RELIABILITY AND VALIDITY TESTING OF THE ADOLESCENT TRANSACTION SCALE

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BY

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To Dean of Graduate Studies and Research:

I am submitting herewith a dissertation written by Mary Heiens Brown entitled "Reliability and Validity Testing of the Adolescent Transaction Scale". I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.

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DEDICATION

This work is dedicated to the memory of my husband, Tom and to the honor of my children, Angela and Michael, and my parents, Robert and Jean Heiens, whose love, support, and constant encouragement helped me to finish this project. And to God be the glory.

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ABSTRACT

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The purpose of the study was to psychometrically test a newly developed instrument, the Adolescent Transaction Scale (ATS), to measure adolescent's assessments of transactions with health care providers (HCP). The ATS was based on Imogene King's theory of goal attainment and her operational definition of transaction, one of the concepts of her theory.

Reliability and validity were established by calculating a Cronbach's alpha and doing a factor analysis using principal axis factoring with orthogonal varimax rotation. Content validity had been previously established. A convenience sample of 250 students 15-17 years of age who were in tenth grade homeroom classes at a large suburban public high school completed usable surveys. Participation was voluntary and implied parental permission with adolescent consent was used.

A Cronbach's alpha correlation coefficient was used to estimate internal validity. Cronbach's alpha on the 32-item scale was 0.8210. Inter-item correlations were reviewed and used to further revise the instrument. Following revisions based on the inter-item correlations and factor analysis, the alpha of the final 16-item scale was 0.9226.

The final factor analysis procedure produced three factors with 16 items that loaded at 0.45 or higher. Rotation converged after eight iterations and accounted for 51.9% of the variance. Five of King's six elements in her operational definition of transaction loaded into three factors. Initiate and respond on one factor, means explored and agreement on means with movement toward the goal on one factor, and problem identified on one factor. The sixth element, goals set, was not represented by any one factor, but loaded on factors one and two.

The final 16-item scale possesses excellent internal consistency reliability and construct validity. These 16 items will serve as a strong core for further development of the ATS.

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CHAPTER 1

INTRODUCTION

Adolescence is a time of great physiological and psychosocial change. During these critical developmental years, adolescents will experiment with a variety of behaviors and changes in lifestyle as part of the natural process of separating from parents, developing a sense of autonomy, increasing independence, establishing who they are and acquiring the skills to function as an effective and independent adult (Botvin & Botvin, 1992). Adolescents engage in problem behaviors such as experimenting with drugs and sex because adolescents believe these behaviors will help them achieve desired personal goals (Botvin & Botvin, 1992).

Because of their invincible attitude, adolescents put themselves increasingly at risk for developing health problems due to poor life style choices. Lack of knowledge and misunderstanding lead to choices that can impact their health throughout life. Risk behaviors by adolescents result in deaths due to motor vehicle accidents, and substantial morbidity and social problems due to teen pregnancy and sexually transmitted diseases (Kann, et al., 1995).

Because of maturational changes and lifestyle experimentation, poor habits developed by adolescents can become permanent. Health risk behaviors contributing to the leading causes of mortality and morbidity are often established during youth and extend into adulthood (Kann, et al., 1995). In order to avoid poor health outcomes, it is

important that adolescents take responsibility for their health, and establish good health habits and goals (U.S. Dept. of Health & Human Services, 1991).

Communication between parents and adolescents can be difficult. Sometimes parents are not knowledgeable and do not always have answers to questions about health issues, or may be embarrassed to factually respond to sensitive questions. As a result, adolescents turn to those with whom they can communicate easily in order to gain information regarding embarrassing subjects. Often they turn to peers who have as little and often as incorrect information as they do (Wong, 1995).

Adolescents are reluctant to seek health care for problems they do not consider to be physical in nature (Wong, 1995). They present seeking help for a benign physical problem and often will not express that their true reason for seeking health care is to gain information regarding a social, sexual, or psychological problem. Many times their agenda is incongruent with that of the health care provider (HCP) and adolescents will leave the encounter without fulfilling the goal of obtaining the information they sought. In other words, the transaction between adolescent and health care provider was not successful.

Transactions, or sharing information to achieve goals, occur daily between patients and nurses and are critical points to goal attainment (King, 1981). They are particularly critical in encounters with adolescents because these individuals are usually healthy and not likely to interact frequently with HCP.

Successful transactions involve sharing of information, with which nurses and clients can mutually set goals. Transactions are an integral part of King's (1981) theory of goal attainment (TGA) and are the valuation pieces of interaction between nurse and client. When transactions are completed, goals are attained (King, 1981). Failure to attain goals requires an objective evaluation of the transaction. To evaluate, elements of transaction must be identified and measured. The concept of transaction, as defined by King (1981), uses elements to identify the steps of a transaction but lacks a method to measure its effectiveness.

In reviewing the literature, only one instrument (Binder, 1992) was located that measures adolescent transaction. This instrument, the Adolescent Transaction Interview Guide (ATIG), was developed by Binder to determine adolescents' perceptions of health care transactions with doctors and nurses. The 32-item guide is used to ask adolescents about their experiences when interacting with doctors and nurses.

To evaluate transactions, Binder (1992) used audiotaped interviews with adolescents that were later transcribed. After transcription, they were analyzed and scored according to King's (1981) elements of transaction. The scoring process is time consuming and can be subjective. All of the elements of transactions were identified in the interviews, but not all were present in each individual interview. The elements Binder identified were: initiates behavior, opposite member responds, problem is mutually identified, a goal is mutually agreed upon, there is mutual exploration to achieve the goal, and mutual movement toward the goal. The ATIG identifies the presence of King's

transaction elements, but not the adolescents' perception of the quality of the transaction. The Adolescent Transaction Scale (ATS) is able to quantitatively measure adolescents' perception of the quality of their interactions with HCP.

Problem of Study

The purpose of this study was to psychometrically test a newly developed instrument to measure adolescent's assessment of transactions with HCP. This instrument is called the Adolescent Transaction Scale (ATS).

Rationale

Adolescents, because of their developmental stage, are a large population of patients that are in need of guidance in healthy life style choices and practices. The absence of clearly defined health goals may lead to risk-taking behaviors. Drugs and sexual activity are two major areas explored by adolescents without benefit of guidance and appropriate goals (Kann, et al., 1995). Such exploration often results in sexually transmitted diseases (STDs), unplanned pregnancies, drug and alcohol related accidents, and unhealthy life practices (Kann et al., 1995). Three million STDs are acquired annually by teenagers, one million become pregnant, and the human immunodeficiency virus (HIV) is now reported as the sixth leading cause of death among young people aged 13-24 years (Centers for Disease Control [CDC], 1998a). Alcohol is involved in approximately 35% of adolescent driving fatalities (National Center for Injury Prevention and Control [NCIPC], 1998). There are an estimated three million underage smokers in

the United States (US). The number of adolescents who become daily smokers by age 18 years increased by 73% from 1988 to 1996 (CDC, 1998b).

Health care providers have very brief contact with healthy adolescents and it is important that HCP take advantage of every interaction to help guide them in establishing good health habits. Well-child or sports physical visits are one of the few opportunities to interact with adolescents. Adolescents tend to discount parental warnings about poor health practices, but will listen to adults outside the family. Research has shown that brief anti-smoking messages from health care providers have a powerful impact on adolescent patients (Ammerman, 1998). However, many times during these well visits, providers are so busy trying to get their anti-smoking, anti-drug, and anti-sex messages across that issues and goals the adolescents have are never discussed. Using an objective evaluation of adolescents' perceptions of their interactions with HCP may help these providers have an increased awareness of areas of problems in their interactions with adolescents. Awareness of the steps in transaction and where the perceived problems are may help health care providers target their information and interventions to areas identified by the adolescent. Beginning every encounter with adolescents by asking them if they have any concerns about their health or health practices and if they have any questions can easily guide assessment and intervention. Improved transactions between HCP and adolescents may help adolescents make more informed choices and help deter some of the risk-taking behaviors. Goals that are mutually agreed upon can be established and much more likely to be achieved leading to improved health outcomes for adolescents.

King (1981) defined transaction as "observable behavior of persons interacting with their environment" (p.147). When nurses and patients make transactions, they exchange values about the situation. When they share information, they identify areas where they can mutually set goals (King, 1981). In order for goals to be attained, transactions must occur. To ensure good health outcomes, areas of concern and interest to the adolescent must be identified. Goals must be mutually set with both parties moving toward the goal of healthy practices (King, 1981).

Bales (1950) developed a tool, the Interaction Process Analysis (IPA), which was used to assess small group interaction. The IPA was modified and used to assess interaction between pediatricians and mothers. The Nurse Orientation System (NOS), developed by Diers and Schmidt (1977), was used to measure interaction between nurse and patient. Neither the IPA nor the NOS measure transaction as identified by King and, like the ATIG (Binder, 1992), rely on analysis of tape recorded interviews.

Because of the amount of time involved in the interview process, the cost and time involved in transcription, and the susceptibility to bias (Pedhazuer & Schmelkin, 1991), a need exists for an objective instrument that will measure adolescent assessments of transaction with HCP. The interview questions, contained in Binder's ATIG and adolescent responses were used to develop the ATS to measure the adolescent's assessments of transactions with HCP.

The ATS will enable adolescents' assessments of transactions to be measured more quickly. Problem areas can be identified to improve transactions with HCP, thus

improving the adolescent's ability to communicate needs to HCP. Incorporating the elements of transaction into interviews with adolescents will improve communication between the adolescent and the nurse. In early adolescence, teens are just beginning to develop formal operational thinking (Piaget, 1972). This group is beginning to learn to plan ahead and identify future consequences of their actions. During middle adolescence, teens are able to better understand future implications of their current behavior, practices, and decisions and have developed the capacity for abstract thinking (Wong, 1995). Improving communication during this important, formative time, could enhance delivery of appropriate care, and more effectively meet the adolescent's needs for health care information. Health care information will allow adolescents to make informed choices, increase ownership of the responsibility of self-care, decrease risk behaviors, and improve health outcomes. An instrument to measure how adolescents assess their interactions with health care providers based on King's operational definition of transaction may help identify areas of needed improvement in order to make successful transactions.

Theoretical Framework

The ATS is based on Imogene King's TGA (1981). This theory is derived from the interpersonal system of her overall conceptual framework. The nurse and client represent one type of interpersonal system. The TGA is composed of the concepts of interaction, perception, communication, transaction, role, stress, growth and development, and time and space. These concepts actively interrelate for goal attainment to occur (King, 1981).

To test her theory, King (1981) observed nurse-patient interactions leading to transactions in concrete nursing situations. To make these observations, she first had to operationally define transaction. The steps or elements to identify a successful transaction are outlined:

1. One member initiates behavior.
2. The opposite member responds.
3. A problem is mutually identified.
4. A goal is mutually agreed upon.
5. There is exploration of means to achieve the goal.
6. There is agreement on means to achieve the goal with mutual movement toward the goal.
7. Transaction is made.
8. Goal is attained.

The first six steps of this operational definition of transaction were used to help categorize Binder's (1992) adolescent interview questions. These questions and the information from the adolescents' responses, were used together to develop the ATS to measure adolescents' assessments of transactions with HCP.

