Intellectual development: Birth to adulthood. New York: Academic.

Case, R. (1987). Neo-Piagetian Theory: Retrospect and prospect. International Journal of Psychology, 22, 773-791.

Case, R. (1992). The mind's staircase. Exploring the conceptual underpinnings of children's thought and knowledge. Hillsdale, NJ: Lawrence Erlbaum Associates.

Case, R., & Griffin, S. (1990). Child cognitive development: The role of central conceptual structures in the development of scientific and social thought. Developmental Psychology, 193-230.

Case, R., Hayward, S., Lewis, & Hurst, P. (1988). Toward a Neo-Piagetian theory of cognitive and emotional development. Developmental Review, 8, 1-51.

Chapman, A.H., Loeb, D.G, & Gibbons, M. J. (1956). Psychiatric aspects of hospitalizing children. Arch. Pediatrics, 73, 77-88.

Chi, M.T.H. (1988). Children's lack of access and knowledge reorganization: An example from the concept of animism. In M. Perlmutter & F.E. Weinert (Eds.), Memory development: Universal changes and individual differences (pp. 169-194). Hillsdale, NJ: Lawrence Erlbaum Associates.

Cole, M., & Scribner, S. (1974). Culture and thought. New York: Wiley.

Committee on Children With Disabilities and Committee on Psychosocial Aspects of Child and Family Health (1993). Psychosocial risks of chronic health conditions in childhood

and adolescence. Pediatrics, 92, 876-877.

Cook, S. (1975). The development of causal thinking with regard to physical illness among French children. Unpublished doctoral dissertation, University of Kansas, Kansas City.

Deutsch, H. (1942). Some psychoanalytic observations in surgery. Psychosomatic Medicine, 4, 105-115.

Eiser, C. (1989a). Children's concepts of illness: Towards an alternative to the "stage" approach. Psychology and Health, 3, 93-101.

Eiser, C. (1989b). "Let's play doctors and nurses": A script analysis of children's play. Early Child Development and Care, 49, 17-25.

Eiser, C. (1990). Chronic childhood disease. Cambridge: Cambridge University Press.

Erickson, F. (1958). Play interviews for four-year-old hospitalized children. Monographs of the Society of Research in Child Development, 23 (Whole No. 69).

Falstein, E.I., Judas, I. & Mendelsohn, R.S. (1957). Fantasies in children prior to herniorrhaphy. American Journal of Orthopsychiatry, 27, 800-807.

Fineman, A.D. (1958). The utilization of child psychiatry on a children's surgical service. American Journal of Surgery, 95, 64-73.

Fischer, K.W. (1980). A theory of cognitive development: The control and construction of hierarchies of skills. Psychological Review, 87, 477-531.

Fischer, K.W., & Pipp, S.L. (1984). Processes of cognitive development: Optimal level and skill acquisition. In R.J. Sternberg (Ed.), Mechanisms of cognitive development, (pp. 45-80). New York: W.H. Freeman.

Freud, A. (1977). The role of bodily illness in the mental life of children. In R.S. Eissler, A. Freud, M. Kris, & A.J. Solnit (Eds.), An anthology of the psychoanalytic study of the child; Physical illness and handicap in childhood (pp. 1-12). New York: International Universities Press. (Original work published 1952).

Freud, A. (1965). Normality and pathology in childhood: Assessment of development. The writings of Anna Freud. New York, International Universities Press.

Freud, S. (1963). On the sexual theories of children. In P. Rieff (Ed.), The collected papers of Sigmund Freud. New York: Collier. (Original work published 1908)

Garbarino, J., & Stott, F.M. and Faculty of the Erikson Institute (1989). What children can tell us. San Francisco: Jossey-Bass Inc, Publishers.

Garmezy, N., & Rutter, M. (1983). Stress, coping, and development in children. New York: McGraw-Hill Book Company.

Gazda, G.M., Asbury, F.S., Balzer, F.J., Childers, W.C., & Walters, R.P. (1984). Human relations development; A manual for educators. Newton, MA: Allyn and Bacon.

Goldberg-Reitman, J. (1984). Young girls' understanding of their mother's role: A developmental investigation. Unpublished doctoral dissertation. University of Toronto, Ontario Institute for Studies in Education, Toronto.

Goldberg-Reitman, J. (1992). Young girl's conception of their mothers' role. In R. Case (Ed.), The mind's staircase: Exploring the conceptual underpinnings of children's thought and knowledge (pp. 135-151). Hillsdale, NJ: Lawrence Erlbaum Associates.

Griffin, S. (1992). Young children's awareness of their inner world: A neo-structural analysis of the development of intrapersonal intelligence. In R. Case (Ed.), The mind's staircase: Exploring the conceptual underpinnings of children's thought and knowledge (pp. 189-206). Hillsdale, NJ: Lawrence Erlbaum Associates.

Haight, W.L., Black, J.E., & DiMatteo, M.R. (1985). Young children's understanding of the social roles of physician and patient. Journal of Paediatric Psychology, 10, 31-43.

Havermans, T., & Eiser, C. (1994). Siblings of a child with cancer. Child Care, Health, and Development, 20, 309-322.

Jackson, E.B. (1942). Treatment of the young child in the hospital. American Journal of Orthopsychiatry, 12, 56-62.

Jessner, L., Blom, G.E., & Waldfogel, S. (1977). Emotional implications of tonsillectomy and adenoidectomy on children. In R.S. Eissler, A. Freud, M. Kris, & A.J. Solnit (Eds.), An anthology of the psychoanalytic study of the child; Physical illness and handicap in childhood (pp. 15-57). New York: International Universities Press. (Original

work published 1952).

Kavka, J. (1977). Ego synthesis of a life-threatening illness in childhood. In R.S. Eissler, A. Freud, M. Kris, & A.J. Solnit (Eds.), An anthology of the psychoanalytic study of the child; Physical illness and handicap in childhood (pp. 161-178). New York: International Universities Press. (Original work published 1962).

Knox, J.E., & Hayes, V.E. (1983). Hospitalization of a chronically ill child: A stressful time for parents. Issues in Comprehensive Pediatric Nursing, 6, 217-226.

Lewis, M., & Starr, M. (1979). Developmental continuity. In J. Osofsky (Ed.), Handbook of infant development (pp. 653-670). New York: Wiley.

Mabe, P. A., Treiber, F.A., & Riley, W.T. (1991). Examining emotional distress during paediatric hospitalization for school-aged children. Children's Health Care, 20, 162-169.

Marini, Z.A. (1984). The development of social and physical cognition in childhood and adolescence. Unpublished doctoral dissertation. University of Toronto. Ontario Institute for Studies in Education, Toronto.

Marini, Z.A. (1992). Synchrony and asynchrony in the development of children's scientific reasoning. In R. Case (Ed.), The mind's staircase: Exploring the conceptual underpinnings of children's thought and knowledge (pp. 55-73). Hillsdale, NJ: Lawrence Erlbaum Associates.

McKeough, A. (1992a). A neo-structural analysis of children's narrative and its development. In R. Case (Ed.), The mind's staircase: Exploring the conceptual underpinnings of children's thought and knowledge (pp. 171-188). Hillsdale, NJ: Lawrence Erlbaum Associates.

McKeough, A. (1992b). Testing for the presence of a central social structure: Use of the transfer paradigm. In R. Case (Ed.), The mind's staircase: Exploring the conceptual underpinnings of children's thought and knowledge (pp. 207-225). Hillsdale, NJ: Lawrence Erlbaum Associates.

McKeough, A., & Martens, M. (1994). Conceptual change in narrative knowing during childhood and early adolescence. Paper presented at The Learned Societies of Canada Annual Meeting. Calgary, Alberta.

Nelson, K. (1985). Making sense: Development in meaning in early childhood. New York: Academic Press.

Nelson, K. (1986). Event knowledge: Structure and function in development. Hillsdale, NJ: Lawrence Erlbaum Associates.

Nelson, K., & Seidman, S. (1984). Playing with scripts. New York: Academic Press.

Neuhauser, C., Amsterdam, B., Hines, P., & Steward, M.S. Children's concepts of healing: Cognitive development and locus of control factors. American Journal of Orthopsychiatry, 48, 335-341.

Norusis, M.J. (1993). SPSS for Windows: Base systems user's guide. Release 6.0. Chicago: SPSS, Inc.

Olson, A.L., Johansen, S.G., Powers, L.E., Pope, J.B., & Klein, R.B. (1993). Cognitive coping strategies of children with chronic illness. Developmental and Behavioral Pediatrics, 14, 217-223.

Pascual-Leone, J. (1976). A view of cognition from a formalist's perspective. In K.F. Riegel & J. Meacham, (Eds.), The developing individual in a changing world (pp. 89-100). The Hague: Mouton.

Perrin, E.C. (1993). Children in hospitals. Developmental and Behavioral Pediatrics, 14, 50-52.

Perrin, E.C., & Gerrity, P.S. (1981). There's a demon in your belly: Children's understanding of illness. Pediatrics, 67, 841-849.

Perrin, E.C., & Gerrity, P.S. (1984). Development of children with a chronic condition. Pediatric Clinics of North America, 31, 19-31.

Perrin, E.C., Ayoub, C.C., & Willett, J.B. (1993). In the eyes of the beholder: Family and maternal influences on perceptions of adjustment of children with a chronic illness. Developmental and Behavioral Pediatrics, 14, 94-105.

Perrin, E.C., Newacheck, P., Pless, I.B., Drotar, D., Gortmaker, S.L., Leventhal, J., Perrin, J.M., Stein, R.E.K., Walker, D.K., & Weitzman, M. (1993). Issues involved in the definition and classification of chronic health conditions. Pediatrics, 91, 787-793.

Perrin, E.C., & Perrin, J.M. (1983). Clinician's assessment of children's understanding of illness. American Journal of Diseases of Children, 137, 874-878.

Perrin, E.C., Ramsey, B.K., & Sandler, H.M. (1987). Competent kids: children and adolescents with a chronic illness. Child, Care, Health, and Development, 13, 13-32.

