DEVELOPMENT OF AN INTUITION SEMANTIC INSTRUMENT

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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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Accepted

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ABSTRACT

DEVELOPMENT OF AN INTUITION SEMANTIC INSTRUMENT

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Intuition is currently being measured as a subscale of lengthy, costly, and complicated personality assessment scales. Current measures of intuition have psychometric limitations, lack clinical utility and empirical support. Therefore, the purpose of this study was to develop a reliable and valid instrument to measure intuition. The Himaya Intuition Semantic Scale (HINTS) was developed by the investigator.

Theoretical support was identified using Gestalt Theory, Cognitive Dissonance Theory, and Ornstein's (1977) Modes of Consciousness Theory. Stinchcombe's format was used to structure the merger of the three theories. The components of intuition (wholeness, approximation, spontaneity, and personalization) were identified by a review of the literature and concept analysis. A random sample of 450 nurses in a southern state was selected. The subjects were predominately caucasian, married, females with an average of 13 years of clinical practice.

A pilot study was conducted and content validity was asserted.

A methodological design was used. The findings indicated adequate reliability and validity of HINTS. Alpha coefficient for HINTS was 0.8870. Alpha coefficients for the subscales ranged from 0.7251 for the personalization subscale to 0.7406 for the spontaneity subscale. The item to total correlations of all items ranged between 0.31 and 0.62.

Construct validity was evaluated using exploratory factor analysis. Five factors with four or more items each loading at 0.50 or greater were extracted. The four subscales corresponded to the strongest four factors. The findings of factor analysis supported the four component model and construct validity of HINTS.

HINTS shows promise as a reliable, valid measure of intuition which will help nurses gain information about their preferred modes of decision-making. This knowledge could enhance the use of differences and strengths of various team members in nursing. Intuition fosters creative solutions to increasingly complex problems. Findings reflected themes consistent with attributes of intuition found in nursing literature. A practical, valid, and reliable instrument stimulates the study of

intuition, a hallmark of nursing. HINTS will facilitate accumulating evidence of intuition as a valuable component in clinical judgment. Recognition of intuitive experiences has significant consequences for nurses and nursing.

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CHAPTER I

INTRODUCTION

Strickland and Waltz (1986) remind us, "the development and use of sound measurement tools and practices in nursing research studies are germane to the further development and advancement of nursing knowledge" (p. 79). Their analysis of research journal articles published between January 1980, and September 1981, demonstrated a general lack of clarity and specificity in using the rules of measurement theories appropriate to the study (Strickland & Waltz, 1986). A weakness noted in the 215 variables measured in the 99 studies was the lack of instruments which adequately sampled different dimensions of global variables. Instruments which do not adequately sample the content domain lead to increased measurement errors. Strickland and Waltz (1986) challenge researchers to use devices that ensure the measurement instruments are consistent with the intended meaning of the concept being measured.

Intuition is an unstructured mode of reasoning and a multistage cognitive and affective process of understanding the inner nature of things without a rationale (Westcott, 1968b). The concept of intuition began with Jung's

typology (Jung, 1921/1971). Empirical referents for intuition have been limited to the Myers-Briggs Type Indicator (MBTI), the Singer-Loomis Inventory of Personality (SLIP), Gray-Wheelwright Psychological Type Questionnaire (GW), or interviews of practicing nurses who experience intuitive thinking (Agan, 1987; Benner & Tanner, 1987; Gerrity, 1987; Young, 1987). These instruments or interviews purport to measure one's propensity for intuitive thinking; however, limitations of these instruments have been identified by researchers. Some of these limitations are described by Bastick (1982). Empathy measures have been found to be more positively correlated with intuition than some current measures of intuition (Bastick, 1982). This finding should not be interpreted to mean that measures of empathy can be substituted for a valid measure of intuition.

The need for a new perspective to review Jung's typology was suggested by the results of the Singer and Loomis (1980) study which questioned the validity of Jung's bipolarity assumption. Metzner (1980) noted that paradoxically, while Jung's typology had been clinically useful in providing a framework for understanding individual differences in behavior, no empirical support was evident. A new perspective could lead to the

development of a useful, clinical instrument which is also empirically sound. The effort to develop a valid, reliable instrument resulted in the construction and continuing development of the Himaya Intuition Semantic Scale (HINTS).