Assumptions

The major assumptions from King's (1981) theory of goal attainment that involve transactions are as follows:

1. If perceptual accuracy is present in nurse-client interactions, transactions will occur.
2. If role expectations and role performance as perceived by nurse and client are congruent, transactions will occur.
3. When mutual goals have been identified, means have been explored, and nurse and client agree on means to achieve goals, transactions will be made and goals attained. (p. 149).

Research Questions

1. Does the Adolescent Transaction Scale (ATS) demonstrate acceptable internal-consistency reliability (Cronbach's alpha $\geq$ .80)?
2. Do all items of the ATS interrelate in measuring the concept of transaction (construct validity/factor analysis)?

Definition of Terms

The following key terms were defined for the study:

Adolescent was defined as an individual in transition between childhood and adulthood who is 11-20 years of age (Wong, 1995). Wong (1995) identifies early adolescence as 11 to 14 years and middle adolescence as 14 to 17 years. For this study, an adolescent was operationally defined as an individual 14 and 17 years of age in a large public school district in the southwestern United States.

Adolescent Transaction Scale (ATS) was defined, as an instrument developed to measure King's elements of transaction. Operationally defined it was a 32-item

instrument, answered by using a 5 point Likert scale, to measure adolescent assessments of transactions with health care providers. Likert answers range from never to always and were scored 1-5 accordingly. Individual item scores were then summed to give an overall transaction score for each subject.

Factor Analysis Construct Validity was defined as a process that determines the structure of a set of variables by analyzing the inter-correlations among them (Polit, 1996). Operationally it will be defined as the process of determining factors from items that load at .45 or higher.

Health care provider (HCP) was defined as a professional person who provides health care services to individuals (Binder, 1992). In this study, it was a nurse in any setting, an advanced nurse practitioner (nurse on the ATS), a physician assistant, or a physician (doctor on the ATS).

Internal Consistency Reliability was defined as an estimation of reliability based on the premise that items in an instrument measure the same phenomenon (Pedhazuer & Schmelkin, 1991). This was operationally measured using a Cronbach's alpha. The ATS is considered to be internally consistent if a Cronbach's alpha equal to or greater than .80 is achieved.

Transaction was defined as observable behavior of individuals interacting with their environment and communication in order to exchange values and mutually set goals in a health care situation (King, 1981). This concept was operationally defined as scores obtained on the ATS.

Limitations

Factor analysis requires a large sample. It is recommended to have at least 300 cases for factor analysis (Tabachnick & Fidell, 1996). The use of adolescents requires parental notification and passive or active permission and willingness of the adolescent to participate. The school system preferred to choose the school and the school chose the grade to participate. Teachers had the option to choose whether or not their homeroom participated. Communication was via written information put in the teacher's box. These factors made it necessary to use convenience sampling in order to enroll the needed number of subjects and limited the number of available and willing subjects. Convenience sampling limits the generalizability of the sample and the instrument may not be reflective of all 14-17-year-olds.

Summary

Adolescents, because of their developmental stage, are a large population of patients that are in need of guidance in healthy life style choices and practices. Adolescents usually have limited contact with HCP and it is important that HCP take advantage of every interaction to help guide them in establishing good health goals. An instrument to measure how adolescents assess their interactions with HCP based on King's operational definition of transaction may help identify areas of needed improvement in order to make successful transactions.

CHAPTER 2

REVIEW OF THE LITERATURE

Conceptualizing transaction assists health care providers (HCP) to evaluate their interactions with adolescents and enhance achievement of health goals. Quantifying the concept of transaction enables a more objective evaluation. Quantification is based on Imogene King's operational definition of transaction.

Information on King's theory of goal attainment (TGA) is reviewed. King's operational definition of transaction and its use in nursing studies and interventions are presented. Literature from which King based her concept of transaction is also reviewed. The concept of transaction is closely related to interaction so studies and instruments measuring interaction between HCP and adolescents and children are also reviewed.

The process of instrument development, including item generation, reliability and validity testing is discussed. The intent of this review of literature is to provide support for the significance of the instrument development and a background against which results can be measured.

Theory of Goal Attainment

The TGA describes the nature of nurse-patient interactions that lead to transactions and then to goal attainment (King, 1981, 1992). In this theory, nurses assess patient problems by determining their and the patient's perceptions of the problem through communication and interaction. Nurses plan with patients by making decisions

about goals and they agree on the means to achieve these goals. The making of transactions are the implementation piece and the process is evaluated by whether goals were attained or if not, why not (King, 1992, 1996).

The TGA was derived from King's conceptual system and concepts in the personal and interpersonal systems were used to formulate the theory. The ten major concepts in the TGA are perception, communication, interaction, transaction, self, role, growth and development, coping with stress, time and personal space (King, 1992).

King (1981) tested her TGA by conducting a descriptive study to explain nurse-patient interactions that lead to transactions in a concrete nursing situation. She used a continuous time series of data of observations of nurse-patient interactions in one hospital to inductively develop an operational definition of transaction. This first phase of testing the TGA was designed to answer the following three questions.

1. What elements in nurse-patient interactions lead to transactions?
2. What are the relationships between the elements in the interaction that lead to transactions?
3. What are the essential variables in nurse-patient interactions that result in transactions? (King, 1981).

This study described an interpersonal system of nurse-patient interaction. A major assumption was that the behavior of one person (nurse) influences the behavior of the other person (patient) and visa versa (King, 1981).

Transaction

In order to understand King's TGA, a clear understanding of her operational definition of transaction is needed. Transactions take place when the six elements of transaction are present (King, 1992). These are as follows.

1. One member of the nurse-patient dyad initiates behavior.
2. The opposite member on the dyad responds.
3. A disturbance or problem is identified.
4. Both members of dyad mutually agree upon some goal.
5. One member initiates means to achieve the goal.
6. Other member agrees with means and both move toward the goal. (King, 1981).

When King (1981) was developing her TGA, the term "transaction" was not a term used in the nursing literature. The term originally came from a study of Dewey's Theory of Knowledge (Dewey & Bentley, 1949). Dewey viewed transaction as involving agents of the individual and the environment. Dewey stated that it takes two parties to make a transaction and they can be observed talking, writing, and coordinating behavior. Dewey also brought in the idea of transaction taking place over time and space (Dewey & Bentley, 1949). King also used ideas from Allport, a professor of social and political psychology. Allport (1955) identified transaction in terms of the perception of an event that takes place between the organism and the environment and has its roots in past experiences of the individual. King combined these ideas into her concepts in her TGA.

Measurement of Transaction and Testing of the Theory of Goal Attainment

Little research has been done to identify and further test King's operational definition of transaction or to develop an instrument to measure transaction. The Adolescent Transaction Interview Guide (ATIG) (Binder, 1992) was the only instrument found that seeks to identify all the elements of King's operational definition of transaction in interactions between patients and HCP.

The ATIG consists of 32 scripted questions used primarily in an open-ended format. The instrument was developed based on the information sought. Binder, a nurse educator, derived the categories of questions from the literature and King's (1981) theoretical framework based on the concepts of health, health practices, interaction and transaction (Binder, 1992). Questions for the ATIG were generated using a case study technique. Two case studies were developed using King's TGA and operational definition of transaction. Each case represented the opposite ends of the transaction process. A panel of four nurses submitted 38 primarily open-ended questions for the case studies. These questions were evaluated for clarity and 32 were chosen by Binder and sequenced according to content with more sensitive questions at the end. The first six questions generally orient the adolescent to the interview topic and help to establish rapport. The remaining 26 questions reflect the six elements of the transaction process (Binder, 1992).

Reliability of the ATIG was established using test-retest, intra-rater, and equivalence procedures in a pilot study (Binder, 1992). Subject's test-retest agreement level was 81%. Intra-rater reliability and equivalence levels of agreement were both 94%.

Binder (1992) also developed a demographic data sheet that contained seven questions asking for information regarding age, sex, race, grade in school, health problems, source of health information and frequency of health visits. The same demographic information was collected in this study also.

Binder (1992) used the ATIG in a nonexperimental study to explore adolescents' perceptions of their interactions with HCP so that interventions could be developed to foster more collaborative relationships between HCP and adolescents. Her research questions focused on the identification of King's (1981) transaction elements found in the interactions occurring between adolescents and HCP from the adolescents' perspective and if demographic characteristics influenced the transaction process (Binder, 1992). Binder (1992) used semi-structured interviews following the ATIG with 50 randomly selected adolescents between 12 and 15 years of age, at five public middle schools in a large city in the southwestern United States. She audiotaped the interviews. The tapes were transcribed then content analyzed for statements reflecting elements of the transaction process and scored according to the strength and number of statements extracted. Intra-rater and inter-rater reliability coefficients were found to be .98 and .93 respectively. Elements of King's transaction process were found in all of the adolescents' perceptions of interactions with HCP, but all the transaction elements were found to be in only five of the 50 adolescents' perceptions. Binder (1992) found a positive relationship between the frequency of adolescent and HCP interactions and the transaction process (Spearman r=.31, p=.015).

Binder then collaborated with Stonebraker, another nurse educator, in an unpublished study entitled "Transaction and self-care agency as predictors of self-care practice among healthy and chronically ill adolescents" (Binder & Stonebraker, 1996). The purpose of this study was to investigate the relationship between adolescents' perceptions of interactions with HCP, their ability to act on their own behalf, and their health practices. Their transactions were measured with the ATIG. Outcomes of this study are still pending (personal communication, Binder, January 2000).

There are a few studies testing King's transaction as an intervention and evaluating its affect on patient outcomes. Hanna (1993) a nursing faculty member and doctoral student conducted an experimental study to test the effect of a nurse-client transactional intervention on 51 female adolescents' oral contraceptive adherence. Hanna (1993) used King's TGA as a means for an intervention to facilitate a change in the behavior of 16-18 year old adolescent females seeking oral contraceptives for the first time.

The transactional intervention was based on the elements of King's (1981) operational definition of transaction. The intervention involved the nurse and adolescent identifying perceived oral contraceptive benefits and barriers (initiate and response), identification of perceived oral contraceptive barriers as potential interference to adherence (problem mutually identified), confirming the adolescents' goal of preventing pregnancy by using oral contraceptives (mutual goal setting), and developing an oral contraceptive adherence plan to manage perceived barriers (exploration of means with agreement on means to achieve goal) (Hanna, 1993).

Subjects were assigned randomly to a control or experimental group. Both groups received the clinic's regular teaching information. The experimental group also received the transactional intervention. Hanna (1993) found significantly higher levels of oral contraceptive adherence in female adolescents who had experienced the transactional intervention (ANOVA, $F=4.15$, $p=.049$). These results supported King's (1981) theory that goals are achieved through nurse-client transactions based on perceptions. These results also support the steps or elements in King's operational definition of transaction.

