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Abstract

Consistency of Self-Report
in School Age Children with Asthma

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There is increasing use of self-report for data collection in research of children and their health related concepts. From a developmental perspective, it is assumed that children can be accurate historians after age 8 years. Despite this trend and assumption, few studies have explicitly examined either the extent to which children are capable of consistent self-report or the age at which this occurs. Yet, without accuracy and consistency, child self-report is a relatively futile approach to use when assessing or evaluating interventions.

This study examined the consistency of self-report among 45 children age 8-12 years with asthma. Consistency contains two aspects: consistency across time or longitudinal consistency and consistency between two measures of the same concepts at the same point in time. The purpose of this study was to answer the following questions: Is there consistency in the children's self-report regarding important asthma management issues over a 3 month time frame? Is there consistency in the children's self-report of what they feel is important between two rating methods (rank order and weighting) at the same point in time? And, does the level of

consistency across time and measures differ by experimental versus control group? It was expected that children in this age group would be consistent both longitudinally and between measures and that no significant differences would be found between experimental and control group.

Secondary analysis of data from a larger study were analyzed. An instrument entitled, "How Important Is It?" was used to measure the personal saliency of 6 asthma management concepts: prevention, intervention during an asthma attack, feeling good about themselves, medication usage, being active and not being different from peers. Children were first asked to rank order the 6 concepts in order of importance. They were next asked to weight the importance of the same 6 concepts using a poker chip method. Data was collected at 3 months and again at 6 months after the original study intervention took place.

Item level analysis suggests that each of the 6 concepts studied were important to some children. Longitudinal consistency data revealed consistency with only 1 out of 6 concepts with rank ordering (17%) and consistency with 4 out of 6 concepts with weighting by number of chips (67%). Between measure consistency analysis revealed consistency with 4 out of 6 concepts at 3 months (67%) and 3 out of 6 concepts at 6 months (50%). A significance level of .05 was used as the critical level for statistical significance. Repeated measures analysis of variance revealed no statistically significant differences between experimental and control group.

This study revealed less consistency than was expected, particularly with longitudinal rank ordering. Results suggest that the

children may have had difficulty with rank ordering. If so, this would also decrease between measure consistency. Results indicate that developmentally this group of children age 8-12 years were not capable of consistent self-report using rank ordering and were only consistent 67% of the time when using weighting by number of poker chips. Despite concerns about rank ordering, these children did demonstrate partial consistency, both between measures and longitudinally using weighting by number of poker chips, thus indicating that they were capable of some aspects of self-report.

References

Abu-Saad, H. & Holzemer, W. (1981). Measuring children's self-assessment of pain. Issues in Comprehensive Pediatric Nursing, 5, 337-349.

Abu-Saad, H. (1984). Assessing children's responses to pain. Pain, 19, 163-171.

Baranowski, T. (1985). Methodologic issues in self-report of health behavior. Journal of School Health, 55(5), 179-182.

Bibace, R. & Walsh, M. E. (1980). Development of children's concepts of illness. Pediatrics, 66(6), 912-917.

Carrieri, V. K., Kieckhefer, G., Janson-Bjerklie, S. & Souza, J. (1991). The sensation of pulmonary dyspnea in school-age children. Nursing Research, 40(2), 81-85.

Castaneda, A., Boyd, R., & Palermo, D. (1956). The children's form of the manifest anxiety scale. Child Development, 27(3), 317-325.

Clatworthy, S.M. (1978). The effect of therapeutic play on the anxiety behaviors of hospitalized children. (Doctoral dissertation, Boston University School of Education, 1978). Dissertation Abstracts International, 38, 6142B.

Erickson, C. J. (1990). Pain measurement in children: problems and directions. Developmental and Behavioral Pediatrics, 11(3), 135-137.

Harter, S. (1982). The perceived competence scale for children. Child Development, 53, 87-97.

Hester, N. K. (1979). The preoperational child's reaction to immunization. Nursing Research, 28(4), 250-254.

Hester, N. (1984). Child's health self-concept scale: its development and psychometric properties. Advances in Nursing Science, 45-55.

Johnson, J. E., Kirchhoff, K. T. & Endress, M. P. (1975). Altering children's distress behavior during orthopedic cast removal. Nursing Research, 24(6), 404-410.

Kieckhefer, G. M. (1986). Impact of an active communication intervention with school-age children with asthma. Unpublished manuscript.

Kovacs, M. (1981). Rating scales to assess depression in school-aged children. Acta Paedopsychiat, 46, 305-315.

Lehmann, H. P., Bendebba, M. & DeAngelis, C. (1990). The consistency of young children's assessment of remembered painful events. Developmental and Behavioral Pediatrics, 11(3), 128-134.

Lewis, C. C., Pantell, R. H. & Kieckhefer, G. M. (1989). Assessment of children's health status: field test of new approaches. Medical Care, 27, S54-S65.

Perrin, E. C. & Gerrity, P. S. (1981). There's a demon in your belly: children's understanding of illness. Pediatrics, 67, 841-849.

Piaget, J. & Inhelder, B. (1969). The Psychology of the Child. New York: Basic Books.

Reynolds, C. R. & Richmond, B. O. (1979). Factor structure and construct validity of "what I think and feel": the revised children's manifest anxiety scale. Journal of Personality Assessment, 43(3), 281-283

Taylor, J. A. (1953). A personality scale of manifest anxiety. Journal of Abnormal Social Psychology, 41, 81-89.