Perrin E.C., Sayer, A.G., & Willett J.B. (1991). Sticks and stones may break my bones...Reasoning about illness causality and body functioning in children who have a chronic illness. Pediatrics, 88, 608-619.

Piaget, J. (1929). The child's conception of the world. New York: Harcourt Brace Jovanovich.

Piaget, J. (1960) The child's conception of physical causality. Paterson, NJ.: Littlefield, Adams. (Originally published 1930).

Piaget, J. (1970). Science of education and the psychology of the child. New York: Orion Press.

Porath, M. (1995, June). Children's ideas about intelligence. Paper presented at the Canadian Society for the Study of Education, Montreal.

Potter, P.C. & Roberts, M.C. (1984). Children's perceptions of chronic illness: The roles of disease symptoms, cognitive development, and information. Journal of Paediatric Psychology, 9, 13-27.

Redpath, C.C., & Rogers, C.S. (1984). Healthy young children's concepts of hospitals, medical personnel, operations, and illness. Journal of Paediatric Psychology, 9, 29-40.

Reiss, B.S., & Evans-Mellick, M. (1984). Pharmacological aspects of nursing care. Albany, NY: Delmar Publishers.

Salter, D.J. (1993, June). Interpreting family stories: Narrative meaning constructed throughout adolescence. Paper presented at the Canadian Society for the Study of Education, Ottawa.

Schank, R.C., & Abelson, R. (1977). Scripts, plans, goals, and understanding. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Selman, R.L., & Byrne, D.F. (1974). A structural developmental analysis of levels of role-taking in middle childhood. Child Development, 45, 803-806.

Shagena, M.M., Sandler, H.K., & Perrin, E.C. (1988). Concepts of illness and perception of control in healthy

children in children with chronic illnesses. Developmental and behavioral pediatrics, 9, 252-256.

Siegler, R.S. (1976). Three aspects of cognitive development. Cognitive Psychology, 8, 481-520.

Spelke, E.S. (1988). Where perceiving ends and thinking begins: The apprehension of objects in infancy. In A. Yonas (Ed.), Perceptual development in infancy: Minnesota symposia in child psychology (pp. 197-234). Hillsdale, NJ: Lawrence Erlbaum Associates.

Stein, R.E.K., & Jessop, D.J. (1989). What diagnosis does not tell; The case for a approach to chronic illness in childhood. Social Science in Medicine, 29, 769-778.

Tabachnick, B.G., & Fidell, L.S. (1989). Using multivariate statistics. New York, NY: Harper Collins Publishers.

Thomas, R.B. (1987). Introduction and conceptual framework. In M.H. Rose and R.B. Thomas (Eds.), Children with chronic conditions: Nursing in a family and community context (pp. 3-12). Orlando, Florida: Grune & Stratton, Inc.

Turiel, E. (1983). The development of social knowledge. New York, NY: Cambridge University Press.

Turnbull, A.P., & Rutherford Turnbull, H. (1990) Families, professionals, and exceptionalities: A special partnership. New York, NY: Macmillan Publishing Company.

Vander Veer, A.H. (1949). The psychopathology of physical illness and hospital residence. Quarterly Journal of Child Behaviour, 1, 55-71.

Vernon, D.T.A., Foley, J.M. Sipowicz, R.R., & Schulman, J.L. (1965). The psychological responses of children to hospitalization and illness. A review of the literature. Springfield, IL: Charles C. Thomas Publisher.

Vygotsky, L.S. (1986). Thought and language. Cambridge, MA: MIT Press (Original work published 1934) A. Kozulin, translator...

Walker, C.L. (1993). Sibling bereavement and grief responses. Journal of Pediatric Nursing, 8, 325-334.

Watterson-Wells, P., DeBoard-Burns, M.B., Cook, R.C., & Mitchell, J. (1994). Growing up in the hospital: Part I, let's focus on the child. Journal of Pediatric Nursing, 9, 66-73.

Whaley, L.F., & Wong, D.L. (1991). Nursing care of infants and children. St. Louis, MO: Mosby.

Whitt, J., Dykstra, W., & Taylor, C. (1979). Children's concepts of illness and cognitive development. Clinical Pediatrics, 18, 327-335.

Wilson, E.O. (1975) Sociobiology: The new synthesis. Cambridge, MA: Belknap Press, Harvard University.

Yoos, L. (1987). Chronic childhood illnesses: Developmental issues. Pediatric Nursing, 13, 25-28.



## Appendix A

### American Nurse's Association Standards of Maternal and Child Health Nursing Practice

Standards were obtained from Whaley and Wong (1991, p. 22).

#### Standard I

The nurse helps children and parents attain and maintain optimum health.

#### Standard II

The nurse assists families to achieve and maintain a balance between the personal growth needs of individual family members and optimum family functioning.

#### Standard III

The nurse intervenes with vulnerable clients and families at risk to prevent potential developmental and health problems.

#### Standard IV

The nurse promotes an environment free of hazards to reproduction, growth and development, wellness, and recovery from illness.

Standard V

The nurse detects changes in health status and deviations from optimum development.

Standard VI

The nurse carries out appropriate interventions and treatment to facilitate survival and recovery from illness.

Standard VII

The nurse assists clients and families to understand and cope with developmental and traumatic situations during illness, childbearing, childrearing, and childhood.

Standard VIII

The nurse actively pursues strategies to enhance access to and utilization of adequate health care services.

Standard IX

The nurse improves maternal and child health nursing practice through evaluation of practice, education, and research.

## Appendix B

### Standards for Nursing Practice in British Columbia, Canada

Developed by the Registered Nurses Association of B.C.

#### Standard I

Specialized body of knowledge: Bases practice on nursing science and on related content from other science and humanities. For example, a nurse shares her/his knowledge with clients or others.

#### Standard II

Competent application of knowledge: Diagnoses actual or potential problems and strengths plans interventions, performs planned interventions and evaluates outcomes. For example, a nurse sets priorities when planning and giving care and evaluates client's response to interventions and revises them as necessary.

#### Standard III

Provision of a service to the public: Provides nursing services, coordinates activities and collaborates with others in providing health care services. For example, a nurse explains health care services to clients and others.

#### Standard IV

Code of ethics: Adheres to the ethical standards of the nursing profession.

For example, nurse acts as an advocate to protect and promote a client's right to autonomy, respect, privacy, dignity and access to information.

#### Standard V

Self-Regulation: Assumes primary responsibility for maintaining competence fitness to practice, and acquiring new knowledge and skills.

For example, nurse invests time, effort or other resources in maintaining knowledge and skills required for practice.

#### Standard VI

Responsibility and Accountability: Maintains standards of nursing practice and professional behaviour determined by the Nurses (Registered) Act, RNABC and the practice setting. For example, a nurse is accountable at all times and takes responsibility for own actions.

## Appendix C

### The Nurse's Role Task

The nurse's role task consists of eight drawings that deal with the real-life social experiences a child encounters in hospital. There is boy's and a girl's version. Two drawings represent each category which illustrates the role of the nurse. These categories are nurturance, teaching, caring, and protection. Each story involves a mini-episode in which a nurse interacts with the child in one of the four ways.

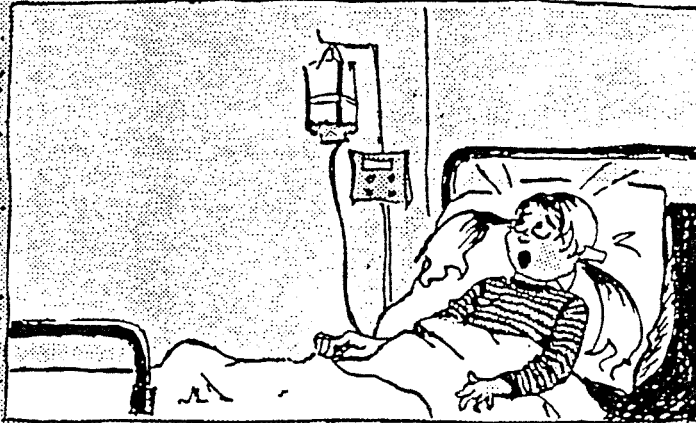
After the child has been told the story by showing the pictures, the following standard questions, adapted from Goldberg-Reitman's (1992) questionnaire, will be asked in the order indicated:

- \* How do you think the little girl/boy feels?
- \* What does the nurse do? Why?
- \* What is the nurse thinking? Why?
- \* How does the nurse feel? Why?
- \* What does the little girl/boy do then? Why?
- \* What is the girl/boy thinking then? Why?
- \* How does the little girl/boy feel then? Why?

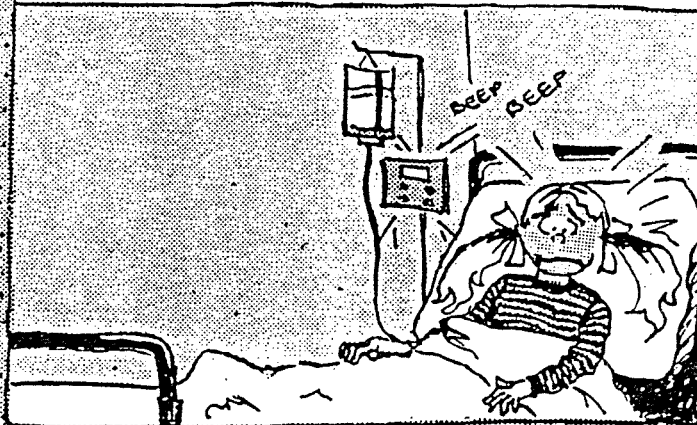
Each story has the same structure and is followed by the same set of questions.

Figure C-1. Graphic representation of Protection stories with a girls' and boys' version (i.e. intravenous bottle and bathroom, respectively).