Another study to test King's TGA (1981) was conducted by Froman (1995). Froman examined the specific concepts of perception and transaction from the theory. The purpose of her study was to explore the degree of perceptual congruency between clients and nurses related to the illness situation and the nursing care required. The study was designed as exploratory, correlational research at the factor-relating level of theory development. Froman's (1995) study hypothesis was, the greater the degree of perceptual congruency between nurse and client related to the illness situation and nursing care required, the greater the degree of goal attainment or satisfaction with nursing care. She explored the proposition modified from the TGA that the presence of perceptual congruency between nurse and client influences the occurrence of transaction leading to goal attainment or effective nursing care (Froman, 1995). The study was conducted on the medical and surgical units of three urban community-based hospitals. A nonprobability convenience sample of 40 matched nurse-client pairs was used. Froman used the Patient Satisfaction with Care Scale and a researcher-designed Perceptual Congruency Questionnaire as instruments for this study. Froman's results supported her

study hypothesis and proposition (Pearson r=.43, p=.003 & Spearman r=.50, p=.001). Froman concluded that successful transactions had taken place and goals attained because patient scores on the Patient Satisfaction with Care Scale were high and correlated with the nurse's scores on the Perceptual Congruency Questionnaire. No evaluation of the operational definition of transaction was done.

Kameoka (1995) did an analysis of nurse-patient interactions to identify what happens in actual nurse-patient situations. The purpose was to explore the specific factors that interfered with transactions. She used King's (1981) operational definition of transaction to analyze 19 process recordings collected by nonparticipant observation techniques on two orthopedic wards at two Japanese hospitals. The process recordings included patient's activity, nurse's activity and an interpretation of the situation. Kameoka (1995) identified three common themes that might have interfered with nurse-patient interactions leading to transactions. These were: (1) differences of perception and inadequate communication between nurse and patient, (2) one-sided (nurse-directed) nurse-patient relationships, and (3) lack of the nurse's concern for the patient and lack of special knowledge of nursing (Kameoka, 1995). Kameoka (1995) concluded when a nursing situation deviates from a normative theory, factors that contribute to the situation need to be explored and that further development of the elements of King's operational definition of transaction is needed to improve nursing care. The development of the Adolescent Transaction Scale (ATS) should help in this exploration.

Related Concept of Interaction

The concept of interaction is closely tied to transaction. It is also one of the major concepts in King's TGA. King (1981) defines interaction as "a process of perception and communication between person and environment and between person and person, represented by verbal and nonverbal behaviors that are goal-directed" (pg. 145). Since only one instrument was found that measured transaction according to King's definition, studies were reviewed that used instruments to measure interactions between HCP and patients to determine if one would be appropriate to use to measure transaction.

The Nurse Orientation System (NOS) (Diers & Schmidt, 1977) was developed to help refine the measurement of the nurse-patient interaction. Diers and Schmidt regarded the nurse-patient interaction as a treatment in itself so directions for its use needed to be specific enough to guide practice, but general enough to allow for differences in application. In order to identify or teach the elements in the nurse's approach, one must be able to describe the interaction that produced the effect. The NOS was developed specifically for nursing-practice research to quantify the dialogue between patient and nurse. Interaction analysis, the description of the content and structure of communication between people, was used to specify, quantify and communicate to others the components of different kinds of nursing processes (Diers & Schmidt, 1977).

Interaction analysis involves classifying units of verbal behavior into categories. In the NOS, the units of verbal behavior were obtained from audio tape-recorded nurse-patient interviews that were transcribed, categorized, then analyzed. In the NOS, those categories were constructed from data collected from observing seven nurses in a

Veteran's Administration hospital as they did their daily duties, and derived from communication theory. The NOS in its final form had 10 categories based on orientation. Orientation is the perceptual stance taken by one person toward the other (Diers & Schmidt, 1977). The major categories of the NOS represent the focus of orientation or to what the speaker attends. See Table 1.

Table 1. Nurse Orientation System

Category Number	Category
0	Object Orientation
	Patient Orientation:
1	Feeling
2	Knowing-thinking-evaluating
3	Being-doing
	Nurse Orientation:
4	Feeling
5	Knowing-thinking-evaluating
6	Being-doing
	Other Orientation:
7	Feeling
8	Knowing-thinking-evaluating
9	Being-doing

Diers, D.K. & Schmidt, R.L. (1977). Interaction analysis in nursing research. In P.J. Verhonick (Ed.), Nursing Research II. Boston: Little, Brown & Co., p. 92.

Orientation is a reflection of the meaning to the person who is speaking. For coding, the judgement is based on the meaning to the speaker. This is very subjective and dependent upon the coder's interpretation. Coding was done from the transcribed interview and not from the taped version, so if something on the tape was not transcribed,

it was not coded. The NOS seems to be a very confusing coding method and is based only on the nurse's perception.

The aspects of reliability of the NOS that were tested were: agreement between coders, agreement within one coder over time, effect of coding method on agreement, and effect of coder training on agreement. Before coder training, agreement between coders was about 50%. After training, there was about a 20% increase in agreement. Agreement within one coder was around 65% before training and around 80% after (Diers & Schmidt, 1977).

Face and content validity were assumed when the categories in the NOS were constructed. The authors stated tests for construct and concurrent validity were made, but results were difficult to interpret (Diers & Schmidt, 1977).

Prior to the development of the NOS, studies of nurse-patient interactions used interaction analysis instruments developed in other disciplines. Bales (1950) developed one such interaction instrument. Bales (1950), a social scientist and researcher at Howard University, developed the Interaction Process Analysis (IPA) to evaluate the process of interaction in small groups. Bales used a direct method of data collection with nonparticipant observers classifying the interaction as it happened. It is most useful in small group interactions and allows for inclusion of nonverbal behaviors. Bales uses a system of 12 observational categories that are further subdivided into three areas, four types, and six problem areas. See Table 2.

Table 2. Bales' System of Observational Categories

1.	Shows solidarity, raises other's status, give help, reward.
2.	Shows tension release, jokes, laughs, shows satisfaction.
3.	Agrees, shows passive acceptance, understands, concurs, complies.
4.	Gives suggestion, direction, implying autonomy for other.
5.	Gives opinion, evaluation, analysis, expresses feeling, wish.
6.	Gives orientation, information, repeats, clarifies, confirms.
7.	Asks for orientation, information, repetition, confirmation.
8.	Asks for opinion, evaluation, analysis, expression of feeling.
9.	Asks for suggestion, direction, possible ways of action.
10.	Disagrees, shows passive refection, formality, withholds help.
11.	Shows tension, asks for help, withdraws out of field.
12.	Shows antagonism, deflates other's status, defends or asserts self.

Bales, R. (1950). Interaction process analysis. Cambridge: Addison-Wesley Press, Inc., p. 9.

Statements 1-3 reflect a positive social-emotional area, 4-9 reflect a neutral task area, and 10-12 a negative social-emotional area. Statements 1-3 are also considered positive reactions; 4-6, attempted answers; 7-9, questions; and 10-12, negative reactions. Statements are then further divided according to problem areas. These areas are problems of communication (6 & 7), problems of evaluation (5 & 8), problems of control (4 & 9), problems of decision (3 & 10), problems of tension reduction 2 & 11), and problems of reintegration (1 & 12). Observers must be specifically trained in the use of the IPA in

order to correctly score the interaction. The underlying assumption of the IPA is of group movement toward a task accomplishment. This is similar to King's movement toward a goal, but the IPA only involves evaluation of a process from the nurses' or observers' standpoint and does not evaluate the patient's perception of the interaction.

Some nurse researchers felt that the IPA could be applied to individual nursing situations because of the social emotional categories. Conant (1965) used Bales' IPA in a nursing study to examine the development and nature of the role relationships of public health nurses and patients in home visits. Conant (1965) used tape-recorded interactions from home visits instead of direct observation and the interactions were scored from the tape recordings and transcripts by two scorers trained in IPA. Conant found the IPA was useful in differentiating verbal behavior so that relationships could be found between nurse and patient interaction patterns and variables, but found many limitations to its use in a nursing situation. One limitation of the IPA found by Conant was in scoring. Bales' categories of interaction into task and social-emotional areas were not exhaustive or mutually exclusive of one another, yet scorers had to place every act into one category (Conant, 1965). There were also problems with scorer reliability. The biggest limitation found was that content is largely excluded. For example, tension could be related to the topic under discussion rather than to the relationship of the participants (Conant, 1965). Conant also found the IPA inadequate as a measure for describing how one person responds to the behavior of another.

In summary, the NOS (Diers & Schmidt, 1977) is an indirect method of measuring the nurse-patient interaction. Tape-recorded interactions are later classified

and analyzed. Bales' IPA (1950) is a direct method where trained observers watch and classify the interaction "live". Bales' IPA evaluates the process and the NOS evaluates the content. Both methods rely on another person's evaluation of the interaction rather than the patient perception of the interaction. The ATS allows the patient to evaluate their perception of the interaction, which is a very important dimension to measure if one is to effectively evaluate nurse-patient interaction and improve communication to improve outcomes.

Measurement

The focus of measurement is to quantify characteristics of an object or concept so they can be meaningfully interpreted. It is a process of assigning symbols or numbers to objects in order to classify or scale these objects or concepts (Waltz, Strickland, & Lenz, 1991; Nunnally & Bernstein, 1994). In nursing, there are many characteristics or attributes of objects or concepts that are not easily measured and must be operationally defined in order to be measured (Waltz, Strickland, & Lenz, 1991). King's concept of transaction was operationally defined and for this study, was assigned numbers to help measure this concept in interactions between adolescents and health care providers.

Classical measurement theory assesses random measurement error and assumes that the observed score obtained in any measurement procedure is a combination of a true score and an error score (Waltz, Strickland, & Lenz, 1991). This assumption implies that systematic errors are part of the true score and affect validity but not reliability. Two models of measurement error in classical measurement theory are parallel measures and domain sampling. Domain sampling is a particularly useful model to determine true

scores (Nunnally & Bernstein, 1994) and is the appropriate model for the assessment of measurement in this study.

The domain-sampling model considers any measure to be composed of a random sample of items from a hypothetical domain of items (Waltz, Strickland, & Lenz, 1991; Nunnally & Bernstein, 1994). The assumption is that the average correlation of each item with all the other items in the domain is the same for all items. Errors that would cause variation from item to item, such as guessing, would reduce item correlations and therefore decrease reliability. It is assumed that the reliability of scores obtained on a sample of items from a specified domain would increase as the number of items increase, so theoretically, the longer the test the greater the reliability. The higher the reliability, the less the random error (Waltz, Strickland, & Lenz, 1991).

The goal of any measure in the domain-sampling model is to estimate the score a person would obtain if they were examined on all possible items within the specified domain of content (Waltz, Strickland, & Lenz, 1991; Nunnally & Bernstein, 1994). One problem in the domain-sampling model is that test items are usually composed rather than sampled from a well-defined domain (Nunnally & Bernstein, 1994). This model still usually works well in practice because the variety of items composed for a test usually has effects similar to those of actual random sampling (Nunnally & Bernstein, 1994). The ATS consists of items composed from the domain of the operational definition of transaction according to King.

Instrument Development

Before undertaking the task of instrument development, one must determine the need for such an instrument. Reineck (1991) discusses a process of locating and obtaining instruments that involves a series of decision points that is set up like an algorithm. Reineck's recommended decision points are as follows and were used in the process of developing the ATS. The first decision is to determine the conceptual or theoretical definition of the concept to be measured. This concept was determined to be King's (1981) operational definition of transaction. The second decision is measurement framework to be used in the study. A measurement framework helps guide the design and the interpretation of the measurement (Waltz, Strickland, & Lenz, 1991). The choice is between a criterion-referenced or norm-referenced framework. Criterion-referenced framework is used when the researcher wants to compare a subject's responses to a well-defined standard (Waltz, Strickland, & Lenz, 1991). There is no well-defined standard for measuring transaction. Norm-referenced measures are derived from classical measurement theory. Norm-referenced measures are used when one is interested in evaluating one subject's performance relative to the performance of other subjects in a well-defined comparison group (Waltz, Strickland, & Lenz, 1991). The ATS is considered a norm-referenced measure.