Tiedeman, M. E. & Clatworthy, S. (1990). Anxiety responses of 5- to 11- year-old children during and after hospitalization. Journal of Pediatric Nursing, 5(5), 334-343.

Tsigounis, S. A. (1978). The relationship between parent-child perceptions of hospitalization and the child's subsequent psychological response. (Doctoral Dissertation, California School of Professional Psychology, 1977). Dissertation Abstracts International, 38, 3915B.

Webster's Ninth New Collegiate Dictionary. (1989). Springfield, MA: Merriam-Webster.

Consistency of Self-Report

in School Age Children with Asthma

by

Barbara Jean Heiller

A thesis submitted in partial fulfillment
of the requirements for the degree of

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Chapter 1
INTRODUCTION

Research with children is complicated by methodological concerns that are not present in adult research. These concerns stem from a variety of factors which include cognitive functioning and developmental stage of the child, limited prior experience with illness or the health care system and the effects of parental attitudes. Traditionally, research with children has relied primarily on parental or other adult report. Children were not seen as accurate reporters. However, some studies are now questioning the enhanced accuracy of parental report (Baranowski, 1985, Clatworthy, 1978, Tsigounis, 1977).

Reliance only on parental report is changing. Self-report is becoming more important in collecting accurate data about children and their health related concepts. The growing acceptance of youngster's views as valid information is evidenced by emerging use of self-report to study a number of health concepts. These concepts include health self-concept (Hester, 1984), competence (Harter, 1982), pain (Abu-Saad, 1981, 1984; Lehmann, Bendebba & DeAngelis, 1990; Hester, 1979), anxiety (Castaneda, 1956; Tiedeman & Clatworthy,1990), dysprea (Carrieri, Kieckhefer, Janson-Bjerklie & Souza, 1991), depression (Kovacs, 1981) and exercise/diet pattern (Baranowski, 1985).

In spite of this trend toward accepting child self-report, few studies have looked at the accuracy or consistency of self-report in children. Based on developmental stage theory and related research,

it is assumed that children can be accurate historians at around age 8 (Harter, 1982). Yet again, few studies empirically examine the extent to which this is seen in their samples. In research studies using self-report, minimal test-retest sampling is reported. When done, retest samples are small in comparison to original studies, time periods between test-retest range from less than one week to nine months with no conceptual reason for the time frame used and few longitudinal studies go beyond two time periods. Yet without accuracy and consistency, child self-report is a relatively futile approach for nurses to use when assessing or evaluating nursing interventions.

One suggestion for approaching further research in this area emerged from the pain research. Erickson (1990) found a lack of reliable and valid methods of measuring the pain experienced by children. Factors Erickson theorized contributed to this problem included the subjective nature of pain, variable intensity of pain over time and reliance on retrospective pain experiences which children may not be able to cognitively recall and/or compare. In an effort to minimize the effects of these factors, Erickson suggested researchers search for clinical situations in which pain intensity is relatively stable over time and examine children's self-reported pain across these time frames. This approach could be carried one step removed and applied to the study of children with chronic illnesses that are relatively stable over time. Indeed asthma is a chronic disease which has some relatively stable aspects over time. Thus, studying children with asthma on these proportedly stable aspects may

provide an opportunity to apply this strategy to examine the consistency across measures and time in children's self-report capabilities.

One study of dyspnea in children with asthma (Carrieri, et al., 1991) took a related approach. The researchers used school age children's self-report to describe the sensation of dyspnea. Results of this study indicated that children used verbal descriptor, color rating and visual analog scales consistently in measuring symptom intensity on a hypothetical good, bad and usual day. This study however did not include longitudinal follow-up on the children's ability to perform the ratings with consistency across time.

Research Questions

Data to provide assessment of children's self-report capabilities across measures and time do exist. In a recent study of children with chronic asthma, longitudinal data was collected from self-report of what the child felt was important in effectively managing their asthma. This data was collected at 3 months and 6 months using two measures on two groups, a control and an experimental group who received an educational intervention. Secondary analysis of this data was completed to answer the following questions:

1) Is there consistency in children's self-report regarding important asthma management issues over time, specifically at 3 months and 6 months?

2) Is there consistency in the children's self-report of what they feel is important between two rating methods (rank order and weighting) at the same point in time?

3) Does the level of consistency across time and measures differ by experimental versus control group?

Chapter 2

REVIEW OF THE LITERATURE AND CONCEPTUAL FRAMEWORK

Three areas of literature logically relate to the research questions. Consistency of self-report in children can be categorized into the following two types: consistency across time or longitudinal consistency and consistency between measurement tools at the same point in time. These two types of consistency can be equated to test-retest reliability and consistency between measures within a study and thus the first two sections of this literature review discuss previous studies of self-report in children that explicitly address these factors. In most instances this data is found in studies which report measurement tool reliability and validity. Children may be consistent between measures at the same point in time, but not necessarily consistent longitudinally and vice versa. The third consideration that was inherently built into this study due to the fact that it is based on secondary analysis of data from an intervention study, is the possible difference in consistency of self-report between control versus experimental group. The two different types of educational interventions used in this study may or may not impact consistency. Although neither intervention was explicitly designed to influence consistency, a theoretical/empirical examination of this potential needs to be considered.