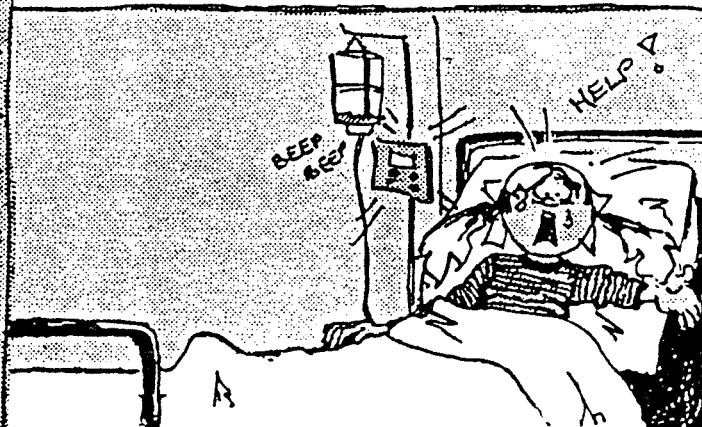
THE LITTLE GIRL'S INTRAVENOUS OR I.V. -  
BOTTLES ARE GETTING EMPTY.



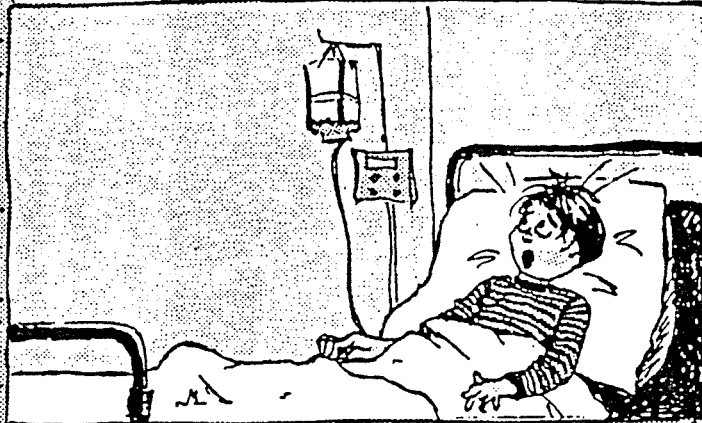
HER MACHINE STARTS TO BEEP.



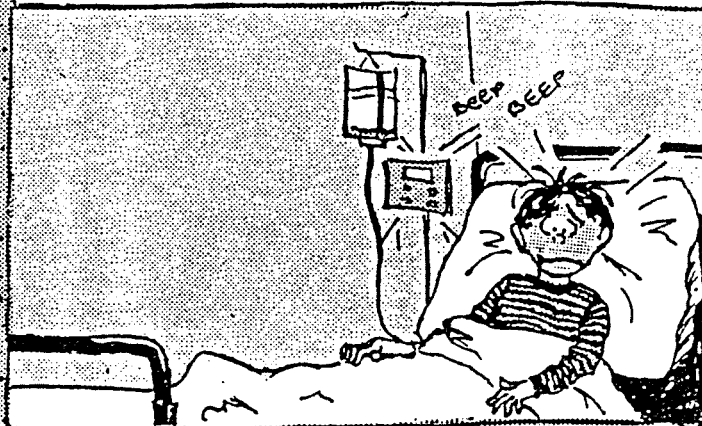
THE LITTLE GIRL STARTS TO PANIC AND  
CALLS FOR "HELP".



THE LITTLE BOY'S INTRAVENOUS OR I.V. -  
BOTTLES ARE GETTING EMPTY.



HIS MACHINE STARTS TO BEEP.

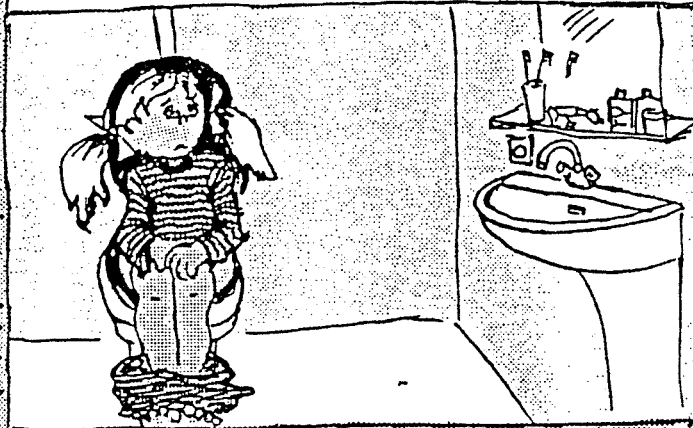


THE LITTLE BOY STARTS TO PANIC AND  
CALLS FOR "HELP."

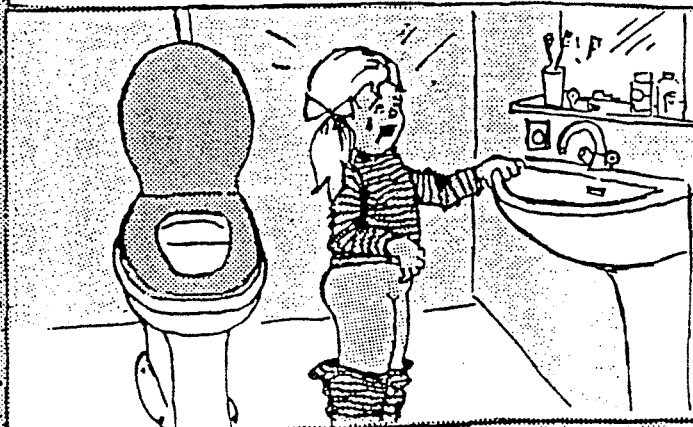




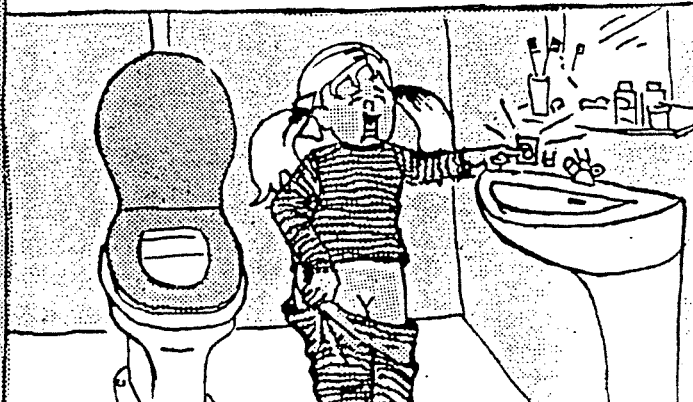
A LITTLE GIRL IS IN THE BATHROOM.



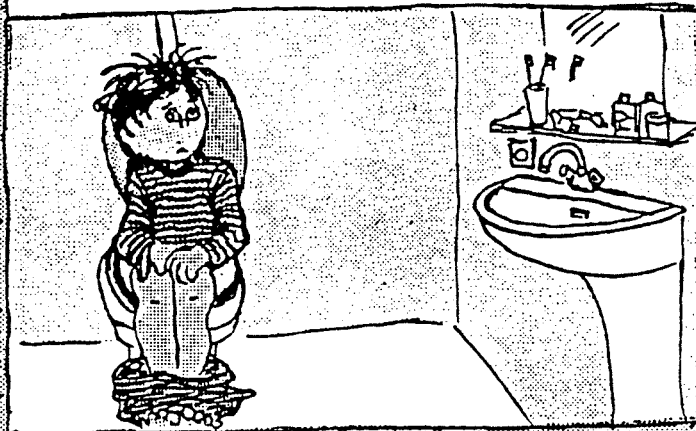
ALL OF A SUDDEN SHE DOESN'T FEEL SO WELL AND WANTS TO <sup>go to</sup> HER BED SOON.



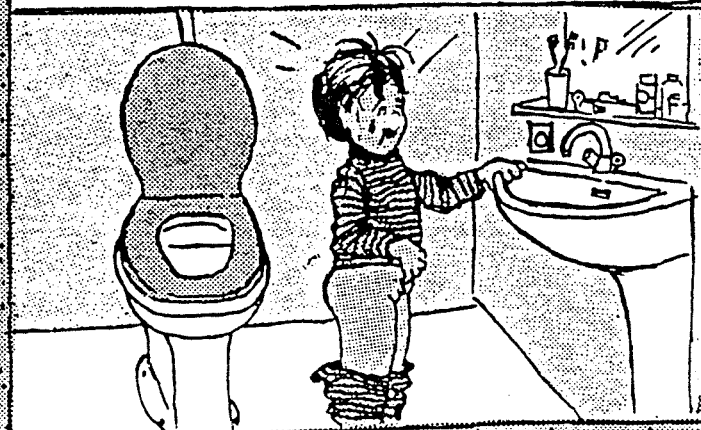
THE LITTLE GIRL PRESSED THE BUTTON AND CRIES FOR HELP.



A LITTLE BOY IS IN THE BATHROOM.



ALL OF A SUDDEN HE DOESN'T FEEL SO WELL AND WANTS TO <sup>GO TO</sup> HIS BED SOON.

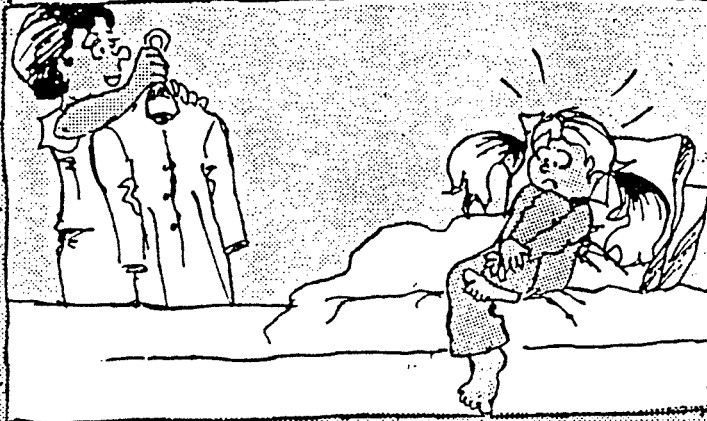


THE LITTLE BOY PRESSES THE BUTTON AND CRIES FOR HELP.



Figure C-2. Graphic representation of Teaching stories with a girls' and boys' version (i.e. hospital gown and hungry and thirsty, respectively).