Problem of Study

Intuition is currently measured as a subscale of lengthy, costly, and complicated personality assessment scales. In addition, current instruments have psychometric limitations. Current measures of intuition lack clinical utility and empirical support. Inadequate identification of factors associated with intuition prohibits the advancement of knowledge, understanding, and the acceptance of the intuitive process in nursing clinical judgments. Therefore, the problem of the present study was to determine the reliability and validity of the Himaya Intuition Semantic Scale (HINTS), and to validate the components of intuition.

Rationale for the Study

Nurses experience a sense of embarrassment when making decisions based on intuition (Schraeder & Fischer, 1986, 1987). Intuition is considered an invalid way of knowing (Rew, 1987). Scientific rationale is the accepted explanation of decisions made in clinical settings. The

result of this thinking is reflected in nurses discounting their intuition and thus, lending themselves to experience self-doubt. Rew (1989) described a direct positive relationship between nurses acting on their intuition and the nurse's relationship with the physician involved in the situation. Many of the situations revealed intuition was correct and would have made a significant, positive difference in clinical decisions.

Mental health involves sanctions from others in our environment. Although mental health has been ill defined, a general consensus among authorities is that it involves "willingness to be in process" (Rogers, 1951). This means when one sees oneself as a product then he/she is not practicing the becoming part which promotes one's mental health. Nurses who cannot trust their own intuition are reflecting insecurity in their actions.

Martha Rogers (1980) proposed the unitary human beings are greater than the sum of their parts. Nurses who disown their intuition become less than what they are capable of becoming. This is supported by studies which conclude intuitive clinical decisions increase with clinical experience (Benner, 1984; Pyles & Stern, 1983; Young, 1987). For nurses to be greater than the sum of their parts and experience higher levels of mental health,

disowning one's intuitive abilities (and teaching students to do so) must be changed. Intuition involves understanding the inner nature of things without rationale (Westcott, 1968b). Intuition promotes creative solutions to problems. Bruner (1966) stated, scientific hypotheses are a function of intuition. Intuitive knowing is an aspect of the pattern of personal knowledge and as such, may be found credible through reflection and actualization by individuals in nursing as in other sciences (Carper, 1980).

Nurses are taught to use check-lists to ensure the adequate collection of facts or data. Nurses are task-oriented and geared toward using prescribed decision-making modes. Individuals are not encouraged to use their preferred mode of receiving, processing, and judging information. A decreased focus on check-lists and prescribed decision-making will free nurses' time and energy for creative activities.

Conceptual Framework

The theoretical framework used for this study was a merger of three theories within a Stinchcombe framework. The three theories selected were Gestalt Theory, Cognitive Dissonance Theory and Ornstein's (1977) Modes of Consciousness Theory. The theories have major concepts in

common: the concepts representing the constructs of tension or stimulus (ambiguity and novelty), preventive maintenance (redundancy or intuitive process), functional structure (intuition), historical influence, and steady state.

Stinchcombe's (1968) functional form of historicist causal imagery provides a means of depicting self-replicating processes. In terms of intuition, the Stinchcombe causal format provides a means for identifying variables and relationships that maintain intuitive or nonintuitive judgments. Stinchcombe's model specifies constructs and relationships between constructs (concepts) that can be used to guide conceptual level specification across multiple, specific situations.

The purpose of the functional model is to allow for the explanation of recurring processes, such as events or behaviors that are maintained over time. Functional explanations are based on the assumption that consequences of some behaviors are also the causes of that behavior. Stinchcombe's (1968) functional format also allows for consideration of how historical influence can have impact on specific functional selection. For example, prior experience influences intuitive thinking. If an individual stepped on a tack while barefoot and felt no

pain, he/she would experience dissonance; because he/she knows from experience, pain follows stepping on tacks. If an individual had no previous experience with tacks or other sharp objects, he/she would not experience dissonance (Aronson, 1969, p. 6).

In summary, the Stinchcombe causal format can (1) allow testing of reciprocal linkages, (2) guide selection of background variables requiring control, and (3) provide a means for testing specific alternative-tied hypotheses.