Longitudinal Consistency

An early study looking at child self-report of anxiety was done by Castaneda, McCandless and Palermo (1956). A scale of manifest anxiety was adapted from Taylor's (1953) adult manifest anxiety

scale for use with fourth through sixth graders and was administered to 386 children in the school classroom. Test-retest reliability data were obtained from a subsample of 361 children in one week. The Pearson product-moment correlation coefficient of .90 was statistically significant at the .01 level. Although there was a short amount of time between test-retest and this was a large size sample, results indicated that these fourth through sixth grade children were capable of consistent self-report of manifest anxiety.

Harter (1982) developed and extensively tested a child self-report instrument, "The Perceived Competence Scale for Children" to assess a child's sense of competence across 4 different domains: cognitive competence in school, social competence with peers, physical competence in sports and general self-worth. Replication study results showed that children as young as 8 years make meaningful differentiations among the 4 areas tapped by the scale. Additionally test-retest reliability data were collected from a sample of 208 third through sixth graders in Colorado after 3 months and from 810 third through sixth graders in New York after 9 months. Correlations for the 4 subscales across time were .78, .80, .87 and .70 for the Colorado sample, and .78, .75, .80 and .69 for the New York sample. Again this data suggested that children in third through sixth grade were capable of consistent self-report of various aspects of competence and global self-worth even across relatively long time periods.

Hester (1984) developed a child report instrument entitled the Child's Health Self-Concept Scale (CHSCS). This instrument was

designed to measure the perceptions a child has concerning health and health-related behaviors. Reliability estimates of this instrument were obtained on a sample of 88 children, aged 7 to 12 (mean=8.92). The children completed the CHSCS twice with a four week interval. Coefficients of stability (Pearson product-moment correlation coefficients) were obtained by correlating the scores of the subscales across the 2 times. The coefficients for the subscales were .44, .46, .55, .57 and .58, all statistically significant at $p < .001$. These stability-reliability estimates were moderate in size, suggesting a moderate degree of consistency over time. Therefore, results suggested longitudinal consistency in 7 to 12 age children's self-report of health perceptions.

Lehmann, Bendebba & DeAngelis (1990) took a related approach when they studied the consistency of young children's assessment of remembered painful events. They wanted to explore an age cutoff above which children are consistent in reporting their pain, therefore their sample contained children between 3 to 8 years of age. Each child was interviewed in two separate sessions, 1-7 days apart. Results showed that children older than seven years were more consistent in reporting the relative pain intensity of remembered events than were younger ones (range 50-100% verses 20-55%, $p<0.001$). However, no age group was consistent more than 80% of the time on all measures.

Kovacs (1981) developed and tested the Children's Depression Inventory (CDI), a self report scale used to assess severity of depression symptoms. Following pilot testing and revision, the scale

was administered to 875 children, aged 10-17 years. Test-retest reliability in one month of .72 was obtained from a subsample of 28 of these children. While this was a small subsample in comparison to the original sample, it indicated that this older age group was capable of consistent self-report of depression symptoms over a one month time period.

Although there were limited studies on longitudinal consistency, particularly with younger children, the studies reviewed did indicate that children younger than 8 years were not consistent self-reporters across domains. Children older than 8 years were often found to be consistent over a variety of concepts and time periods ranging from one week to 9 months.

Consistency Between Measures at the Same Point in Time

Abu-Saad(1984) conducted an exploratory study of 10 children age 9 to 15 who were admitted to a hospital for surgical procedures. Children's vocal and facial expressions expressing pain were recorded to examine consistency between these two child expressions of pain and their self-reported position on a 0-10 cm. pain rating scale. While this was a small study, correlations indicated that child's self-report of pain was consistent across measures at the same time period.

Carrieri, et al (1991) conducted a descriptive, exploratory study with a convenience sample of 39 children between the ages of 7-13 (mean=10 5 years) to examine consistency between measures. Three methodologies were used to measure dyspnea intensity: a word descriptor scale, visual analogue scale and a color shade scale. The

authors report that the measures used were understandable to children. Mean scores differed significantly across good, usual and bad days by analysis of variance in the theoretically predicted direction. Individual pairwise comparisons using the Tukey procedure revealed significant differences between good and bad days (p=.001) for all three methods. Results of testing these 3 methods thus indicated that children, age 7-13, were capable of consistent self-report of dyspnea intensity at one time period, across measures.

Baranowski (1985) conducted a study to validate the accuracy of children's self-report of diet and aerobic activity. Observers followed 24 children for two full days from 7 A.M. to 7 P.M., and recorded everything the child consumed and all the aerobic activity the child performed. The average percent agreement between observers and children for exercise was 0.84 and for diet was 0.83. While the children may have been more accurate because of the continuous presence of an observer, results indicated that children were capable of accurate self-report regarding diet and activity in this prospective study.

Tiedeman & Clatworthy(1990) conducted a study looking at anxiety responses of 52, 5 to 11 year old children during and after hospitalization. Children's anxiety was compared using 3 different self-report tools, the Child Drawing Hospital, the Child Rating of Anxiety and the State Anxiety Inventory for Children at 3 different time points: at admission, at discharge and posthospitalization. Correlations between the measures of the children's anxiety ranged

from r= -.0242 to r=.4365. Only the correlation between the Child Rating of Anxiety and the State Anxiety Inventory for Children in the posthospitalization period (r=.4365) was significant at the .05 level of significance. This study did include the younger age group and the author expressed concern that perhaps the tools measured different aspects of anxiety. So the lack of correlation between measures may have been influenced by age and the measurement tools rather than indicating that children are not capable of consistent self-report of anxiety between measures. Repeated measures analysis of variance demonstrated a significant change in children's anxiety over time an all three measures of anxiety and there was a significant decrease in anxiety from admission to discharge, whereas anxiety remained fairly constant from discharge to posthospitalization. While not totally consistent, this indicated that these children were capable of some consistency regarding certain aspects of anxiety.