THE LITTLE GIRL HAS A SMALL OPERATION  
TODAY AND HAS TO WEAR A HOSPITAL GOWN.



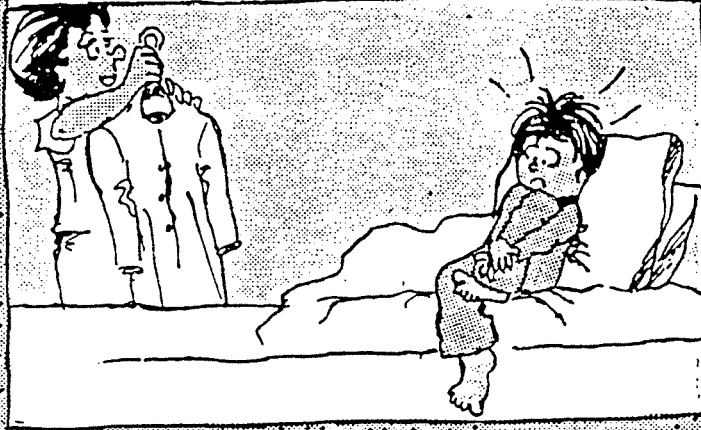
SHE REFUSES, BECAUSE SHE WANTS TO WEAR  
HER OWN PYJAMAS.



SHE IS ANGRY AND STARTS TO CRY.



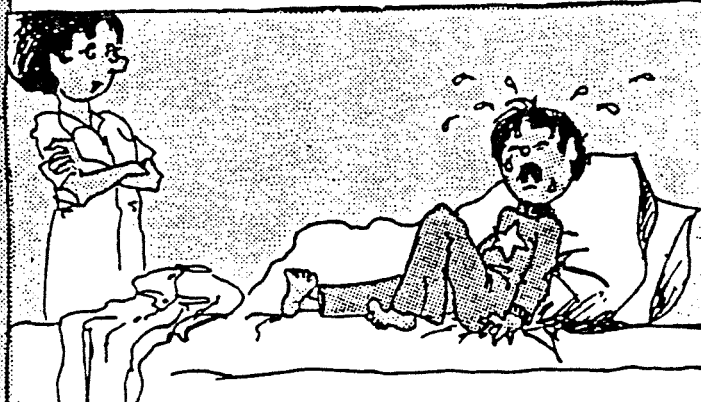
THE LITTLE BOY HAS A SMALL OPERATION,  
TODAY AND HAS TO WEAR A HOSPITAL GOWN.



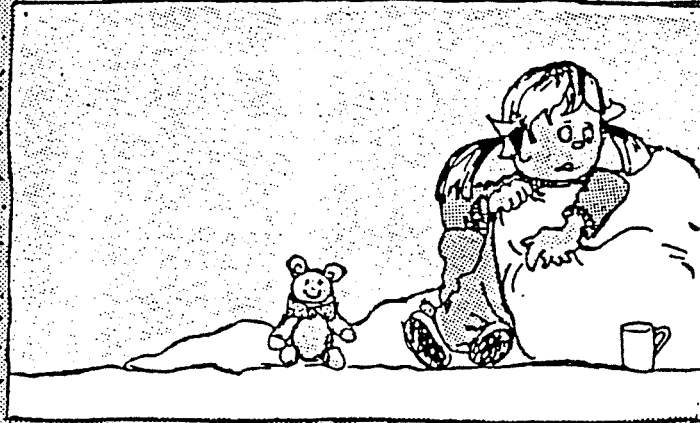
HE REFUSES, BECAUSE HE WANTS TO WEAR  
HIS OWN PYJAMAS..



HE IS ANGRY AND STARTS TO CRY.



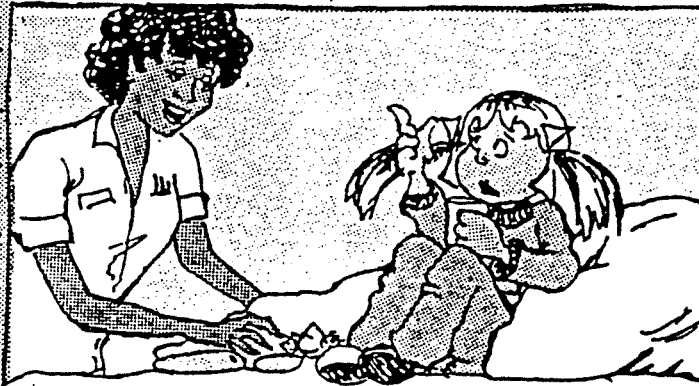
THE LITTLE GIRL WILL HAVE A SPECIAL TEST TODAY AND IS NOT ALLOWED TO DRINK OR EAT ANYTHING.



SHE FEELS HUNGRY AND THIRSTY.

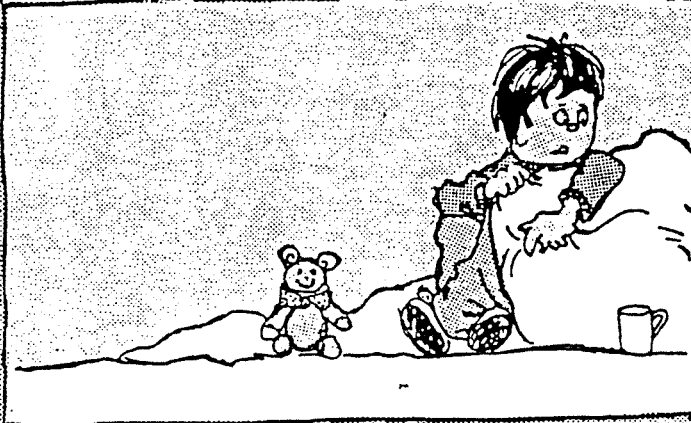


THE LITTLE GIRL SAYS : "I WOULD LIKE TO DRINK SOMETHING."

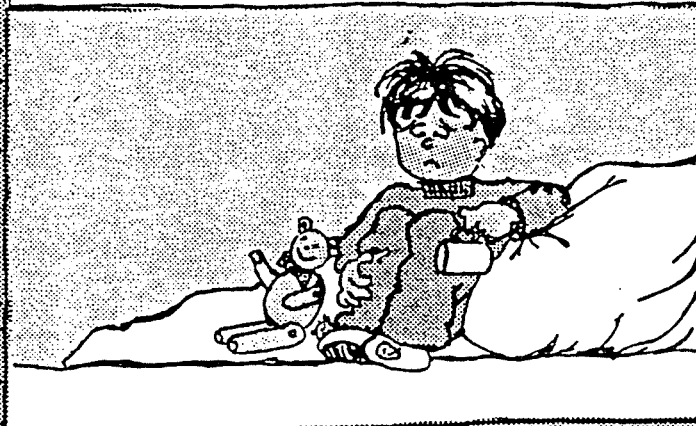




THE LITTLE BOY WILL HAVE A SPECIAL TEST TODAY  
AND IS NOT ALLOWED TO DRINK OR EAT ANYTHING.



HE FEELS HUNGRY AND THIRSTY.



THE LITTLE BOY SAYS: "I WOULD LIKE  
TO DRINK SOMETHING."

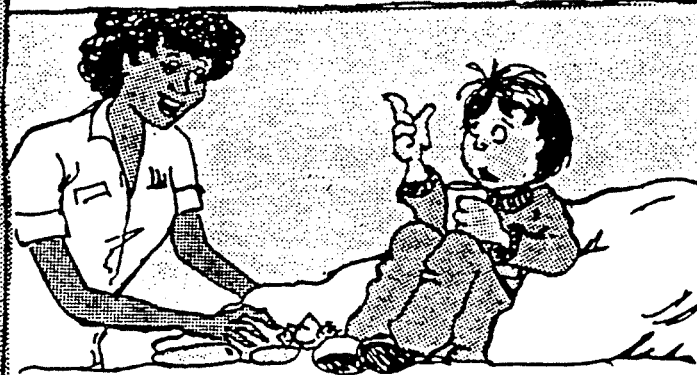


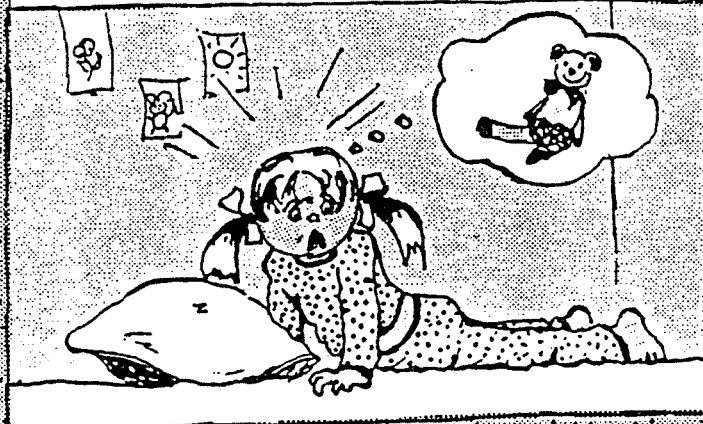
Figure C-3. Graphic representation of Nurturance stories with a girls' and boys' version (i.e., teddy bear and hug, respectively).



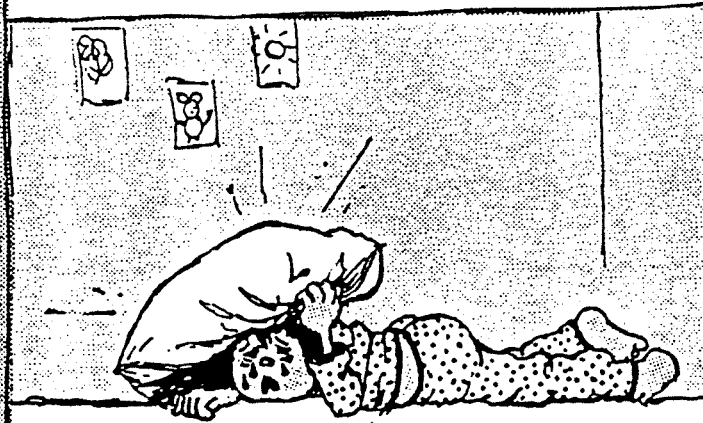
THE LITTLE GIRL'S MUM IS AT THE CAFETERIA.