Gestalt

Perls, (1973) studied under Gelb who was an early Gestaltist, discussed Gestalt Theory as emphasizing wholeness, and the following cognitive processes: insight, ordering, relating, predicting, and producing situations. Perls (1973) also stressed the importance of awareness, closure, and figure/ground. Awareness is the hub of his approach to Gestalt therapy. Phenomenology is an indispensable first step toward knowing all there is to know. Perls defines a gestalt as, "an irreducible phenomenon. It is an essence that is there and that disappears if the whole is broken up into its components" (1969, p. 63). The dynamic of a gestalt is the need to reach closure and without closure there exists an incomplete gestalt. Closure is part of the law of

Prägnanz, the primary law of Gestalt Theory (Koffka, 1980). Pyles (1981) described the closed gestalt as when "data harmonize or 'add up', when all pertinent facts are considered and the insight is achieved" (p. 73). Perls (1973) described the state of being without emotion as being like a dead, bored machine, but described awareness as a primary goal of the individual for growth.

The concept of Dasein (a Gestalt term similar to intuition) is defined by Perls (1969),

> ...the fact and means of our existence - manifest itself, understandable without explanatoriness; a way to see the world not through the bias of any concept, but where we understand the bias of conceptualizing; a perspective where we are not satisfied to take an abstraction for a whole picture (p. 61).

Perls (1969) described a gestalt as an inherent part of nature, not a man-made concept.

A basic concept of Gestalt Theory is that the whole is greater than, and different from the sum of the parts. A melody is not comprehensible simply by considering the notes separately. In a melody, position of the notes and structure of the whole is important. The same holds true for the solution of problems; one must understand their structure as a whole and view objects and objectives according to their closure, symmetry, and perception.

Gestalt Theory incorporates the Law of Prägnanz, which in turn incorporates the laws of similarity, proximity, closure, and good continuation. According to the law of Prägnanz (pregnancy), something is being shaped, organized as good in form as the prevailing conditions permit with reference to closeness, articulation, consistency of particular wholes on the one hand and of the total field on the other. Closed gestalts provide the best possible equilibrium when a system of stability is achieved (Koffka, 1980).

Cognitive Dissonance

Aronson (1969), and Wicklund and Brehm (1976), described cognitive dissonance as a motivational-drive state which occurs whenever an individual simultaneously holds two cognitions (ideas, beliefs, opinions) which are psychologically inconsistent. A tension state may be said to persist until cognitive work lowers the importance of relevant cognitions discrepant with the elements that are most resistant to change. This cognitive work consists of adding consonant cognitions, increasing the importance of dissonant cognitions, subtracting dissonant cognitions, and decreasing the importance of dissonant cognitions. The resistance-to-change concept is the hallmark of the theory, for without it the unique predictions of the

theory would be impossible. Resistance to change provides an organizing point for determining the magnitude of dissonance and how dissonance will most likely be reduced.

Festinger (1957) lists four kinds of situations in which dissonance can arise (1) logical inconsistency, (2) inconsistency with cultural mores, (3) inconsistency between one cognition and a more general, more encompassing cognition, and (4) past experience. The following are three ways Festinger (1957) proposes to reduce dissonance: (1) by reducing one or more of the elements in dissonant relations, (2) by reducing new cognitive elements that are consonant with an already existing cognition, and (3) by decreasing the importance of the elements involved in the dissonant relations.

Modes of Consciousness

Ornstein (1977) in his Modes of Consciousness Theory described different specializations for the right (arational) and left (rational) hemispheres of the brain. The right (arational) mode is predominately involved with non-linear, holistic, nonverbal, metaphoric, and personal thinking. The arational mode is more specialized for synthesis as compared to the rational mode for analysis. Individuals who are right hemisphere dominant are postulated to be creative, artistic, and imaginative.

Ornstein (1977) purported that knowledge in the arational mode cannot always be translated into sequential terms. This mode of functioning is the prototype of Jung's intuitive type. The right hemisphere processes global, integrated input simultaneously. The rational mode, or the left hemisphere, is predominately involved with linear, verbal, analytical, and logical thinking. Left hemisphere dominant individuals are believed to primarily engage in verbal, mathematical, and analytical activities.

Merger of Theories

Tension operates as a stimulus to a steady state change resulting in alternative functional structures that work to reestablish the steady state. Stinchcombe's framework, as applied to intuition, is depicted in Figure 1. In this model, as tension or stimuli increases, steady state changes. The indirect relationships of the functional condition with functional structures are mediated by selective maintenance, redundancy, or intuitive process.