On the other side of the age spectrum, Hester (1979) studied the 4 to 7 year child's reaction to immunization. A group of 44 children rated the extent of pain during injection by responding to two self-report instruments. Results of these two instruments were tested for consistent responses using the Spearman Rank Correlation Coefficient. There was no significant correlation (rs= .051, t= 33.6, p > .740). This indicated that the children in this younger age group were not capable of consistent immunization pain self-report at the same point in time across these two measures.

In summary, studies of children younger than 8 years report less consistency between measures in self-report of pain or anxiety.

Children age 8 years and older were more consistent between measures at the same point in time with a variety of concepts to include pain, dyspnea, depression, diet and exercise.

Differences Between Control versus Experimental Groups

Both control and experimental group children received an educational intervention. The control group watched a video on physical aspects of asthma and the experimental group watched a video and was given a workbook on effective physician-child communication. Neither intervention specifically addressed the management concepts contained in the self-report instrument "How Important Is It?".

In tne literature, studies that explicitly explored the impact of interventions on consistency were not found. Based on sensation teaching literature, children might be more consistent if previously exposed to a concept or sensation (Johnson, Kirchhoff & Endress, 1975). However since neither intervention specifically addressed the concepts studied and the demographics of the two groups are similar, no differences are expected between the control and experimental groups in regard to consistency across time or between measures at the same point in time.

Conceptual Framework

Consistency is defined as "agreement or harmony of parts or features to one another or a whole" (Webster, 1989, p.280). Thus consistency has two parts: agreement to one another and agreement to a whole. Agreement to one another can be equated to harmony or similarity between measures at the same point in time. Agreement

to a whole can be equated to harmony or similarity of the same measure over time or longitudinally if the "whole" is construed to be the underlying, unchanging construct being measured. Thus in order to say that something or someone is consistent, two aspects need to be examined. These two aspects are similarity between at least two measures that attempt to measure the same concept at the same point in time and secondarily similarity between the same measure across time given that the concept is stable.

According to Piaget and Innhelder (1969), children proceed through age related stages of intellectual development. These ages and stages are as follows:

1) Preoperational: Age 2 to 7. The child is incapable of reasoning beyond his own immediate experience and beyond appearances. Things are as they seem to be rather than as they logically must be.

2) Concrete Operations: Age 7 to 11. The child can now use elementary logic and is capable of developing simple, causal explanations. Thought remains substantially limited to the child's own concrete experience of objects and events.

3) Formal Operations: Age 12 to adult. The child becomes capable of abstract thought and of conceptualizing unseen objects and phenomena.

Perrin and Gerrity (1981) describe children's understanding of illness based on this Piagetian theoretical framework as follows. In the preoperational stage, children tend to identify illness solely according to its directly experienced manifestations: "being ill" is

having to stay in bed. Bibace and Walsh(1980) report that this age group does not spontaneously conceptualize the internal structure of his body; instead the body is perceived essentially in terms of its visible surface. According to Perrin and Gerrity, in the concrete operations stage, the child is capable of developing simple, causal explanations to account for illness and recovery. In the formal operations stage, the child becomes capable of perceiving illness in physiological terms.

These frameworks can be used to theorize whether children could be consistent in self-report. Because children in the preoperational stage are incapable of reasoning beyond appearances, it seems logical that they would not be consistent longitudinally and questionable whether they would be consistent between measures regarding a concept such as asthma management. It might be hard for this child to identify with asthma management issues when the asthma is not currently bothering him. In the concrete operations stage, while thought remains limited to the child's own concrete experience of objects and events, the child is capable of developing simple, causal explanations to account for illness and recovery. Thus this age child would more likely be consistent in self-report dependent on what their previous experiences are with asthma. Consistency between measures at the same point in time would be expected more than longitudinal consistency due to the importance of the present on this age group's thinking. The formal operations child is capable of abstract thought and thus should be capable of

accurate self-report, both longitudinally and between measures at the same point in time.

Based on a literature review, children older than 8 years have some stable self concepts that they can report. Although few studies have explicitly looked at consistency between several measures at the same point in time, those that do have found consistency in the older than 8 year age group. Children younger than 8 were not found to be capable of consistent self-report between measures at the same point of time. Again, in studies looking at longitudinal consistency, children older than 8 were found to be consistent over a variety of time periods ranging from 1 week to 9 months and with a variety of sample sizes. Although children younger than 8 were consistent longitudinally on some aspects, this was not across all measures (Lehmann, et al, 1990). No studies were found that looked at consistency both between measures at the same point in time and longitudinally.

Based on theory of cognitive development and the above mentioned studies, children 8 years and older should be able to rate important aspects of asthma self management consistently with two measures, rank ordering and weighting, at the same point in time and at each of 2 time periods. Given that the importance of any specific strategy might change with time and cognitive development, more consistency would be expected between measures at the same point in time than longitudinally. Given that the educational intervention was different between the control and experimental group, but also considering that neither intervention targeted or

mentioned asthma management issues analyzed in this study, a difference was not expected between the two groups.