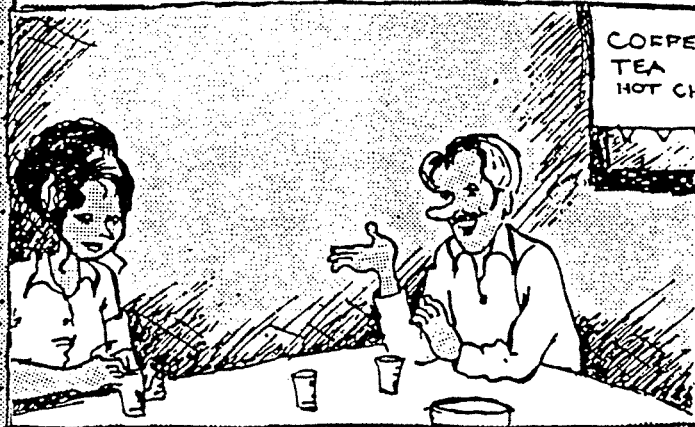
THE LITTLE GIRL DISCOVERS THAT SHE LOST HER FAVOURITE TEDDY - BEAR.



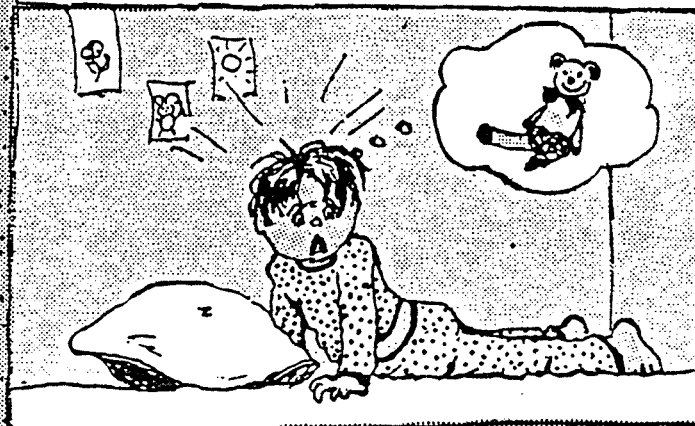
SHE FEELS SAD AND STARTS TO CRY.



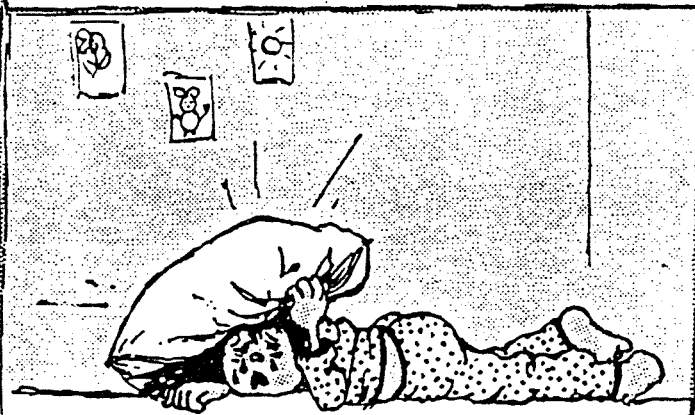
THE LITTLE BOY'S MUM IS AT THE CAFETERIA.



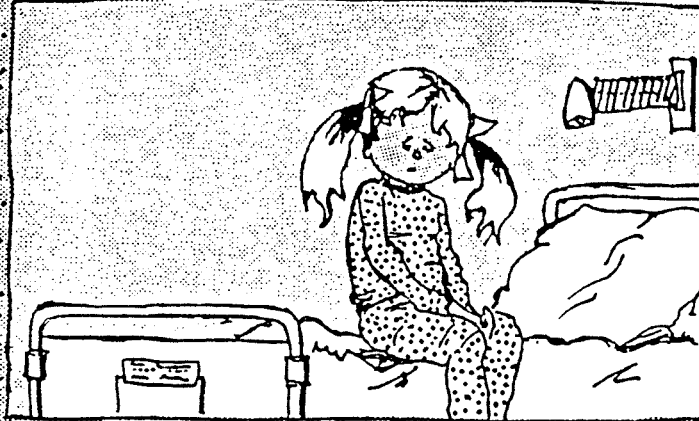
THE LITTLE BOY DISCOVERS THAT HE LOST HIS FAVOURITE TEDDY-BEAR.



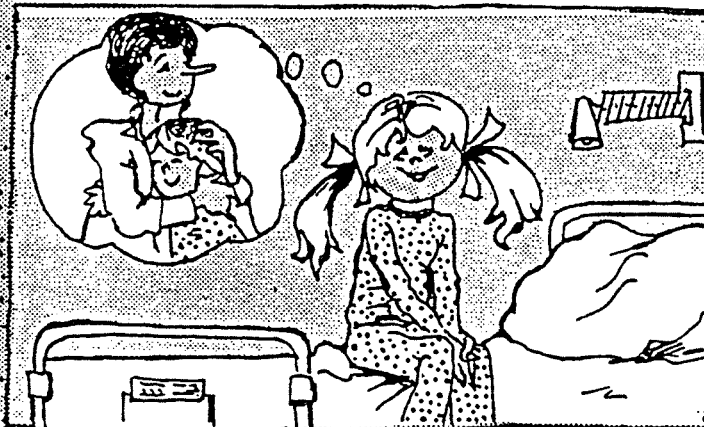
HE FEELS SAD AND STARTS TO CRY.



THE LITTLE GIRL WANTS TO GO TO SLEEP.  
MUMMY IS NOT HERE TONIGHT



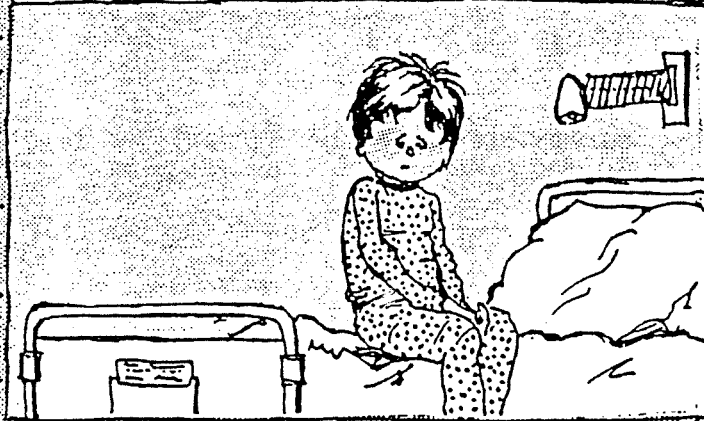
SHE WOULD LIKE TO HAVE A HUG .



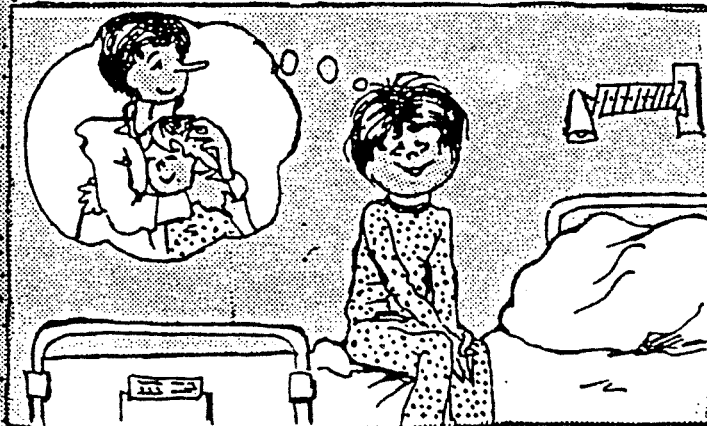
THE LITTLE GIRL CRIES AND DOESN'T  
KNOW WHAT TO DO.



THE LITTLE BOY WANTS TO GO TO SLEEP.  
MUMMY IS NOT HERE TONIGHT.



HE WOULD LIKE TO HAVE A HUG.



THE LITTLE BOY CRIES AND DOESN'T  
KNOW WHAT TO DO.

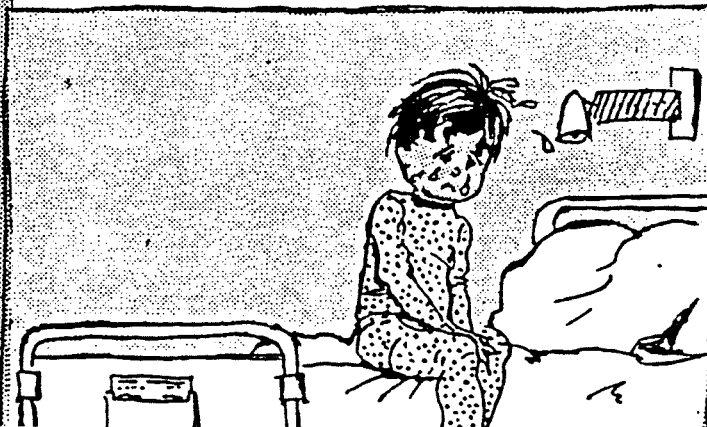
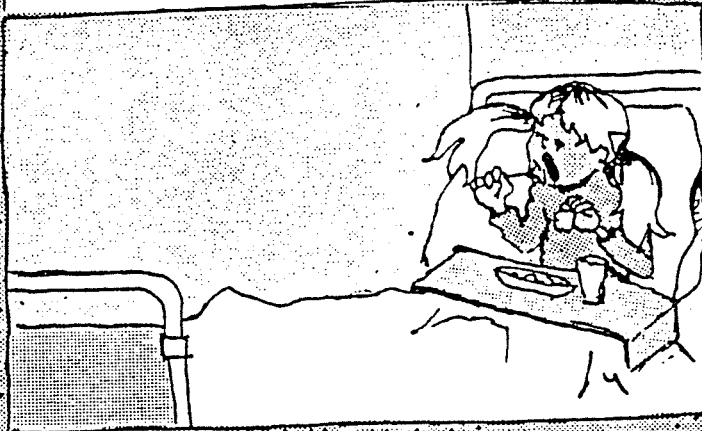
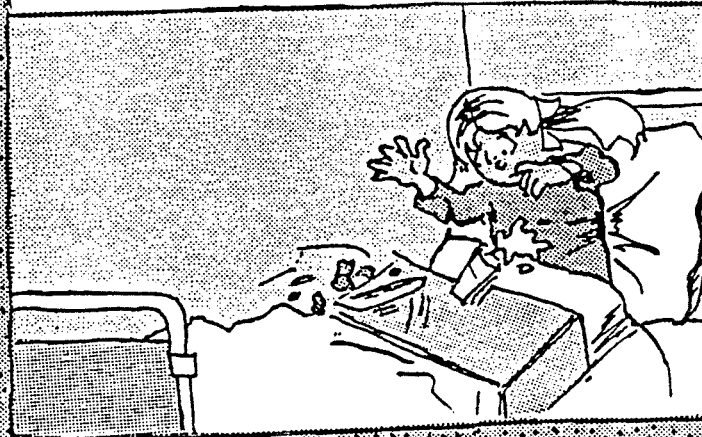


Figure C-4. Graphic representation of Care stories with a girls' and boys' version (i.e., yucky and gucky and blanket, respectively)

THE LITTLE GIRL SITS ON HER BED AND EATS  
HER DINNER.