The next question is whether or not other researchers have attempted to measure the concept. As previously described, Binder (1992) attempted to measure transaction with the ATIG, but even though the instrument was reliable and probably valid, it was not feasible. It was too time consuming and subject to bias based on the interpretation of

the person classifying the interview. At this point in the algorithm, Reineck (1991) says to modify or construct an instrument. The following describes an approach to the design of a norm-referenced measure.

Defining the Construct

In order to measure a construct; it must first be defined. King (1988) interchanges construct and concept as equivalent. To King (1988, p.22), "a concept is an abstraction that provides knowledge about the essence of things...a mental image of a thing, a person, or an object." King later defines concepts as "abstract ideas that give meaning to sense perceptions, permit generalizations, and tend to be stored in memory for recall and used at a later time in new and different situations" (King, 1992, p.19). Concepts are used to organize concrete information.

In the theory of goal attainment, King defined transaction as "the valuation component of a dyadic interaction process" (1981, p. 147). King further operationally defined it so it could be measured. An operational definition of a concept provides meaning by defining that concept in terms of the observations that measure it. Its measurement is usually in the context of a particular study (Waltz, Strickland, & Lenz, 1991). King's definition and operational definition of transaction are the only ones appropriate for this study.

Item Generalization and Scaling

Instrumentation is a systematic process for developing tools and appropriate methods to measure a variable (Rempusheski, 1990). Items should be generated to elicit the behavior specified by the objective and reflect the concept as fully as possible. Each

item should be stated clearly and concisely and represent only one idea. (Waltz, Strickland, & Lenz, 1991; Burns & Grove, 1993). Reading level of participants needs to be considered and items constructed and assessed accordingly. The ATS was assessed at a fifth grade reading level according to the Fog index (Burns & Grove, 1993). A blueprint should then be developed to ensure the scale is representative of the domain of interest (Waltz, Strickland, & Lenz, 1991). In the ATS, five to six statements represented each of the six steps of the operational definition of transaction.

A summated rating scale was developed for this study. Summated rating scales, a form of self-report, are easy to construct, usually reliable, flexible, and a more precise means of measuring phenomena than questionnaires (Burns & Grove, 1993; Waltz, Strickland, & Lenz, 1991). A Likert scale is the most commonly used scale. Response choices in a Likert scale usually address agreement, evaluation, or frequency (Burns & Grove, 1993). The items on the ATS address frequency and range from never to always. In a summated scale, a score is assigned to each individual item and these individual items are summed to obtain a total score (Waltz, Strickland, & Lenz, 1991). In a norm-referenced measure, an individual participant's score would be interpreted by comparing it to other participant's scores (Waltz, Strickland, & Lenz, 1991). Approximately half of the items in an instrument should be worded negatively to reduce response bias in which a participant may tend to agree or disagree with all items (Goldstein & Herson, 1984). In the ATS, approximately a third of the total items were worded negatively to decrease response bias, and items were mixed so that there was no set pattern.

Reliability

Reliability is concerned with how consistently the measurement technique measures the concept of interest (Burns & Grove, 1993). Reliability testing is considered a measure of the amount of random error in the measurement technique. All measurement techniques contain some random error so reliability exists in degrees and is usually expressed as a form of a correlation coefficient with a 1.00 indicating perfect correlation and .00, no correlation (Burns & Grove, 1993). Reliability indicates that the results are repeatable and consistent (Ferketich, 1990). Reliability of a norm-referenced instrument is usually estimated by using test-retest, parallel form, and/or internal consistency (Waltz, Strickland, & Lenz, 1991). Internal consistency is one of the most frequently used estimates of reliability for instruments composed of a number of items. Internal consistency reliability is used when the concern is for measuring the consistency of the performance of a group of individuals across items on a single test (Waltz, Strickland, & Lenz, 1991).

Cronbach's alpha is the most preferred measure of internal consistency and was used to determine the reliability of the ATS during psychometric and pilot testing and was used in this final phase. Coefficient alpha usually provides a good estimate of reliability because sampling of content is usually the major source of measurement error for construct and because it is sensitive to the sampling of situational factors as well as item content (Nunnally & Bernstein, 1994). An alpha coefficient of .70 is considered adequate for a newly developed instrument and a coefficient of at least .80 the lowest

acceptable coefficient for a well-developed measurement tool (Nunnally, 1978; Burns & Grove, 1993).

Validity

Validity refers to the extent to which a measure achieves the purpose for which it intended or the extent to which it actually reflects the abstract construct being measured (Waltz, Strickland, & Lenz, 1991; Burns & Grove, 1993). There are three primary types of validity: content, construct, and criterion-related (Waltz, Strickland, & Lenz, 1991; Lynn, 1986). Content and construct validity were used to assess validity of the ATS in this study.

Content validity is the determination of the content representativeness of the items of an instrument. Content validity is established in a two-stage process. The first stage is a developmental stage in which domain identification, item generation, and instrument formation take place. The second stage is a judgment-quantification stage in which a specific number of experts determine that the items are content valid and that the entire instrument is content valid. Experts should number between three and ten depending on the restriction of the area of domain (Lynn, 1986). A panel of experts should have at least two reviewers who are expert in the content area to be measured and at least one expert who is knowledgeable about instrument construction (Davis, 1992). Five content experts, with four responding evaluated the original ATS and six evaluated the revised ATS. One of these was an instrumentation expert and the rest experts in the content area.

Content validity is quantified by calculating a content validity index (CVI). The actual CVI is the proportion of items that received a rating of relevant (3) or very relevant

(4) by the experts (Lynn, 1986). For new instruments, a CVI of .80 or higher is recommended (Davis, 1992).

Construct validity is assessed when the purpose is to determine the degree to which an individual possesses a trait or quality presumed to be reflected by their score on the measure (Waltz, Strickland, & Lenz, 1991). Construct validity is usually determined using (1) contrasted groups approach, (2) hypothesis testing approach, (3) the multitrait-multimethod approach, and/or (4) factor analysis (Waltz, Strickland, & Lenz, 1991). This study tested validity by factor analysis. Factor analysis has two psychometric measurement models, classic and neoclassic. The classic model contends that all measurement error is random, so all variance is unique to an individual item and not shared with any other item or factor in the instrument. The neoclassic model recognizes both random and systematic components in measurement error, which may reflect common variance that can be attributed to unmeasured or latent factors (Ferketich & Muller, 1990). The neoclassic model was used for this study.

Factor analysis is useful to assess construct validity when the investigator has designed a measure based on a conceptual framework with various dimensions or subcomponents of interest and wishes to empirically justify these dimensions or factors (Waltz, Strickland, & Lenz, 1991). Factor analysis summarizes a pattern of correlations among observed variables to reduce the large number of variables or items into a smaller number of factors or elements in order to provide an operational definition or to test a theory (Tabachnick & Fidell, 1996). The ATS is based on King's operational definition

of transaction that contains six steps or elements. Factor analysis of the ATS should show these six elements or factors.

Summary

The concept of transaction and the related concept of interaction were reviewed in terms of methods of measurement. Research related to the measurement of transaction was presented which established the practical basis and the need for the development of the ATS. The stages of instrument development based upon principles of psychometric theory, from defining item generation and scaling to defending appropriate types of reliability and validity testing were discussed. This literature review provided support for the need for the development of the ATS.

CHAPTER 3

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

This study, a continuation of prior methodological and pilot studies, further examined the reliability and validity of the Adolescent Transaction Scale (ATS) and its ability to describe and quantitatively measure operational definition of transaction in King's theory of goal attainment (TGA). Selected demographic variables were also collected in a non-random sample of adolescents. These variables were used to describe the sample and determine eligibility in the study.

Setting

The study was conducted in a large public school district in a city adjacent to a large metropolitan area in the southwestern United States. School officials chose one of the five high schools in the district.

Population and Sample

The population consisted of all adolescents, 14-17 years of age, currently attending one of the high schools in the chosen district. This district was used in one part of the pilot study and preferred to choose the school. The same school was used in the pilot and main study. The school chose the classes to participate. The sampling frame consisted of approximately 7,000-8,000 adolescents. Any English speaking and reading adolescent, male and female, that was 14-17 years old and in the 10th grade that had passive or active parental permission and agreed to participate was included. The sample

was a convenience sample. Random sampling is not necessary for factor analysis if subjects are consistent within themselves (Sandra Ferketich, personal communication, August 6, 1999).

Sample size for a factor analysis should be large enough that correlations are reliably estimated (Tabachnick & Fidell, 1996). One to two hundred are usually advisable with at least five cases for each variable and ten preferred (Polit, 1996). Ferketich recommends ten cases per variable (Personal communication, August, 6, 1999). Tabachnick and Fidell (1996) state as general rule at least 300 cases are needed for factor analysis. Approximately 800 students were given consent forms and targeted for this study in order obtain 160-320 participants to complete the ATS.

Protection of Human Subjects

The guidelines of the University of Texas-Houston, Health Center's Committee for the Protection of Human Subjects (CPHS) were followed to ensure protection of the study participants. Compliance with the rules and regulations of the Human Research Committee at Texas Woman's University (TWU) was also ensured.

Potential risks and possible discomfort were related to "test" taking anxiety and time and energy involved completing the scale. Students were administered the scale during homeroom. Approximately 20 minutes of class time was required and the students were to be told that this was not a test, but a survey to see how they perceive their interactions with their health care provider (HCP). There are no wrong answers, only their opinions, but it is very important that they respond to all the statements. Another risk was loss of confidentiality. This risk was handled by telling the student not to put

their name anywhere on the paper. A demographic data sheet and attached ATS had an identification number on each page in order to ensure inclusion criteria. No individual information was reported, only summed group data was discussed in the final report and any publications. There are no direct benefits to the participant. Information gained can be used to enhance health care providers' interactions with adolescents and improve transactions for all adolescents.

Participants were told in the consent that even if they agreed to participate, they had the right to withdraw at any time and discontinue their participation for any reason without penalty to themselves or their class grade. Parental permission was not required for participant withdrawal.

Instruments

A demographic data form (Appendix A) was attached to the front of each ATS. This form required the subject to fill in the blank their age, gender, race, grade in school, presence of a health problem, source of health information, and number of visits to a HCP over the past year. These data were used for descriptive purposes and to ensure that only adolescents 14 to 17 years of age were included.

The ATS was developed to have an objective, quantitative measure of adolescents' perceptions of their transactions with HCP. It was originally a 58-item questionnaire derived from King's (1981) elements of transaction as interpreted in Binder's ATIG (1992) and based on questions and responses obtained from the ATIG. These elements were: one member initiates behavior, the other member responds, a problem is mutually identified, goals are mutually set, there is mutual exploration of the

means to achieve the goals, and mutual movement toward the goal. The original ATS (Appendix B) consisted of statements or questions followed by a 5-point Likert scale for responses that were as follows: never (1), rarely (2), often (3), very often (4), and always (5). Each of the six elements of transaction was addressed with nine to eleven statements or questions for each element. Approximately one third of the statements and questions were worded to indicate negative transaction. Reliability was determined in the psychometric testing phase (N=10) by calculating a Cronbach's alpha. Nunnally (1978) recommended that an acceptable alpha is .70 for a new instrument and .80 for an established instrument. The alpha for the original 58 item ATS was .83.