Chapter 3
METHODOLOGY

Design

This study involved secondary analysis of data collected during a longitudinal field study utilizing a randomized experimental-control design. The original study, funded by the Robert Wood Johnson Foundation (Primary Investigator, Gail Kieckhefer), was nested within yet a larger study funded by the National Center for Health Sciences Research (Primary Investigator, Robert Pantell; Co-Investigators, Catherine Lewis and Gail Kieckhefer). Both studies received approval of the University Protection of Human Subjects Committee. Initial results from these studies are reported elsewhere (Lewis, Pantell, Kieckhefer, 1989).

The parent study examined the effects of an educational program on resultant doctor-child communication. Physicians agreeing to participate were matched on the basis of gender, age, parenthood, and type of training. One member of each pair was randomly assigned to the experimental intervention group; the other to the control group. Child and parent assignment was determined by the assignment of their routine physician. Therefore, if the child's physician received the experimental intervention, the child and parent were automatically assigned to the experimental intervention. If the child's physician was assigned to the control, so were the child and parent.

The parent study's experimental intervention targeted all three participants: child, parent and physician. The experimental

intervention used age-appropriate videotapes and a workbook for the children. The parents viewed another videotape. Written materials and professional discussions were provided for the physicians. Information for all three groups stressed the importance of and presented techniques for effective physician-child communication.

Children and parents assigned to the control group jointly viewed one videotape on physical aspects of childhood asthma. Physicians in the control group received information on physiologic aspects of childhood asthma.

Participating physicians received either the experimental or control intervention at the onset of their entry into the study. Children and parents also received their experimental intervention or control videotape at entry into the study. For children and parents, this took place approximately 15 minutes prior to the child's scheduled medical visit.

Sample

The sample for the analysis reported here consisted of 45 children (30 boys and 15 girls) whose parents had consented to their involvement in the two previously mentioned studies. The children were diagnosed with asthma of over one year duration and had no additional chronic illnesses other than allergies. They ranged in age, at the time of study, from 8 to 13 years of age (mean 9.8 years). Median school grade was 4. Subjects were recruited from client listings of the general pediatric medical staff of University of California San Francisco Ambulatory Care Center, Moffitt Hospital

Pediatric Units, Long Hospital Emergency Room along with its daytime, pediatric equivalent to the ambulatory care center, and several private pediatric practices in the area. Participating parents were primarily mothers (43). One father was the participating parent and one "parent" was the biological grandparent and legal guardian of her grandchild.

Twelve subjects (27%) were in the control group, whereas 33 subjects(73%) were in the experimental group. The majority of parents described their child's health as fair, good or excellent (87%). The race of the accompanying adult was Caucasian(47%), Black(20%), Asian(13%), Hispanic(16%) and Other(4%). The majority of children came from intact married families(64%) with the remaining 36% a combination of single, divorced, separated or widowed. The mean parental income was $23,395. The mean educational level of the accompanying parent was 14 years; 87% of the parents had finished high school and 31% had completed 4 years of college.

Instrument

An instrument entitled, "How Important Is It?" was used to measure the personal saliency, that is, the importance to children of several asthma management concepts: preventing asthma, intervening during an asthma episode to stop the episode, feeling good about themselves despite having asthma, medication usage, being active, and not being different from peers. Measurement strategies used were rank ordering of these preselected concepts and quantification by asking children to weight the importance of each predetermined concept using a poker chip method. Prior to these

measurement strategies, an example was illustrated ranking importance of holidays to insure children could finish the procedures. No child showed difficulties with the example.

To obtain rank ordering, children were presented with 6 cards. Each card was preprinted with one of the following: preventing asthma attacks, stopping asthma attacks once they start, taking the right asthma medicine at the right time, liking myself, being active and not being different from friends. The cards were read to the children one at a time and laid down on the table for the children to see all simultaneously. The children were asked to first select the card which contained the item most important to them. They were next sequentially asked to select the card which is second, third and fourth in importance. Finally, they were asked to select which of the remaining 2 are most important to them.

To obtain relative saliency ratings, children were asked to quantify the relative importance of the 6 rank ordered concepts by placing 0 to 7 poker chips onto cards labeled with these concepts displayed one at a time in a random order. Children were given 7 poker chips and instructed to show the interviewer how important each concept was by placing chips on the card with more chips indicating more importance.

Procedures

Parental consent, child assent and demographic data from the accompanying parent were obtained in the clinic prior to the child's medical visit. Information needed to complete "How Important Is It" was obtained directly from the children during confidential

interviews held in the home at 3 months and 6 months. "How Important Is It" was embedded in a series of questionnaires taking approximately 45-60 minutes. It was presented during the last half of the questioning period.

Chapter 4

RESULTS

Item level analysis revealed that there was variability in concepts chosen as most salient. For example with rank ordering at 6 months, 25% ranked prevention, 20% ranked stopping attack, 15% ranked medication, 17.5% ranked feeling good, 12.5% ranked being active and 10% ranked being no different as most salient. This same pattern of all concepts being chosen by at least one child at each level of importance for ranking and all possible variables being used for weighting by number of chips was found throughout the study, thus indicating that this was a varied population and that all 6 concepts used in the study appeared valid for this population.

Longitudinal Consistency

Longitudinal consistency was analyzed utilizing a correlation matrix and 2 tailed P-values generated by the CRunch Interactive Statistical Package. A significance level of .05 was determined to be the critical level for statistical significance. Results of rank ordering of the 6 concepts and weighting by number of chips placed on each of the 6 concepts were compared for each child between the 3 and 6 month time period. Because of study attrition, data was analyzed for only 40 children out of the original 45 children(89%) who provided data at both time points. A positive relationship and significant correlation was expected, indicating that the saliency of the concepts was directly and significantly related between the 2 time periods.