SHE TURNS AROUND AND HER FOOD FALLS OFF  
HER PLATE ONTO HER BED.

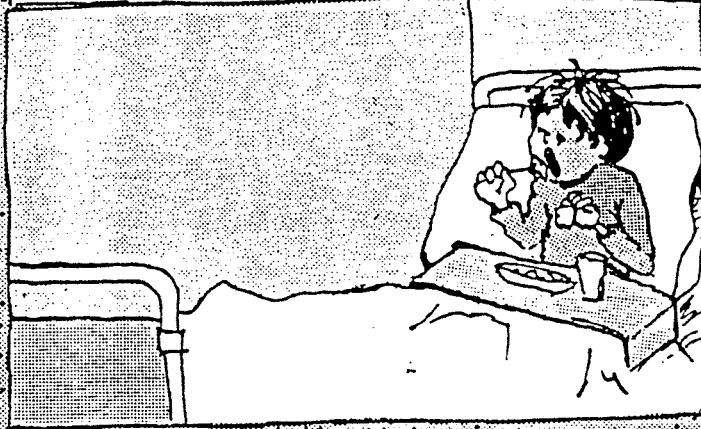


THE LITTLE GIRL SAYS : " I FEEL YUCKY  
AND GUCKY."

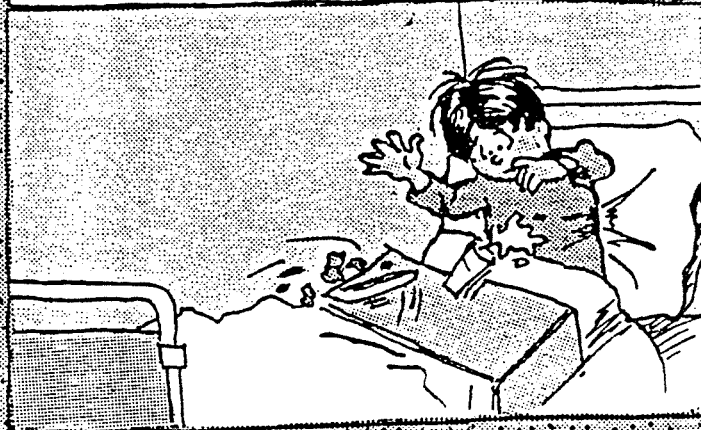




THE LITTLE BOY SITS ON HIS BED AND  
EATS HIS DINNER.



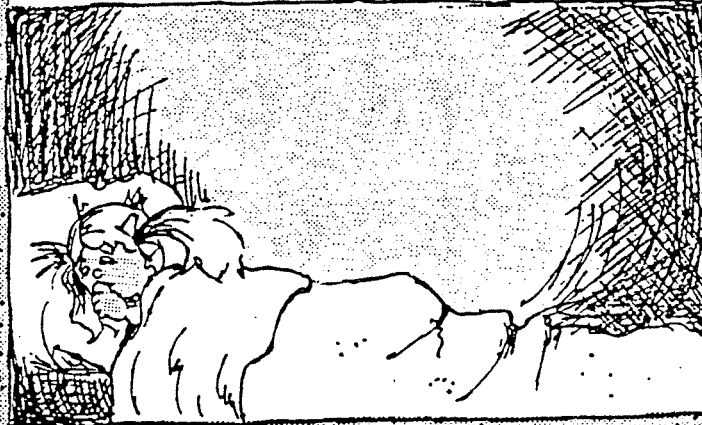
HE TURNS AROUND AND HIS FOOD FALLS  
OFF HIS PLATE ONTO HIS BED.



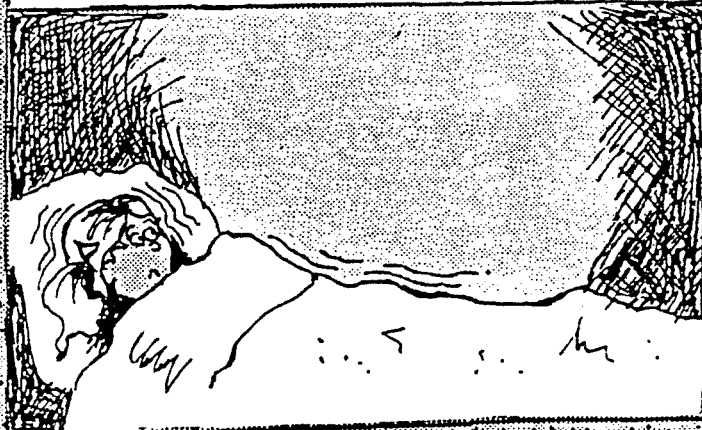
THE LITTLE BOY SAYS : "I FEEL YUCKY  
AND GUCKY."



THE LITTLE GIRL LIES IN BED AND WANTS,  
TO SLEEP.



SHE FEELS COLO AND STARTS TO SHIVER.

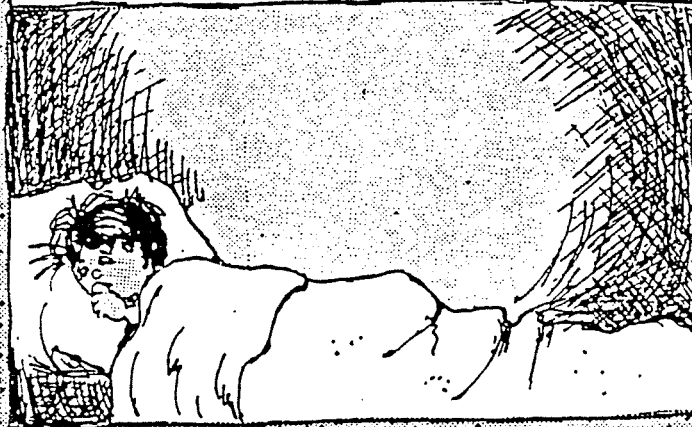


THE LITTLE GIRL WOULD LIKE AN EXTRA  
BLANKET AND CRIES OUT FOR HELP.





THE LITTLE BOY LIES IN BED AND WANTS  
TO SLEEP.



HE FEELS COLD AND STARTS TO SHIVER.



THE LITTLE BOY WOULD LIKE AN EXTRA  
BLANKET AND CRIES OUT FOR HELP.



## Appendix D

### Procedures for Solving the Balance Beam Task

#### 4 YRS (predimensional strategy):

Classify Side A w/r\* Weight  
Classify Side B w/r Weight  
If A (or B) Big w/r Weight  
And Other Side Not,  
Predict That A or B Will Go Down (or vice versa)  
(otherwise Guess)

#### 6 YRS (unidimensional strategy):

Count Weights on Side A — QWeight (A)  
Count Weights on Side B — QWeight (B)  
Compare Magnitude  
If QWeight (A) > QWeight (B) (or vice versa)  
Predict That (A) Will Go Down (or vice versa)  
(otherwise predict "balance")

#### 8 YRS (bidimensional strategy):

Count Weights on Side A — QWeight (A)  
Count Weights on Side B — QWeight (B)  
Compare Magnitude .Store.  
Count Distance on Side A — QDistance (A)  
Count Distance on Side B — QDistance (B)  
If QWeight (A) ~ QWeight (B)  
And QDistance (A) > QDistance (B) (or vice versa)  
Predict That A Will Go Down (or vice versa)  
(otherwise proceed as at 6)

#### 10 YRS (integrated bidimensional strategy):

Count Weights on Side A — QWeight (A)  
Count Weights on Side B — QWeight (B)  
Compute Different .Store. — QDiff (weight)  
Count Distance on Side A — QDistance (A)  
Count Distance on Side B — QDistance (B)  
Compute Difference .Store. — QDiff (distance)  
If QDiff (weight) > QDiff (distance)  
  
Predict Side with Greater Weight Will Go Down  
If QDiff (distance) > QDiff (weight)  
  
Predict Side with Greater Distance Will Go Down  
(otherwise predict balance)  
\*w/r = with regard to

Figure D-1. Procedures used by children at different ages for solving the balance beam task (Case, 1992, p.94).

## Appendix E

### The Dimensional Balance Beam Task

The test instrument of the balance beam task contains a wooden balance scale and ten metal washers. The arms of the balance beam are supported by two upholders to prevent them from going up and down. The total length of the arm is 32" and has four pegs on each side of the fulcrum. The distance between the four pegs on each side of the fulcrum is 3 in. Subsequently, the distance between the two closest pegs from the fulcrum is 6 in., 3 in. on either side.