Also in the psychometric testing phase, five content experts were identified and consulted based on their knowledge of and previous work done with King's Theory of Goal Attainment and the concept of transaction. Three of the experts also had experience working and conducting research with adolescents. Four experts completed the content validity analysis. These experts were an Assistant Professor of Nursing who had used King's theory extensively with her work with adolescents and contraceptive adherence; two nursing faculty mentors, one of whom developed the ATIG, and both of whom are currently doing research with adolescents to determine the correlation of transaction scores and self-care; and a nursing faculty member who taught nursing theory and has taught, studied, and used King's theories in her research. The fifth expert, a nursing theorist and developer of the TGA, declined to rank the instrument but provided valuable feedback on the format of the ATS and the elements of transaction. A content validity index (CVI) was calculated as percent agreement on each item as being relevant or highly

relevant to measure the concept of transaction. Overall CVI for the original 58-item ATS was .82. The experts had 100% agreement on 20 statements, 75% agreement on 34 statements, and 50% agreement on 4 statements. Lynn (1986) recommends revision or deletion of items not showing at least 80% agreement.

Based on the content experts evaluation and suggestions, comments from adolescents who participated in the psychometric testing phase, and an instrumentation expert, the ATS was revised to the current 32-item scale (Appendix C). All 100 % agreement items were retained. "How often" questions were reworded as statements and value or feeling statements were deleted. All remaining items were worded as statements. "Mom" or "Dad" statements were reworded to say "Parent" and the participants were instructed that parent could mean those persons he or she lives with and is responsible for them.

The theorist who evaluated the original ATS felt that the sixth element of the operational definition was mutual agreement on means to achieve the goal with mutual movement toward the goal and that the statements for that element be revised to reflect this change. The sixth element of the ATS and the statements to reflect this were revised as recommended.

Thirteen of the 32 items were worded to indicate negative transaction. All six elements of King's operational definition of transaction are represented with five to six items for each element. The revised ATS was written at a fifth grade level based on the FOG index (Burns & Grove, 1993). Each item was given a score ranging from 1 for "never" to 5 for "always". Negative transaction items were reversed before scoring.

Rankings on the ATS were summed to give a total transaction score. Summed Likert scores can be treated as interval level data (Burns & Grove, 1993; Munro & Page, 1993). Possible scores on the ATS range from 32 to 160. A score of 32 would indicate there is no transaction taking place and 160 that transaction takes place in all interactions with HCP.

The reliability of the revised ATS was assessed in a pilot study (n=49) using Cronbach's alpha. Cronbach's alpha for the revised ATS was .93. In the pilot study, the ATS was found to be able to discriminate between two groups with expected differences in transaction based on the presence of a chronic health problem and increased number of visits to a health care provider.

Six content experts were consulted to establish a CVI on the revised ATS. All six ranked the revised ATS. Five of the six were the same experts consulted on the original ATS. A sixth expert was added to ensure adequate response. The sixth expert was an Associate Professor of Nursing who had developed an adolescent risk-taking scale. Overall CVI was .774. All positively worded items had 82.3-100% agreement. All items with less than 80% agreement were those that indicated negative transaction.

Data Collection

Procedure

After obtaining appropriate approvals from the University of Texas Houston Health Science Center Committee for the Protection of Human Subjects (UT-HHSC CPHS) (Appendix D), the Human Subjects Review Committee at Texas Woman's University (TWU) (Appendix E), and the school (Appendix F), a convenience sample of

adolescents were asked to participate through the homeroom teachers. Detailed information regarding the study was shared with all homeroom teachers. They were asked to read the information explaining the study to their classes and distribute a parent information sheet to be sent home prior to the study. This information sheet described the study, risks and benefits, and that in one to two weeks a permission form would be sent home with each student. This permission form again described the study and requested that if the parent did not wish their child to participate, they should sign as such and return the form to their child's teacher by the designated date. A phone number was included for questions. The form stated that if it was not returned to the teacher by the designated date, then passive consent would be assumed and their child allowed to participate in the study if the child desired. Forms were collected for two weeks. Teachers were asked to collect and remind the students daily. Adolescents with parental permission either passive or active were asked to sign a consent form stating that they agreed to participate in the study. All consenting adolescents were then allowed to fill out the demographic data sheet and the ATS in homeroom class. Not all adolescents that completed the ATS signed a consent form. Consent was assumed because they voluntarily filled out the forms. The process took about 20 minutes of class time. Those students not participating did other activities at the discretion of the teacher. Teachers were asked to administer the ATS on the same day in all participating classes and consent and ATS forms were collected by the researcher the next day.

Pilot Study

One pilot study was conducted to determine the reliability of the revised ATS and its ability to discriminate between two groups of adolescents with suspected differences in transaction with HCPs. A nonexperimental descriptive comparative design was used.

To estimate sample size for the pilot study, a one-tailed alpha was set at 0.05, power at 0.80, and effect size at 0.3, a low to medium effect size for a t-test. Estimation of effect was low medium due to the fact that there were no means or standard deviations established for the ATS in the two groups even though a significant difference was expected. It is better to estimate a low effect to ensure an adequate sample than to overestimate the expected magnitude of the findings (Pedhazuer & Schmelkin, 1991). The pilot sample size was set to include at least 10% of the estimated size for the major study, so a minimum of 14 subjects was included in each group.

Subjects included a convenience sample (n=49) of adolescents 12 to 15 years old in two different settings. One setting was an outpatient clinic of a large metropolitan children's hospital for children being treated for cancer or hematological diseases. Subjects with a known chronic illness were enrolled in this group until the fourteen required was reached. The second setting was two ninth grade classes in a large suburban public school district. All eligible adolescents were included in this group. Eligibility was determined by reviewing the demographic data sheet and excluding those who indicated they had a chronic health problem or more than five visits to a HCP in the past year or were not 12-15 years old. This review resulted in 35 "well" adolescents in the second group.

Of the total sample, 39% were boys (n=19) and 61% were girls (n=30). Mean age of all participants was 14.16 years (S.D.=. 92). The chronic group (M=13.36 years) was slightly younger than the well group (M=14.49 years). The majority of subjects (65.3%) were in the ninth grade (n=32).

Only eight of the 14 subjects in the chronic group indicated they had a health problem. For total participants, race was fairly evenly distributed with White 32.7% (n=16), Black 12.2% (n=6), Hispanic 34.7% (n=17), and other, predominately Indian and Asian, 20.4% (n=10).

Reliability was determined by calculating a Cronbach's alpha. For the revised ATS, the alpha was .93. The ATS was able to discriminate between the two groups with suspected differences in transaction because of differences in the amount of contact with HCP. The chronic group had significantly more visits to a HCP over the past year than the well group (one-tailed t-test, t=3.710, p=. 0015, df=14.85). The chronic group had a mean of 34.43 visits (S.D.=32.16) as compared to the well group with a mean of 2.51 visits (S.D.=2.33).

Rankings on the ATS were summed for a total transaction score. Negative transaction items were reverse scored then summed. Possible scores on the ATS ranged from 32 to 160. Mean ATS score for the chronic group was 109.50 (S.D.=23.26). Mean ATS score for the well group was 95.43 (S.D.=23.43). The ATS scores were significantly higher in the chronic group than those in the well group (one-tailed t-test, t=1.903, p=.03, df=47).

The pilot and methodological studies were done with adolescents 12 to 15 years of age to be consistent with the ages used by Binder in her ATIG studies (1992). It was found that the younger adolescents, ages 12 and 13, took much longer to complete the scale and had more questions. Wong (1995) divides adolescence into early, 11 to 14 years, and middle, 14 to 17 years. Since the original age group 12 to 15 years, spanned two groups of adolescents, and the younger ones had more difficulty, it was decided to change the inclusion ages to those adolescents 14 to 17 years of age for this study to have a more homogeneous group.

The question about having a health problem on the demographic data sheet was changed due to difficulty with adolescents with known chronic illness answering "no". The original wording was as follows: "Do you have any health problems? (A health problem is anything you think is a health problem, such as cancer, asthma, diabetes, heart problems, etc.)" It was felt by experts caring for these adolescents that when they were in remission or felt good, they did not think they had a health problem. The marking of "no" could also be an attempt on the adolescent's part to be normal, or not different from others. The question was reworded to say: "Do you have any chronic health problems such as cancer, asthma, diabetes, heart problems, blood problems, bone problems, etc.?" The wording of this question did not seem to be a problem since they were also asked the number of times they had seen a doctor or nurse in the past 12 months and this number is a better indicator of a chronic health problem.

In summary, the pilot study showed that the revised ATS had adequate reliability and was able to discriminate between two groups with suspected differences in

transaction. The revised ATS was used in the final study. The demographic data sheet was revised as indicated above.

Treatment of Data

Demographic data are described using percentages and frequencies for nominal data, and means, standard deviations, and ranges for interval/ratio level data. Internal consistency reliability was determined by calculating a Cronbach's alpha.

An exploratory factor analysis in the neoclassical model was used to test the construct validity of the ATS. A neoclassical model recognizes both a random component and a systematic component in measurement error that may reflect common variance that can be attributed to unmeasured or latent factors (Ferketich & Muller, 1990). Common factor analysis follows from the neoclassic model. Principal axes factoring with varimax orthogonal rotation was used. Principal axes factoring is the most frequently used common factor approach (Ferketich & Muller, 1990).

Common factor analysis organizes the underlying structure of the data and recognizes random and systematic measurement error. Therefore, each variable is affected by common factor variance, unique variance, and distortion caused by random error (Ferketich & Muller, 1990). The common factor approach for factor extraction is used because all variance is not accounted for by each item in this model. Principal axes factoring places the squared multiple correlations on the main diagonal. The squared multiple correlations best operationalizes the theoretical stance that items have a shared common underlying structure (Ferketich & Muller, 1990). In principal axes factoring, the first axis (factor) extracted accounts for the greatest amount of common variance among

the variables. The variance is partitioned from the matrix and the second axis (factor) is extracted. This continues until the preset eigen value is reached. The eigen value is the sum of the squared correlations of each variable with a factor and identifies the amount of variance explained by that factor (Ferketich & Muller, 1990). Factors with an eigen value of one or less are considered nontrivial and this value was used in this study.

The extracted factors were orthogonally rotated so they were easier to identify and interpret. Orthogonal rotation is based on the assumption that the factors are uncorrelated and a ninety-degree angle is maintained by the axes to describe the factor's location (Ferketich & Muller, 1990). The most frequently used orthogonal rotation is varimax rotation. It maximizes the sum of the variables of the squared loadings in the factor matrix and has its advantage that the extracted factors have a greater number of items that load only on those factors (Ferketich & Muller, 1990).