All correlations except one, rank ordering of stopping attack, were positive, thus indicating that most concepts were positively

related as expected regardless of method. However, not all comparisons were statistically significant. With the rank ordering, only one of the concepts, prevention, was significantly correlated between the 2 time periods ($r=0.33$, $p< .05$). With the weighting by number of chips, 4 out of 6 concepts were significantly correlated between the 2 time periods. They are as follows: preventing asthma attacks, stopping asthma attacks once they start, taking the right asthma medicine at the right time and liking myself. The longitudinal consistency data is documented in Summary Table 1. Listed are the correlations and significance levels for identical methods across these 2 time periods.

Table 1
Summary of Longitudinal Consistency Correlations

	Rank Order at 3 & 6 Months	Weighting by Number of Chips at 3 & 6 Months
Prevention	0.33*	0.48**
Stop Attack	-0.28	0.45**
Medication	0.08	0.58***
Feel Good	0.06	0.42**
Be Active	0.22	0.24
No Different	0.17	0.17

*p< .05 ** p< .01 *** p< .001

Consistency Between Measures

Consistency between measures was also analyzed utilizing a correlation matrix with 2 tailed P-values generated by the CRunch Interactive Statistical Package. A significance level of .05 was again determined to be the critical level for statistical significance. Correlations were obtained by comparing rank ordering of each of the 6 concepts with the weighting by number of chips data of that same concept at the same time period. Data was analyzed separately for the 3 and 6 month time period. Data was collected and compared on 45 children at the 3 month time period. As with the longitudinal consistency data, because of attrition, the sample at 6 months was only 40 children or 89% of the original sample. An inverse relationship and thus a negative relationship and correlation between the 2 measures was expected if the children were consistent self- reporters. This inverse relationship is expected because if rank ordered as the first concept of importance, a high number of chips is expected with the weighting by number of chips for this same concept.

All items had negative correlations indicating that they were inversely related as predicted. However, not all relationships were statistically significant. At the 3 month time period, 4 out of 6 concepts were significantly correlated at $p < .05$: prevention, taking medication, being active and being no different. At 6 months, only 3 out of the 6 concepts were correlated at $p < .05$: prevention, being active and being no different. The between measure consistency data is documented in Summary Table 2. Listed are the correlations

between rank ordering and weighting by number of chips for each of the 6 concepts at each time period.

Table 2

Summary of Between Measure Consistency

	3 Months	6 Months
Prevention	-.35*	-.47* *
Stop Attack	-.21	-.04
Medication	-.35*	-.20
Feel Good	-.18	-.00
Be Active	-.43* *	-.59* * *
No Different	-.41* *	-.36*

* p< .05 * * p< .01 * * * p< .001

Differences by Group: Experimental versus Control

Differences between the experimental and control groups were analyzed utilizing repeated measures multifactor analysis of variance (ANOVA) with the CRunch Interactive Statistical Package. Twelve separate analyses compared results of the 2 time periods against control versus experimental group. For example, rank ordering and weighting by number of chips of prevention at 3 months was compared to rank ordering and weighting by number of chips of prevention at 6 months and also compared for experimental versus control group. Therefore two separate analyses were completed for each concept across two time periods. If the control and

experimental groups were similar, no significant effects would be found.

No statistically significant effects were found between the control and experimental groups either between measures or longitudinally. P-values ranged from .08 to .95, thus none were significant at the critical $p < .05$ level. This is in agreement with the hypothesis that the type of education intervention and thus placement in the control versus experimental group would not effect consistency of self-report in this study.

Chapter 5
DISCUSSION

Longitudinal Consistency

It was expected that children would be consistent across a 3 month time period with both rank ordering and weighting by number of chips. However, study children were not as consistent longitudinally as expected. If looking at the statistical significance and consistency of rank ordering, children were consistent with only 1 out of 6 concepts or 17%. If looking at the consistency of weighting by number of chips, they were consistent with 4 out of 6 concepts or 67%. If looking at the total consistency between both measures (rank ordering and weighting by number of chips), they were consistent with 5 out of 12 measures or 42%.

This is less longitudinal consistency than is expected in this 8-13 year age group. A study by Lehmann et al. (1990) of children age 3 to 8 years found that children older than 7 years were consistent 50-100% of time in reporting the relative pain intensity of remembered events. Therefore longitudinal consistency of at least 50% was expected in this study if findings in this 8-13 year age group are similar to Lehmann's results in the 7-8 year age group. Considering the low rate of consistency with the entire rank ordering measure (17%) and the much higher rate of consistency with the weighting by number of chips measure (67%), a problem with the rank ordering measurement tool is a possibility. Perhaps children have a hard time with rank ordering. Studies by Eland (1974, 1983), found children to be consistent across time in rank ordering cartoon

pictures of a dog in various painful situations. And at the time of development of the "How Important Is It" tool and the original study, rank ordering was believed by the author to be a more basic concept than weighting by number of chips and thus easier for the children to comprehend and accomplish (Kieckhefer, 1991, personal correspondence). Perhaps this is not so. Further work is needed to clarify whether children are capable of rank ordering and if so, on what concepts is this possible.