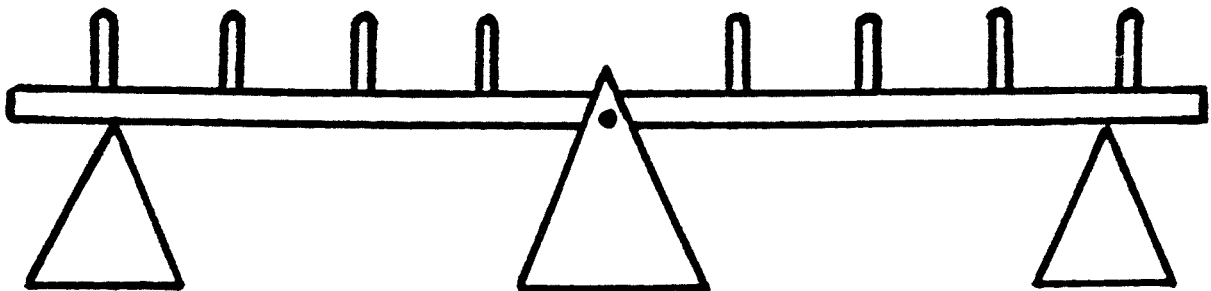
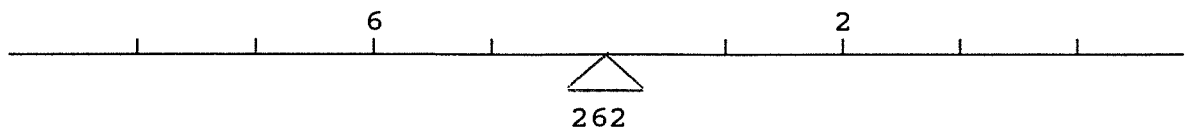


Figure E-1. The dimensional balance beam instrument

#### Dimensional balance beam tasks

The balance beam tasks are described as follows. The subjects have to evaluate and coordinate the differences in weight and distance in order to solve the problems.

1. Substage 0 - Operational Consolidation

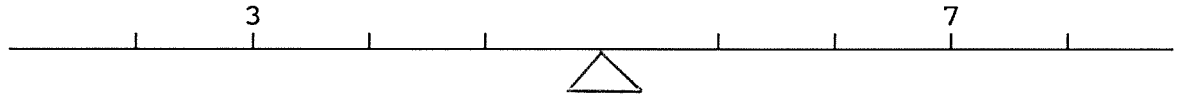


Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

2.



Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

3.

Substage 1 - Unifocal Coordination



Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

4.



Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

5.

Substage 2 - Bifocal Coordination



Prediction \_\_\_\_\_

Why? \_\_\_\_\_  
\_\_\_\_\_

6.



Prediction \_\_\_\_\_

Why? \_\_\_\_\_  
\_\_\_\_\_

7.

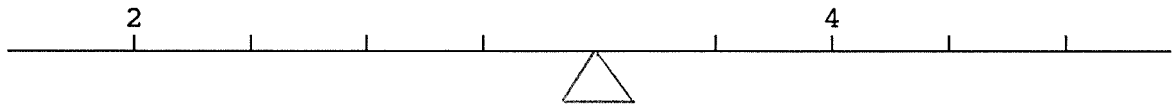
Substage 3 - Elaborated Coordination



Prediction \_\_\_\_\_

Why? \_\_\_\_\_  
\_\_\_\_\_

8.



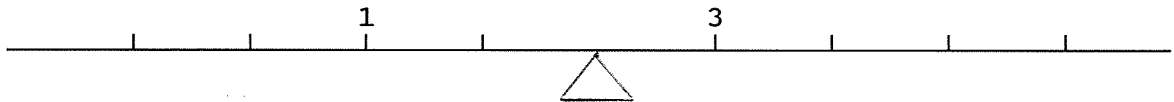
Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

9.

Substage 1 - Vectorial-Unifocal Coordination

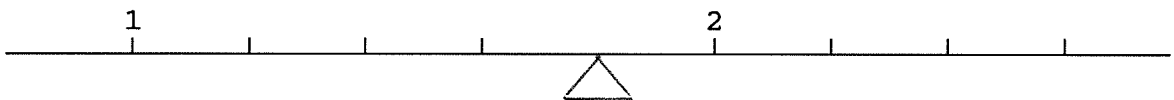


Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

10.



Prediction \_\_\_\_\_

Why? \_\_\_\_\_

\_\_\_\_\_

## Appendix F

### Task of Intrapersonal Understanding

#### I. HAPPY

What does it mean to be happy?

What else can it mean?

What is happening when your are happy?

When you are happy doing------(child's example), where does the happiness come from?

## II. SAD

What does it mean to be sad?

What else can it mean?

What is happening when you are sad?

When you are sad doing----- (child's example), where  
does the sadness come from?

## III. GOOD

What does it mean to be good?



What else can it mean?

What is happening when you are good?

When you are good doing----- (child's example), where  
does the goodness come from?

#### IV. BAD

What does it mean to be bad?

What else can it mean?

What is happening when you are bad?

When you are bad doing----- (child's example), where does the badness come from?

## Appendix G

Letter of Information to All Physicians of  
British Columbia's Children's Hospital.

# THE UNIVERSITY OF BRITISH COLUMBIA



## Department of Educational Psychology and Special Education

Faculty of Education

2125 Main Mall

Vancouver, B.C. Canada V6T 1Z4

Tel: (604) 822-8229

Fax: (604) 822-3302

- / - / 1994

Dear Physician,

I would like to inform you about my study of hospitalized children's understanding of the nurse's role. This study is being conducted in B.C.'s Children's Hospital for my doctoral research in Educational Psychology and Special Education at the University of British Columbia. The study has as its focus the ways in which children of different ages understand what a nurse does for the child when he/she is in hospital. This study will be useful in improving and facilitating the explanations to children of services currently offered by nurses (e.g., medical treatments and daily care). This study has been approved by both the U.B.C.'s Ethical Review Committee and the BCCH In-Hospital Review Committee.

Forty children (10 each at four age levels; 4,6,8, and 10 years old) with various chronic conditions will be selected by using the nursing kardex or nurse and/or parent report and appropriate consultation of nursing staff. Children will be excluded from participation in the study if their life is threatened, if it is their first in-patient admission, if they are emotionally disturbed, or if they have a neurological deficit. Children that are selected will be asked to complete three easy-to-do tasks that children usually find fun. Tasks will be given during sessions of half an hour each at the child's bedside in his/her hospital room. The tasks are usually beneficial to children because they are temporarily distracted from hospitalization, treatments, etc. If signs of fatigue are observed by the researcher and/or mentioned by the child the session will be postponed or discontinued. Parents are allowed to be present during the research if it makes the child feel more comfortable. All the data will be collected by myself. I have a master's degree in Clinical Pedagogics and have experience with working with children with chronic conditions.

If one of your patients has been selected for this research and both the child's parents and the child him/herself have agreed to cooperate, you will be notified. Should you have any questions or concerns, either I or my

dissertation supervisor would be pleased to discuss them with you (Els Eikelhof, 222-8164; Dr. Marion Porath, 822-6045). Thank you very much for your interest and cooperation.

Sincerely,

Eikelhof, MA

## Appendix H

### Letter of Notification for Nurses on Six Hospital Units

# THE UNIVERSITY OF BRITISH COLUMBIA



## Department of Educational Psychology and Special Education

Faculty of Education

2125 Main Mall

Vancouver, B.C. Canada V6T 1Z4

Tel: (604) 822-8229

Fax: (604) 822-3302

- / - / 1994

Dear Nurse,

I am a doctoral candidate in Educational Psychology and Special Education at the University of British Columbia. I am doing a study on hospitalized children's understanding of the nurse's role and would like to ask for your assistance with this study. The study has as its focus the ways in which children of different ages understand what a nurse does for the child when he/she is in hospital. This study will help nurses to improve and facilitate their explanations to children of the services they offer (e.g., medical treatments and daily care).

Forty children (10 each at four age levels; 4,6,8, and 10 years old) with chronic conditions will be selected by using the nursing kardex. Children that are selected will be asked to complete three easy-to-do tasks. Children usually enjoy these tasks very much because they are temporarily distracted and are able to express themselves about their hospital stay in a non-threatening way. Tasks will be given during three sessions of half an hour each at the child's bedside in his/her hospital room. If signs of fatigue are observed by the researcher and/or mentioned by the child the session will be postponed or discontinued. Parents are allowed to be present during the sessions if it makes the child feel more comfortable.

I would like to ask you to give a letter to the parents of each selected child. In this letter parents will be asked whether they do or do not want to be contacted in relation to this study. This way the privacy of the parents and the child will be respected. If they agree to be contacted I will then approach them in person and ask for their consent. Please indicate in the space below if you do or do not want to cooperate with this study and return this form to me as soon as possible. If you have any questions do not hesitate to contact me (tel: 222-8164) or my dissertation supervisor (Dr. Marion Porath, tel:822-6045).

I, \_\_\_\_\_ would like to  
cooperate in this research and am willing to contact the

parents of selected children in relation to this study.

YES \_\_\_\_\_

NO \_\_\_\_\_

Thank you very much for your interest and cooperation.

Sincerely,

Els Eikelhof, MA.



## Appendix I

### Parental Contact Form

# THE UNIVERSITY OF BRITISH COLUMBIA



## Department of Educational Psychology and Special Education

Faculty of Education

2125 Main Mall

Vancouver, B.C. Canada V6T 1Z4

Tel: (604) 822-8229

Fax: (604) 822-3302

- / - / 1994

Dear Parent,

Els Eikelhof is a doctoral candidate in Educational Psychology and Special Education at the University of British Columbia. She is doing a study on hospitalized children's understanding of the nurse's role and would like to contact you regarding this study. Her study has as its focus the ways in which children of different ages understand what a nurse does for them when they are hospitalized. This study will help nurses to improve and facilitate their explanations to children of the services they offer (e.g., daily care and medical treatments). Therefore, your child is asked to participate in the study.

If you and your child agree to take part in the study, your child will be given three easy-to-do tasks. Children usually enjoy these tasks very much because they are temporarily distracted and are able to express themselves about their hospital stay in a non-threatening way.