Each of the 32 items was a variable. Factors were identified as those with eigen values of one or higher. Items with correlation coefficients .45 or higher loaded on to each factor. A basic requirement of factor analysis is that there should be a number of sizable correlations between the variables in the matrix. The higher the loading, the more the item is a pure measure of the factor (Tabachnick & Fidell, 1996). If the correlation matrix mainly consists of correlation coefficients with an absolute value less than .30, there is probably nothing to factor analyze (Polit, 1996; Tabachnick & Fidell, 1996). As a rule of thumb, only variables with loadings of .32 and above are interpreted (Tabachnick & Fidell, 1996). Comrey and Lee (1992) suggest an even more detailed method of determining the size of loadings. They state that loadings over .71 are excellent, .63 are

very good, .55 are good, .45 are fair, and .32 poor (Comrey & Lee, 1992). Choice of the cutoff for size of loading to be interpreted is up to the researcher's preference; however, setting the size too low may complicate determining factors if it allows items to load on more than one factor. If homogeneity is suspected, interpretation of lower loadings may be warranted (Tabachnick & Fidell, 1996). Homogeneity was suspected so a lower cutoff point of .45 worked well for this study.

Summary

This methodological study was conducted to determine the psychometric characteristics of the ATS. A convenience sample of 320 adolescents aged 14 to 17 responded to the ATS. Demographic data were collected to describe the sample and ensure inclusion criteria. Internal consistency reliability was assessed using a Cronbach's alpha and construct validity was determined using an exploratory factor analysis to further assess the ATS based on King's TGA.

CHAPTER 4

ANALYSIS OF DATA

This methodological study focused on the continued analysis of the reliability and validity of the Adolescent Transaction Scale (ATS). Demographic data are used to describe the sample. Reliability testing of the ATS involved the use of Cronbach's alpha to estimate internal consistency reliability. Factor analysis was used to estimate construct validity. The procedures, initial findings, revisions and final results are described in this chapter. Findings are discussed according to the research questions and summarized in the final section.

Description of Sample

The sample for this study consisted of 250 male and female adolescents between the ages of 15 to 17 years of age, in 10th grade homerooms at the chosen high school in a large suburban school district in the southwestern United States. Twenty-two of 28 homerooms participated. Although there were 262 respondents, twelve surveys could not be used because the respondents did not meet the inclusion criteria or failed to respond to two or more statements on the ATS. The sample was predominately Hispanic (69.9%, $\underline{n}$=174), 16 years old (54%, $\underline{n}$=135), with males and females fairly equally participating. The majority of students did not have a chronic health problem (89.2%, $\underline{n}$=223) and the mean number of visits to a health care provider in the past year was 2.7 visits (S.D. 2.61). More than half of the students listed their doctor as their primary source of health information. Demographic data about the respondents are presented in Table 3.

Table 3. Demographic Information for the Adolescent Research Sample

VARIABLE	FREQUENCY	PERCENT
Age		
15	82	32.8
16	135	54.0
17	33	13.2
Gender		
Male	107	43.3
Female	140	56.0
Race		
White	46	18.4
Black	11	4.4
Hispanic	174	69.6
Other	19	7.6
Chronic Health Problem		
Yes	25	10.0
No	223	89.9
Source of Health Information		
Doctor	126	50.4
Parent	68	27.2
No one	16	6.4
Nurse	6	2.4
Teacher	6	2.4
Peers	4	1.6
Other	4	1.6
Anyone	2	.8
Sibling	1	.4

Adolescents had varied responses to the question regarding whom they talked to if they needed information about their health. Many students listed several answers, but only the first answer was recorded. The doctor was listed as the primary source of health information by half of the participants. Approximately one fourth of the students listed

parents as their primary source of information. (Table 3). The parent category also included grandparents, uncles, and aunts. The teacher category included coaches and trainers also. Neighbors, specific names, the Internet and books were included in the other category.

Findings

The purpose of this study was to further examine the reliability and validity of the ATS. The first research question was: Does the ATS demonstrate acceptable internal-consistency reliability (Cronbach's alpha $\geq .80$)?

Initially a Cronbach's alpha was done for the 32-item scale and was .8210. The following items had corrected item to total correlation of less than 0.3. Ferketich (1991) suggests that items with low inter-item correlations fail to contribute to the reliability and should be considered for removal. These items were 5, 7, 8, 9, 10, 11, 14, 18, 20, 23, 24, 25, 28, and 32.

In a second step following factor analysis, the scale was reduced to 26 items. Reliability on the 26-item scale was .8407. Of these items, number 7 as well as the rest of the remaining items that indicated negative transaction were poorly correlated to the remaining scale items. These items were considered for removal. Following further analysis, the ATS was reduced to 18 items. Reliability on the 18-item scale was .9231. Further analysis of this 18-item scale further reduced the ATS to 16 items that all had corrected item to total correlations greater than 0.3 and a Cronbach's alpha of .9226.

The second research question asked was: Do all items of the ATS interrelate in measuring the concept of transaction (construct validity/factor analysis)? A factor analysis using principal axis factoring with orthogonal varimax rotation was done using preset parameters for the total 32-item scale. Prior to analysis missing values on the ATS were replaced with the variable mean. The data were reduced using SPSS analysis and converged after nine iterations with Kaiser normalization. Initial results revealed six factors with eigen values of greater than one. After extraction and rotation, these six factors accounted for 49.2% of the total variance. In order for an item to be considered to load on a factor, a factor loading of 0.45 needed to be achieved. Six items, five of which were negatively worded, did not load on any of the factors at the prespecified level. All the remaining items loaded on only one factor. The results of the factor analysis with loading values and original element that they represented are listed in Table 4. Statements that indicate negative transaction item numbers are underlined.

The ATS was based on the following elements of Imogene King's operational definition of transaction: One member initiates (I), another member responds (R), a problem is mutually identified (PI), goals are mutually set (GS), means to achieve the goals are mutually explored (ME), and there is mutual agreement on the means to achieve the goals with movement toward the goals (MTG) (King, 1981). These abbreviations will be used in Table 4 to indicate what element each item represents.

Table 4. Principal Axis Factoring with Orthogonal Varimax Rotation (32-item scale)

FACTOR/ITEM		ELEMENT	FACTOR LOADING
Factor 1			
Item	30	R	.677
	21	I	.672
	6	GS	.644
	3	R	.642
	2	I	.604
	12	I	.603
	15	MTG	.593
	4	PI	.501
	31	R	.481
	1	I	.468
Factor 2			
Item	17	MTG	.801
	19	GS	.728
	26	MTG	.691
	29	ME	.670
	16	ME	.665
	13	PI	.495
Factor 3			
Item	24	GS	.699
	23	ME	.678
	32	ME	.613
Factor 4			
Item	20	R	.735
	11	R	.717
	9	I	.499
	25	PI	.461
Factor 5			
Item	7	MTG	.752
Factor 6			
Item	27	ME	.550
	22	PI	.502

I=Initiate R=Respond PI=Problem Identified
GS=Goals set ME=Means Explored MTG=Agreement with movement toward goals

To further reduce the data, another factor analysis using principal axis factoring and orthogonal varimax rotation was done with the remaining 26 items. Rotation converged after eight iterations and resulted in 25 items loading on five factors and accounted for 51.6% of the variance. Item 7 failed to load on any on the five factors. It was also noted that all the remaining items indicating negative transaction still had very poor correlations. These items were removed and another factor analysis on the remaining 18 items was completed. Rotation converged after eight iterations and resulted in 16 items that each loaded on only one of three factors and accounted for 51.9% of the variance. The results are in Table 5.

To answer research question two, all the items of the 32-item ATS did not interrelate in measuring the concept of transaction; however, the remaining 16 items do interrelate and load onto the three factors. These items will provide a strong core from which to continue instrument development.

To assess the internal consistency of the three factors identified, a Cronbach's alpha was calculated for each factor. The results are in Table 6. Findings indicated that each of the final factors possessed an adequate level of internal consistency.

Table 5. Revised ATS with Factors, Items and Loadings (18-item scale)

FACTOR/ITEM	FACTOR LOADING
FACTOR 1 Means Explored and Movement Toward Goals	
17. My nurse and I agree o how to fix my problems. (MTG)	.808
19. The nurse and I decide together what we want to happen with my health. (GS)	.755
26. My nurse and I agree on how to work toward my health goals. (MTG)	.724
29. The nurse works with me to decide the best way to meet my health goals. (ME)	.702
16. I get to help the nurse decide what to do to make me better. (ME)	.688
13. I work with the nurse to decide what is wrong with me. (PI)	.566
FACTOR 2 Initiate and Respond	
30. I get to answer questions the nurse asks. (R)	.650
2. The nurse asks me questions. (I)	.645
21. I tell the doctor what I am worried about. (I)	.586
12. I tell the nurse what I am worried about. (I)	.574
3. I answer the doctor's questions. (R)	.567
6. The doctor works with me to make plans for my health. (GS)	.522
FACTOR 3 Problems Identified	
27. I work with the doctor to decide what needs to be done to make me well. (ME)	.666
4. I work with the doctor to decide what is wrong with me. (PI)	.606
22. I help the doctor decide what has made me sick. (PI)	.496
15. My doctor and I agree on the best way to meet my health goals. (MTG)	.451

Table 6. Cronbach's Alpha Reliability of Three Factor Scale

FACTOR	*N* ITEMS	ALPHA
1	6	.8446
2	6	.8979
3	3	.7870
Total Instrument	25	.9226

Summary of Findings

The results of the study indicate an acceptable level of internal consistency-reliability for the entire ATS both before and after revision. The alphas of the remaining three factors are acceptable for a new instrument as they are all greater than .70 (Nunnally, 1978).

Twenty-six items loaded onto six factors. These were further reduced to 25 items on five factors, but inter-item correlations were not adequate for the items indicating negative transaction. These items were removed and the remaining 18 items factored into three factors resulting in the final 16-item instrument. Although the factors were not entirely consistent with the six elements in King's operational definition of transaction, the three-factor solution provided the greatest congruency with the theoretical concepts. These findings are discussed further in Chapter 5.

CHAPTER 5

SUMMARY OF THE STUDY

The purpose of the study was to psychometrically test the Adolescent Transaction Scale (ATS), a newly developed instrument to measure adolescents' assessments of interactions with health care providers (HCP). Psychometric testing of the ATS was done by examining internal consistency reliability and construct validity. In this chapter, the study will be summarized and findings discussed with meanings extrapolated related to the theory and literature review. Conclusions, implications and suggested use of outcomes, and recommendations for further study are included.

Summary

The ATS was developed to have an objective means to measure adolescents' perceptions of their interactions with HCP. The literature review had revealed only one interview instrument available to measure adolescent's perceptions of transactions with health care providers based on Imogene King's operational definition of transaction. The conceptual framework was provided by King's theory of goal attainment (TGA) and further by her operational definition of transaction. Items addressing six elements in King's operational definition of transaction were developed. These elements are: One member initiates, another member responds, a problem is mutually identified, goals are mutually set, means to achieve the goals are mutually explored, and there is mutual agreement on the means to achieve the goals with movement toward the goals. Items

were formatted as numerical rating scales (Likert scale). The ATS was initially psychometrically tested with a group of chronically ill 12-15 year olds and based on reliability, content validity, instrument development experts recommendations, and participant comments, was revised to the current 32-item instrument. A pilot study was done using the revised ATS to determine reliability, validity, and its ability to discriminate between two groups with suspected differences in transaction. Initial content validity and reliability were promising. It was determined that the younger adolescents had more difficulty and took more time to fill out the ATS. Following the pilot study, a decision was made to change the ages of the participants to 14-17 to have a more homogeneous group of middle adolescents. The current study was done to further refine the ATS by doing further psychometric testing with middle adolescents.