Children showed more consistency with the weighting by number of chips ranking. Weighting by number of chips is more dependent on their input than rank ordering which is multiple choice from a total of 6 concepts. With the weighting by number of chips, only 1 concept is presented at a time whereas with rank ordering all 6 concepts are presented simultaneously. In keeping with their Piagetian stage of development, weighting by number of chips is more visual and requires only thinking of one concept at a time rather than comparing 6 concepts at the same time. Thus it is a more concrete request. The child concentrates on only one concept at a time with the weighting by number of chips whereas with rank ordering, the child has to consider all 6 concepts at a time. Thus weighting might be cognitively easier for them to understand and thus a more accurate representation of their abilities.

Given wide differences in their abilities, results indicate that children age 8-12 years with asthma were not capable of longitudinal consistency in self-report of salient self-management

strategies more than 67% of the time even using their best method, weighting by number of poker chips.

Consistency Between Measures

It was expected that children would be consistent between both measures on all 6 concepts. Again as with longitudinal consistency, between measure consistency was not as high as expected. Children were consistent with 4 out of 6 concepts at 3 months or 67%. Children were consistent with only 3 out of 6 concepts at 6 months or 50%. Prevention, taking medication, being active and being no different were consistent at 3 months. At 6 months, taking medication was no longer consistent, but the other 3 concepts remained consistent. Thus there was a moderate degree of between measure consistency.

Since more consistency was expected, the measurement tools themselves could be one causative factor. In the longitudinal data analysis, children were not consistent with the rank ordering measure. If children in this age group and study were unable to rank order, that would decrease the between measure consistency results. With a problematic measure, consistency is likely not to be found even if the respondent is capable.

The concepts themselves could be another factor. Are these concepts really important to these children with asthma? Previous research suggests so (Kieckhefer, 1986). Additionally, item level analysis, as previously mentioned, suggests that all 6 concepts were important to these children. This is suggested since at least one child ranked each concept as most salient and also at least one child used

each number of chips when weighting the separate concepts. Given this range selected and the moderate degree of consistency between measures, the lack of importance of the concepts does not seem the most probable explanation.

A third explanation of the nonsignificant findings could be sample size. The small sample size (40 and 45 subjects) would decrease the likelihood of finding statistically significant results. However since some findings were statistically significant and other findings not, the small sample size is probably not the most prominent reason that these children were not as consistent as expected.

Given that there are some innate differences between each child that cannot be controlled such as previous knowledge level, previous exposure to health education, severity of illness, timing of last asthma attack, etc. and that there were some questions about the validity of rank ordering in this study results indicate that developmentally these children were not capable of consistent between measure self-report using the 2 measures of rank ordering and weighting by number of poker chips more than 67% of the time.

Chapter 6
SIGNIFICANCE TO NURSING

Because of the small sample size, specialty population and a lack of strong results, results should not be made directly applicable to the general population. Results were mixed. They did not show 100% capability to self-report. On the other hand, 8-13 year old children's ability to self-report was not ruled out either.

What was found that can be helpful to nursing science? Results lend one more piece of evidence looking at children's capabilities to self-report. While results are not totally consistent, they did indicate that children were capable of some aspects of self-report. Further studies need to be done looking at the preoperational and concrete operational child's ability to self-report, expanding the studies using other tools, particularly tools that have been previously validated with children. Additionally, these studies need to be expanded to include healthy children and children with other chronic diseases.

When using self-report in caring for children, nurses need to consider the child's development stage, the method of self-report and the concept under consideration. Previous studies suggested that the concrete operations child would be capable of consistent self-report. This was not totally supported by study results. Therefore health care providers should exercise caution in interpreting a child's report as fact without additionally considering the method and concept. Whenever possible, it would be helpful to use two methods of self-report to make sure children are capable of self-report and that they comprehend the questions. The method of self-report may be an

important factor in obtaining accurate information. This study suggests that children age 8-13 years are not capable of consistency using rank ordering. Therefore particular caution needs to be exercised in utilizing self-report with a rank order measurement tool in this age group. The concept itself is another factor to consider. The concept should be one that is important to the child and one they are capable of understanding. As illustrated by this study, even when the concept is thought to be salient to the child, consistency is not necessarily found.

How can these results be applied to the care of children with asthma? We need to recognize that each child is a unique individual and based on their previous life experiences will have different thoughts, perceptions and philosophy of asthma management. The uniqueness of each child was illustrated by the ranking of saliency. We can not generalize one concept that was consistently and by a large margin more important to children with asthma. However, out of 6 concepts, prevention is the only concept that was consistent both longitudinally and between measures. This may be an indication of the current emphasis and focus of asthma management and the philosophy of asthma education. Health care education stresses the importance of prevention and perhaps the children are reflecting back the emphasis of this education. It may indeed indicate that prevention is the most salient concept for asthmatic children and is now a part of most asthmatic children's philosophy of self-care. If so, prevention should continue to be emphasized in order to increase knowledge, broaden their self-care capabilities and increase their

self-esteem. However, while prevention is a worthwhile concept to target and should continue to be stressed, asthma management and health teaching needs to be comprehensive and individualized to meet the needs of each child.

References

Abu-Saad, H. & Holzemer, W. (1981). Measuring children's self-assessment of pain. Issues in Comprehensive Pediatric Nursing, 5, 337-349.

Abu-Saad, H. (1984). Assessing children's responses to pain. Pain, 19, 163-171.

Baranowski, T. (1985). Methodologic issues in self-report of health behavior. Journal of School Health, 55(5), 179-182.