Your assistance with this study would be greatly appreciated. Please indicate in the space below whether you do or do not want to be contacted in relation to this study and return this form to the nurse's station within three days. Should you have any questions before that time, please do not hesitate to contact Els (tel: 263-4342) or her dissertation supervisor (Dr. Marion Porath, 822-6045). Thank you very much for your interest and cooperation.

I, \_\_\_\_\_ parent or guardian of

\_\_\_\_\_ would like to receive more information about this study and am willing to be contacted by Els Eikelhof.

YES \_\_\_\_\_

NO \_\_\_\_\_

## Appendix J

### Wording of How Parents Were Approached Including Introduction of Research and Requesting Consent.

"Hello, my name is Els Eikelhof and I would like to ask for your child's participation in my research. I am a doctoral student in Educational Psychology and Special Education at UBC. I am looking at how children of different ages understand the role of the nurse. The reason why I want to examine the role of the nurse is because I would like to get more information about how a hospitalized child with a chronic condition understands what a nurse does for him/her in the hospital. This information can then be used to improve the communication between the nurse and the child. For children that have to be hospitalized often because of their illness, it is especially important for the nurse to know how, for example, a four-year-old child looks at him/her. This better understanding can improve medical treatments and daily care done by the nurse. I would like to give you a letter of consent, so that you can think about whether you would like your child to participate in this research or not. If you approve, I would like to see your child three times for about half an hour each time to give three tasks that are fun to do. If you are interested, I can show you these tasks and explain what they examine. If you want to, you can also be present during the assessments of your child if you think it will be more comfortable for him/her. If you have any questions about the tasks, I will be willing to answer them after I have finished doing them with your child. Here is the form that asks for permission for your child's participation. Can you bring the completed form back to the nurses' station as soon as possible? Thank you for your time and interest and I hope to see you and your child again."

## Appendix K

### Wording of How Children Were Approached to Ask Their Participation in the Study.

"Hello, my name is Els. I am writing a book about how children think about what a nurse does for them when they are in the hospital and I would like you to help me with my book. The reason why I want you to help me is because I would like to know how a child of your age thinks about certain things that happen in the hospital and what you think the nurse will do when these things happen. If the nurse knows how a child of your age thinks about her/him, it will make her/him working with you easier because she/he understands you a lot better. I have three nice tasks for you to do. I will come to you three times for a short time. If you are too tired or don't feel too good, please tell me and I will come back another time. If you don't feel like helping me any more, please tell me that too. Then we will just stop. So do you think you want to help me with my book?"

## Appendix L

### Parental Consent Form

# THE UNIVERSITY OF BRITISH COLUMBIA



## Department of Educational Psychology and Special Education

Faculty of Education

2125 Main Mall

Vancouver, B.C. Canada V6T 1Z4

Tel: (604) 822-8229

Fax: (604) 822-3302

- / - / 1994

Dear Parent,

I am doing a study of hospitalized children's understanding of the nurse's role. This study is being conducted for my doctoral research in Educational Psychology and Special Education at the University of British Columbia. The study has as its focus the ways in which children of different ages understand what a nurse does for the child when he/she is in hospital. This study will be useful in improving and facilitating the explanations to children of services currently offered by nurses (e.g., medical treatments and daily care).

Children will be asked to complete three easy-to-do tasks. Children usually enjoy these tasks very much because they are temporarily distracted and are able to express themselves about their hospital stay in a non-threatening way. One task will focus on the child's level of understanding of the nurse's role. Your child will be shown a set of pictures that deal with real-life social interactions a child experiences in hospital. The second task will concentrate on how your child will solve problems that involve weights on a balance scale. In the third task your child will be asked the meanings of happy, sad, good, and bad in a short interview. Tasks will be given during three sessions of half an hour each at the child's bedside in his/her hospital room.

All of the data will be coded by number to ensure confidentiality. Your child may withdraw from the study at any time if he/she wishes. Refusal to participate will not jeopardize medical treatment. If signs of fatigue are observed by the researcher and/or mentioned by the child the session will be postponed or discontinued. All the data will be collected by myself. I have a master's degree in Clinical Pedagogics and have experience in working with children with chronic conditions.

I would greatly appreciate your assistance with this study. Please sign this letter in the space below indicating whether you do or do not agree to let your child participate

and return this form to the nurse's station as soon as possible. Please also sign and retain a second copy for your own records. Should you have any questions, either I or my dissertation supervisor would be pleased to discuss them with you (Els Eikelhof, 263-4342; Dr. Marion Porath, 822-6045). Thank you very much for your interest and cooperation.

Sincerely,

Els Eikelhof, MA.

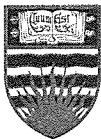
I, \_\_\_\_\_ parent or guardian of \_\_\_\_\_  
\_\_\_\_\_ do \_\_\_\_\_ do not consent to allow my child to participate  
in the study described above. I acknowledge that I have  
received a copy of this consent form.  
Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Appendix M

### Letter of Notification Given to Physicians Whose Patient Participated in the Study



# THE UNIVERSITY OF BRITISH COLUMBIA



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- / - / 1994

Dear Dr.

I would like to inform you of the participation of your patient (patient's name) in my study. Both the child's parents and the child him/herself have agreed to cooperate. I am doing a study on hospitalized children's understanding of the nurse's role. This study is being conducted for my doctoral research in Educational Psychology and Special Education at the University of British Columbia. The study has as its focus the ways in which children of different ages understand what a nurse does for the child when he/she is in hospital. This study will help nurses to improve and facilitate their explanations to children of the services they offer (e.g., medical treatments and daily care).

Forty children (10 each at four age levels; 4,6,8, and 10 years old) with chronic conditions will be selected by using the nursing kardex. Children that are selected will be asked to complete three easy-to-do tasks. Children usually enjoy these tasks very much because they are temporarily distracted and are able to express themselves about their hospital stay in a non-threatening way. Tasks will be given during three sessions of half an hour each at the child's bedside in his/her hospital room. If signs of fatigue are observed by the researcher and/or mentioned by the child the session will be postponed or discontinued. Parents are allowed to be present during the sessions if it makes the child feel more comfortable.

Should you have any questions, either I or my dissertation supervisor would be pleased to discuss them with you (Els Eikelhof, 263-4342; Dr. Marion Porath, 822-6045). Thank you very much for your interest and cooperation.

Sincerely,

Els Eikelhof, MA.

## Appendix N

### Box and Whisker Plots

Information about how to interpret Figures 5 and 6 (p. 144, and p. 151, respectively). These two figures are called box and whisker plots and can be explained as follows (see Figure N-1):

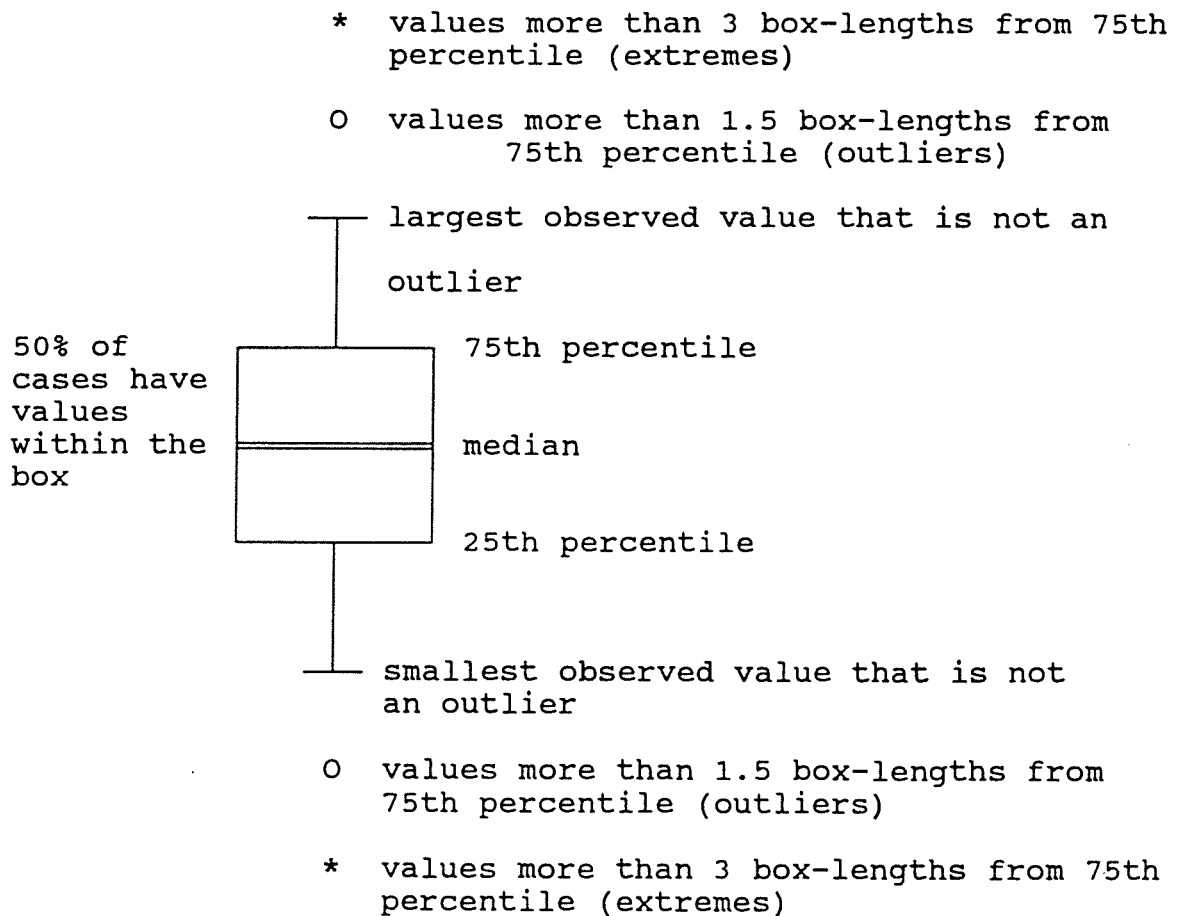


Figure N-1. Explanation of how to interpret a box and whisker plot (Norusis, 1993, p. 186).