Instruction and study information packets were distributed to 28 tenth grade homeroom teachers at the designated school after discussion with and permission by administration. Parent information fliers were followed a week later with parental permission forms sent home via the students. Nineteen parent permission forms were returned with five stating they did not want their child to participate and 14 stating that yes they could participate. Implied consent was assumed for those who did not return forms by the designated date. Over 800 adolescent consent forms, ATS and demographic forms were distributed to 28 tenth grade homeroom teachers to administer to their classes. Consents and surveys were completed over a two-day period. Twenty-two of the 28 homerooms returned completed surveys and consents. Of the 262 returned surveys,

250 were complete and usable. Twelve could not be used due to more than two items on the ATS missing or were the wrong age or grade. Only 187 teenager consent forms were returned. Agreement to participate was assumed on the remainder due to them completing the survey.

The surveys were coded, entered into a data set and statistically analyzed using SPSS computer program for reliability and factor analysis for estimation of internal consistency reliability and factorial validity. Internal consistency of the instrument was determined using Cronbach's alpha. Demographic statistics were used to describe the sample and ensure inclusion criteria.

Research question one, relative to internal-consistency reliability was supported. The Cronbach's alpha of the 32-item instrument was .8210, above the acceptable value of .80. Cronbach's alpha on the revised 16-item instrument after factor analysis was .9226. The second research question partially supported. Six of the 32 items did not load on any factor at the .45 cutoff level. Five of the six items were written to denote negative transaction. Further factor analysis of the remaining 26 items resulted in 25 items that loaded on 5 factors. The seven remaining negative transaction items all loaded on factors 3 and 4 and had poor inter-item correlations. It was decided to remove these items and factor analysis was done on the remaining 18 items. This analysis resulted in 16 items that loaded on three factors.

Because King has six elements in her definition of transaction, it was expected that the items would load on to these six elements. Two sets of elements that were felt to

be closely related did load somewhat on the same factors. Most means explored and movement toward goals loaded on factor 1. Most initiate and respond items loaded on factor 2. Factor 3 consisted mostly of problem identified items. Five of King's six elements were represented by the three factors. Goal setting items loaded on both factors 1 and 2. Each element was represented by two or three items in the final 16-item instrument.

Discussion of Findings

The findings of the study are discussed in relation to reliability and validity. Most of the discussion will focus on validity and how the factors aligned with King's operational definition of transaction. Demographic data are discussed initially in relation to outcomes of the study.

Demographic Considerations

Student participation was much lower than anticipated. It was expected that by using implied parental permission, more students would be available to participate. Five to ten subjects per item were needed with the ideal of ten per item expected due to the large number of potential subjects. It was also expected that all homerooms would participate; however, six did not. Having to communicate with the homeroom teachers via the assistant principal and letters in their boxes was not ideal, but was the only method allowed by the school. If teachers did not wish to participate, they may not have given their students the opportunity to participate. It is not known if the study was discussed with all the potential participants by all the teachers.

The demographic breakdown of race was expected to have a large number of Hispanic students, but it was not anticipated to be 69.6% (n=174). However, there did not seem to be any problems with students reading and completing the form in English. Only 10% (n=25) of the participants had a chronic health problem and all participants only averaged 2.7 visits to health care providers in the past year. It was discovered in the pilot study that adolescents that had five or more visits to a HCP in the past year had significantly higher transaction scores. This decreased contact with may interfere with adolescents' ability to refine their interactions with HCP.

The biggest surprise was that over 50% (n=126) of the students listed their doctor as their primary source of health information and only 2.4% (n=6) listed nurses. Nurses consider health education as an important aspect of their role, but were not perceived that way by this sample. Possibly due to the few numbers of health visits, they were most likely occurring an outpatient setting. In this setting, the nurse may be seen only as the person who checks them in and asks why they are there and the doctor or health care provider is viewed as the person with the answers. The health care provider could have been a nurse practitioner but since was seen in the traditional role of the doctor, was classified as such by the students.

Reliability

Reliability outcomes were very good for a new instrument. More items usually increases the reliability and the Cronbach's alpha, but in this study it was the opposite. The 32-item instrument had an acceptable reliability with an alpha of .8210, but the

revised 16-item instrument had a much better reliability with an alpha of .9226. This outcome was most likely due to the removal of all items with corrected inter-item correlations of less than 0.3. Removal of items with corrected inter-item correlations of less than 0.3 reduced the number of items not related to the scale. One explanation is that the items not supporting successful transaction were too subtle to differentiate in terms of transaction. Even though seven of the 13 items that indicated negative or unsuccessful transaction survived the first two factor analyses, they had very poor inter-item correlations and when they were deleted, the reliability improved significantly.

Validity

Ideally it was hoped that all 32 items would load on to six factors according to King's six elements of transaction. It was anticipated that these items representing the six elements might load onto three factors because of pairing of similar elements. Initiate and respond go together as do problem identified and goals set, and means explored and agreement on means with movement toward the goal. In the initial factor analysis, six items did not load on any factor. Five of these were items indicating negative transaction. The remaining 26 items loaded on to six factors but did not load according to King's elements. In this initial analysis, initiate and respond items fell mostly in factors 1 and 4, those indicating positive transaction in 1 and those indicating negative transaction in 4. Factor 2 consisted mostly of means explored and movement toward the goal. Factor 3 also contained all negative transaction items and was predominantly means explored. Factor 5 consisted of only one negative transaction item representing movement toward

the goal. Factor 6 had two items, one representing means explored and one, problem identified.

One reason for the nature of the factor loading is that traditional roles may have intruded. Items seemed to load according to transaction player instead of element of transaction. Also, the items indicating negative transaction may have been too subtle and not easily understood and these tended to load together. For example, factor 1 had all I and me items. Factor 2 was all nurse items. Items in factor 3 all contained the word goal and were negative transaction items. Factor 4 also contained all negative transaction items and all had the word parents as the noun. Factor 5 had only one negative transaction item. In factor 6, both items involved the doctor and I.

Factor analysis on the remaining 26 items resulted in 25 items loading on 5 factors very similar to the first analysis. The original factor 5 with one item was eliminated because that item did not load. Item 4 moved from original factor 1 to original factor 6. This analysis did not add to the clarity or interpretability of the results. After reviewing the inter-item correlations, it was decided to delete all remaining negative transaction items and run another analysis on the remaining 18 items. This resulted in the final 16 items loading on three factors.

The remaining three factors account for five of King's six elements. Those elements felt initially to be related factored together fairly well. Two means explored and two movement toward goal items loaded together on factor 1. Initiate and respond items all loaded on factor 2. Two problem identified items loaded on factor 3 as did one means

explored and one movement toward goal item. One problem identified item also loaded on factor 1. The only element from King's operational definition that did not fall clearly into one factor was goals set. Of the two remaining goals set items, one loaded on factor 1 and one on factor 2. This outcome could be due to the items not being clearly understood or that adolescents do not understand the concept of setting goals mutually because it is so infrequently done in health care. It could also be because that element is only represented by two items.

All items that did not load in addition to all the items indicating negative transaction will be deleted. The remaining 16 items will work together as a core to measure the concept of transaction. More items for each of the six elements may need to be added to further refine the instrument.

Conclusions

Based on the study findings, the following conclusions are offered:

1. The 16-item version of the ATS has excellent reliability.
2. The ATS provides an objective means to measure transaction.
3. Five of King's six elements of transaction are supported by this study and are represented in the ATS.
4. The remaining 16 items represent a strong core to measure transaction according to King's operational definition of transaction.

Implications

The implications for health care practice, based on the conclusions of this study are as follows:

1. The ATS is usable as an evaluation of nurse-adolescent transaction.

2. Goal setting is not well represented in the ATS and more items need to be added to represent and clarify this element.

3. Person listed in item may need to be more neutral, such as HCP instead of doctor or nurse.

4. Items representing negative transaction should not be used with adolescents or changed to less subtle statements.

5. Health care providers need to be aware of and use King's transactional elements in interactions with adolescents to improve mutual goal setting and attainment.

Recommendations for Further Study

The following recommendation for further study are proposed based on the present study:

1. Replicate the current study using the 16-item scale with a different group of 14-17 year olds in a setting where the researcher can explain procedures to the participants directly.

2. Reevaluate goal setting items and add more to the remaining 16-item survey and do another study to determine reliability and construct and content validity.

3. Consider making items player neutral using HCP instead of doctor or nurse and revise accordingly before doing another study.

4. Administer the revised ATS after perfected to a group of adolescents before and after a transactional intervention to see if scores improve significantly to further support King's operational definition of transaction.

Instrument development is a challenging process and requires a great deal of effort. The ATS shows promise in objectively measuring adolescent's perceptions of transactions with health care providers and supporting King's operational definition of transaction. Communication with this population is imperative to improve health outcomes. The ATS is needed to help determine where problems with interactions with adolescents exist so that positive health outcomes can be ensured.

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APPENDIX A

Demographic Data Sheet

Demographic Data Sheet Study Code #___

Please answer the following questions about yourself.

1. What is your age? _____(Years)

   What is your birth date (month, day & year you were born) __/__/__

2. What is your sex? ___ Male
   ___ Female

3. What is your race?

   ___ White
   ___ Black
   ___ Hispanic
   ___ Other

4. What grade are you in school? (Fill in the number of your grade in school)

   _____ Grade

5. Do you have any chronic health problems such as cancer, asthma, diabetes, heart problems, blood problems, bone problems, etc.)?

   ___ Yes
   ___ No

   If yes, please describe_____

   _____

6. Who do you talk to if you need information about your health?

   _____

7. How often have you seen a doctor or nurse for a check up or illness or injury during the past 12 months?

   ___ Times

dds9/27/00

APPENDIX B

Original Adolescent Transaction Scale

Study Code # ____

ADOLESCENT TRANSACTION SCALE

This form is going to ask you some questions about what you do when you visit the doctor. There are no right or wrong answers. This is not a test. Do not put your name on the paper. I am very interested in what you think. Please answer each question by circling the answer that best fits what you think.