Bibace, R. & Walsh, M. E. (1980). Development of children's concepts of illness. Pediatrics, 66(6), 912-917.

Carrieri, V. K., Kieckhefer, G., Janson-Bjerklie, S. & Souza, J. (1991). The sensation of pulmonary dyspnea in school-age children. Nursing Research, 40(2), 81-85.

Castaneda, A., Boyd, R., & Palermo, D. (1956). The children's form of the manifest anxiety scale. Child Development, 27(3), 317-325.

Clatworthy, S.M. (1978). The effect of therapeutic play on the anxiety behaviors of hospitalized children. (Doctoral dissertation, Boston University School of Education, 1978). Dissertation Abstracts International, 38, 6142B.

Erickson, C. J. (1990). Pain measurement in children: problems and directions. Developmental and Behavioral Pediatrics, 11(3), 135-137.

Harter, S. (1982). The perceived competence scale for children. Child Development, 53, 87-97.

Hester, N. K. (1979). The preoperational child's reaction to immunization. Nursing Research, 28(4), 250-254.

Hester, N. (1984). Child's health self-concept scale: its development and psychometric properties. Advances in Nursing Science, 45-55.

Johnson, J. E., Kirchhoff, K. T. & Endress, M. P. (1975). Altering children's distress behavior during orthopedic cast removal. Nursing Research, 24(6), 404-410.

Kieckhefer, G. M. (1986). Impact of an active communication intervention with school-age children with asthma. Unpublished manuscript.

Kovacs, M. (1981). Rating scales to assess depression in school-aged children. Acta Paedopsychiat, 46, 305-315.

Lehmann, H. P., Bendebba, M. & DeAngelis, C. (1990). The consistency of young children's assessment of remembered painful events. Developmental and Behavioral Pediatrics, 11(3), 128-134.

Lewis, C. C., Pantell, R. H. & Kieckhefer, G. M. (1989). Assessment of children's health status: field test of new approaches. Medical Care, 27, S54-S65.

Perrin, E. C. & Gerrity, P. S. (1981). There's a demon in your belly: children's understanding of illness. Pediatrics, 67, 841-849.

Piaget, J. & Inhelder, B. (1969). The Psychology of the Child. New York: Basic Books.

Reynolds, C. R. & Richmond, B. O. (1979). Factor structure and construct validity of "what I think and feel": the revised children's manifest anxiety scale. Journal of Personality Assessment, 43(3), 281-283

Taylor, J. A. (1953). A personality scale of manifest anxiety. Journal of Abnormal Social Psychology, 41, 81-89.

Tiedeman, M. E. & Clatworthy, S. (1990). Anxiety responses of 5- to 11- year-old children during and after hospitalization. Journal of Pediatric Nursing, 5(5), 334-343.

Tsigounis, S. A. (1978). The relationship between parent-child perceptions of hospitalization and the child's subsequent psychological response. (Doctoral Dissertation, California School of Professional Psychology, 1977). Dissertation Abstracts International, 38, 3915B.

Webster's Ninth New Collegiate Dictionary. (1989). Springfield, MA: Merriam-Webster.

APPENDIX A

HOW IMPORTANT IS IT

I am going to be asking you how important YOU think certain things are to you. Not all things will be as important as others. What I am interested in is finding out what's most important to YOU.

For example, some holidays may be more important to you than other holidays. If I asked which holidays are most important to you, what would you say? (Interviewer to await a response.)

OK, now I'd like you to think about things that are important to you in connection to your having asthma. First I'd like you to think about the things you believe are most important for taking care of you asthma. Of all the things you do, or could do, what do YOU think is most important for YOU?
(Interviewer to list verbatum comments. After child gives each comment, ask: What's the next most important thing? Continue until child can give no further responses, or 4 responses are obtained.)

1. a.
   b.
   c.
   d.

2. Now I'm going to show you cards on which I have printed things that other children about your age have said are important to them. These are: (Interviewer to present cards in fixed order to child.)

   Preventing asthma attacks. (1)
   Stoping asthma attacks once they start. (2)
   Taking the right asthma medicine at the right time. (3)
   Feeling good about myself even though I have asthma. (4)
   Being active. (5)
   Not being different from friends. (6)

Tell me which of the things printed on the cards is MOST important to you? (Interviewer to record card number selected by child.)
   a.

Which is next important?
   b.

And next important?
   c.

Next important?
   d.

And which of these two left is more important to you?
   e.

(Interviewer to record remaining card number.)
   f.

3. Now I'm going to lay each of these cards out on the table one at a time. I'll ask you to show me how important each of these 6 things are to you by having you put chips on the cards. (Interviewer to place the 7 chips on the table in front of the child.) The more important you think the thing listed on the card is to you, the more chips you should put on that card. You don't have to put any chips on a card if what's listed on it is not really important to you.

For example, thinking about the holidays again, if the fourth of July was very important to me, I'd give it at least a couple of chips. If it were the only important holiday for me, I might give it all 7 chips. But, if I didn't think the fourth of July was important at all, I wouldn't give it any chips. (Interviewer to demonstrate with an appropriate card.)

Now you show me how important the things listed on these cards are to you by placing however many chips you want on each of the cards. Remember, the more chips you put on a card, the more important you think the thing printed on the card is to you. (Interviewer to prcees through the cards in random order, listing number of chips put on each card.)

Card#	Number of chip
1.	____
2.	____
3.	____
4.	____
5.	____
6.	____

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