1. How often do you get to tell the doctor what is important to you about your health?

   Never Rarely Often Very Often Always

2. The nurse asks the questions.

   Never Rarely Often Very Often Always

3. I answer the doctor's questions.

   Never Rarely Often Very Often Always

4. I work with the doctor to decide what is wrong with me.

   Never Rarely Often Very Often Always

5. The doctor works with my mom decide what they want to happen with my health.

   Never Rarely Often Very Often Always

6. The doctor works with me to make plans for my health.

   Never Rarely Often Very Often Always

7. I do my own thing and my doctor does his.

   Never Rarely Often Very Often Always

8. The nurse works with me to decide what needs to be done to get me well.

   Never Rarely Often Very Often Always

9. The doctor tells me what has made me sick without asking me what I think.

   Never Rarely Often Very Often Always

Study Code # ___

10. My mom asks questions when I go to the doctor.

Never Rarely Often Very Often Always

11. The nurse answers my questions.

Never Rarely Often Very Often Always

12. I make the plans about my health without help from anyone.

Never Rarely Often Very Often Always

13. I decide what to do to keep me healthy.

Never Rarely Often Very Often Always

14. I think I should accept what my doctor decides without question.

Never Rarely Often Very Often Always

15. My dad answers the doctor's questions.

Never Rarely Often Very Often Always

16. I want to be allowed to ask questions of the doctor or nurse.

Never Rarely Often Very Often Always

17. I tell the nurse what I am worried about.

Never Rarely Often Very Often Always

18. How often do you get to answer the questions that the doctor asks?

Never Rarely Often Very Often Always

19. I work with the nurse to decide what is wrong with me.

Never Rarely Often Very Often Always

20. The doctor makes the plans for my health.

Never Rarely Often Very Often Always

21. My doctor doesn't care if I can't do something he asks me to do.

Never Rarely Often Very Often Always

22. It is important to me to work with my doctor to meet my health plans.

Never Rarely Often Very Often Always

23. My dad asks questions when I go to the doctor.

Never Rarely Often Very Often Always

24. Answering the doctor's questions is a waste of time.

Never Rarely Often Very Often Always

25. How often do you help the nurse decide what has made you sick?

Never Rarely Often Very Often Always

26. My dad works with the doctor to decide what they want to happen with my health.

Never Rarely Often Very Often Always

27. I get to help the nurse decide what to do to make me better.

Never Rarely Often Very Often Always

28. I do what the doctor tells me to do.

Never Rarely Often Very Often Always

29. The doctor decides what needs to be done to help me stay well.

Never Rarely Often Very Often Always

30. It is important that I work with my nurse to fix problems.

Never Rarely Often Very Often Always

31. The doctor can decide what is wrong with me without my help.

Never Rarely Often Very Often Always

32. The nurse and I make plans (goals) for my health.

Never Rarely Often Very Often Always

33. I want to work with my doctor to meet my health goals.

Never Rarely Often Very Often Always

34. The doctor asks all the questions.

Never Rarely Often Very Often Always

35. My mom answers the doctor's questions.

Never Rarely Often Very Often Always

36. The nurse can decide what is wrong with me without my help.

Never Rarely Often Very Often Always

37. The nurse and I decide together what we want to happen with my health.

Never Rarely Often Very Often Always

38. I get to help the doctor decide what to do to make me better.

Never Rarely Often Very Often Always

39. I do what the nurse tells me to do.

Never Rarely Often Very Often Always

40. I feel OK asking my doctor questions.

Never Rarely Often Very Often Always

41. My mom answers the nurse's questions.

Never Rarely Often Very Often Always

42. I tell the doctor what I am worried about.

Never Rarely Often Very Often Always

43. How often do you help the doctor decide what has made you sick?

Never Rarely Often Very Often Always

44. The nurse makes the goals.

Never Rarely Often Very Often Always

45. The doctor decides how I will reach my health goals without my help.

Never Rarely Often Very Often Always

46. Asking the nurse questions is a waste of time.

Never Rarely Often Very Often Always

47. How often does your father help the doctor decide what made you sick?

Never Rarely Often Very Often Always

48. I feel that I can tell my nurse if I can't do something she asks me to do.

Never Rarely Often Very Often Always

49. I want to work toward health goals with my nurse.

Never Rarely Often Very Often Always

50. I work with the doctor to decide what needs to be done to make me well.

Never Rarely Often Very Often Always

51. I do my own thing and the nurse does hers.

Never Rarely Often Very Often Always

52. The nurse works with me to decide the best way to meet my health goals.

Never Rarely Often Very Often Always

53. How often do you get to answer questions the nurse asks?

Never Rarely Often Very Often Always

54. Asking questions of the doctor is a waste of time.

Never Rarely Often Very Often Always

Study Code # ____

55. How often does you mom help the doctor decide what has made you sick?

Never Rarely Often Very Often Always

56. The doctor answers my questions.

Never Rarely Often Very Often Always

57. My doctor works with me to decide what we want to happen with my health.

Never Rarely Often Very Often Always

58. The nurse decides how I will reach my health goals without my help.

Never Rarely Often Very Often Always

APPENDIX C

Revised Adolescent Transaction Scale

ADOLESCENT TRANSACTION SCALE

Study Code #___

This form is going to ask you some questions about what you do when you visit the doctor or nurse. There are no right or wrong answers. This is not a test. Do not put your name on the paper. I am very interested in what you think. Please answer each question by circling the answer that best fits what you think. Parent can mean mom, dad, or anyone whom you live with and takes care of your needs.

1. I get to tell the doctor what is important to me about my health.

   Never Rarely Often Very Often Always

2. The nurse asks me questions.

   Never Rarely Often Very Often Always

3. I answer the doctor's questions.

   Never Rarely Often Very Often Always

4. I work with the doctor to decide what is wrong with me.

   Never Rarely Often Very Often Always

5. The doctor works only with my parents to decide what they want to happen with my health.

   Never Rarely Often Very Often Always

6. The doctor works with me to make plans for my health.

   Never Rarely Often Very Often Always

7. I do my own thing and my doctor does his or hers.

   Never Rarely Often Very Often Always

8. The doctor tells me what has made me sick without asking me what I think.

   Never Rarely Often Very Often Always

9. My parents ask all the questions when I go to the doctor.

   Never Rarely Often Very Often Always

10. The nurse answers my questions.

    Never Rarely Often Very Often Always

Study Code #___

.11. My parents answer all the doctor's questions.

Never Rarely Often Very Often Always

12. I tell the nurse what I am worried about.

Never Rarely Often Very Often Always

13. I work with the nurse to decide what is wrong with me.

Never Rarely Often Very Often Always

14. The doctor makes all the plans for my health.

Never Rarely Often Very Often Always

15. My doctor and I agree on the best way to meet my health goals.

Never Rarely Often Very Often Always

16. I get to help the nurse decide what to do to make me better.

Never Rarely Often Very Often Always

17. My nurse and I agree on how to fix my problems.

Never Rarely Often Very Often Always

18. The doctor asks all the questions.

Never Rarely Often Very Often Always

19. The nurse and I decide together what we want to happen with my health.

Never Rarely Often Very Often Always

20. My parents answer the nurse's questions.

Never Rarely Often Very Often Always

21. I tell the doctor what I am worried about.

Never Rarely Often Very Often Always

Study Code #___

22. I help the doctor decide what has made me sick.

Never Rarely Often Very Often Always

23. The doctor decides how I will reach my health goals without my help.

Never Rarely Often Very Often Always

24. The nurse makes all the goals.

Never Rarely Often Very Often Always

25. My parents help the doctor decide what made me sick.

Never Rarely Often Very Often Always

26. My nurse and I agree on how to work toward my health goals.

Never Rarely Often Very Often Always

27. I work with the doctor to decide what needs to be done to make me well.

Never Rarely Often Very Often Always

28. I do my own thing and the nurse does hers or his.

Never Rarely Often Very Often Always

29. The nurse works with me to decide the best way to meet my health goals.

Never Rarely Often Very Often Always

30. I get to answer questions the nurse asks.

Never Rarely Often Very Often Always

31. The doctor answers my questions.

Never Rarely Often Very Often Always

32. The nurse decides how I will reach my health goals without my help.

Never Rarely Often Very Often Always

ATS 6/30/99, 9/27/00, 10/2/00

APPENDIX D

University of Texas Health Science Center
Committee for the Protection of Human Subjects
Approval Letter

THE UNIVERSITY OF TEXAS
HOUSTON
HEALTH SCIENCE CENTER

The Committee for the
Protection of Human Subjects

NOTICE OF APPROVAL TO BEGIN RESEARCH November 10, 2000

HSC-SN-00-023 – "Reliability and Validity Testing of the Adolescent Transaction Scale"
PI: Mary L. Brown, Ph.D. Student

PROVISIONS: Unless otherwise noted, this approval relates to the research to be conducted under the above referenced title and/or to any associated materials considered at this meeting, e.g. study documents, informed consent, etc.

APPROVED: At a Convened Meeting

APPROVAL DATE: October 20, 2000 EXPIRATION DATE: September 30, 2001

CHAIRPERSON: Anne Dougherty, MD

Subject to any provisions noted above, you may now begin this research.

CHANGES – The PI must receive approval form the CPHS before initiating any changes, including those required by the sponsor, which would affect human subjects, e.g. changes in methods or procedures, numbers or kinds of human subjects, or revisions to the informed consent document or procedures. The addition of co-investigators must also receive approval from the CPHS. ALL PROTOCOL REVISIONS MUST BE SUBMITTED TO THE SPONSOR OF THE RESEARCH.

INFORMED CONSENT – Informed consent must be obtained by the PI or designee using the format and procedures approved by the CPHS. The PI must instruct the designee in the methods approved by the CPHS for the consent process. The individual obtaining informed consent must also sign the consent document.

UNANTICIPATED RISK OR HARM, OR ADVERSE DRUG REACTIONS – The PI will immediately inform the CPHS of any unanticipated problems involving risks to subjects or others, of any serious harm to subjects, and of any adverse drug reactions.

RECORDS – The PI will maintain adequate records, including signed consent documents if required, in a manner which ensures confidentiality.

UT-Houston • G.700 John Freeman Building • P.O. Box 20036 • Houston, Texas 77225 • (713) 500-5827 FAX (713) 500-5830
Sonya.K.Emmert@uth.tmc.edu
Located in the Texas Medical Center

APPENDIX E

Texas Woman's University Human Subjects Review Committee
Approval Letter

TEXAS WOMAN'S
UNIVERSITY
DENTON/DALLAS/HOUSTON

THE GRADUATE SCHOOL
P.O. Box 425649
Denton, TX 76204-5649
Phone: 940/898-3400
Fax: 940/898-3412

December 5, 2000

Ms. Mary L. Brown
1715 Kenwick
Pasadena, TX 77504

Dear Ms. Brown:

Thank you for providing the materials necessary for the final approval of your *dissertation* prospectus in the Graduate School. I am pleased to approve the prospectus entitled **"Reliability and Validity Testing of the Adolescent Transaction Scale"**, and I look forward to seeing the results of your study.

If I can be of further assistance, please let me know.

Sincerely yours,

Michael H. Droge
Dean of Graduate Studies and Research

MHD/sjr

cc Dr. Anne Young, Nursing-Houston
Dr. Carolyn Gunning, Nursing

APPENDIX F

School Approval Letter

SOUTH HOUSTON HIGH SCHOOL

3820 SOUTH SHAVER
SOUTH HOUSTON, TEXAS 77587
(713) 944-2450
DORIS BARNES
Principal

October 12, 2000

Mrs. Mary Brown
1715 Kenwick Pl.
Pasadena, TX 77504

Dear Mrs. Brown:

You have permission from South Houston High School and Pasadena Independent School District to conduct your study entitled "Reliability and Validity Testing of the Adolescent Transaction Scale with our students. I understand that at least 320 usable questionnaires are needed and that passive consent is the most appropriate way to attain the large number of subjects needed. Passive consent is appropriate to use in this school.

Sincerely,

Patricia Simons

Mrs. Patricia Simons
Assistant Principal
South Houston High School

PAULA BALLEW
Assistant Principal

RICHARD CLARK
Assistant Principal

MIKE GENCARELLI
Assistant Principal

TANA HAASS
Assistant Principal

PATRICIA SIMONS
Assistant Principal