As a situation increases in ambiguity and novelty, perception of the client as a whole is decreased. According to Gestalt Theory, one must understand the structure as a whole and view it according to his/her Prägnanz (pregnancy). According to Cognitive Dissonance

Theory, the tension state may persist until cognitive work is completed to resolve the dissonance. Similarly, the Law of Prägnanz refers to the pressure exerted by tension toward completion of incomplete tasks. The work needed to resolve the dissonance includes selective maintenance, redundancy, and intuitive processing.

Resolution of cognitive dissonance results in the intuitive process of seeing relationships or patterns. An increase in the intuitive process leads to the intuitive product. This product includes intuitive recognition and intuitive decision. As the intuitive decision increases, the perception of the whole also increases. This completes the feedback loop.

Perception of, or empathic projection with, external novel stimuli evokes the emotional state of the organism. Bastick (1982) proposed:

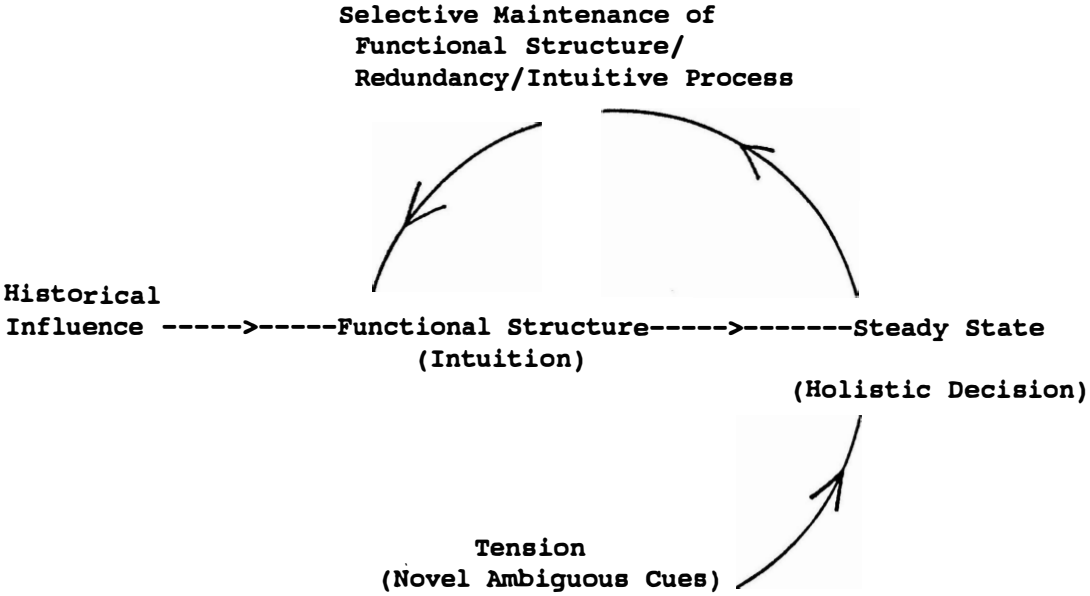
> when two discordant emotional sets vie for control of the organism response tendencies interfere with each other. These conflicting tendencies cause tension. This is the source of tension initiating the intuitive process (p. 127).

This ambiguous problem situation is also reflected by Festinger's (1957) Cognitive Dissonance Theory which addresses the inconsistency between one cognition and a more general, ambiguous and encompassing cognition. The individual needs to form a novel response to reduce this

tension. An intuitive solution, necessarily novel, reduces the tension and gives one the feeling of relief and satisfaction associated with insight solutions.

Figure 1

Stinchcombe's Functional Model
Applied to Intuition



Bastick (1982) predicts intuitive people to be more likely to resolve cognitive dissonance than nonintuitive people. The tolerance for associating one of many partially similar sets with the emotional set evoked by a particular stimulus can produce the novel intuitive

behaviors found in creative types. The following passage gives an example:

> In an ambiguous picture, personality variables will determine mainly what becomes figure and what becomes ground. This cognitive function is greatly influenced by a tendency toward tension-reduction (Bellak, 1944, p. 365).

Transition to one's original state resolves tension. The subject's sensitivity to the unresolved tension is a basis for one's immediate intuitive judgment (Bastick, 1982).

The subjective sudden impression of an intuitive judgment is that it is whole, complete, or almost so. This impression is caused by the sudden awareness of the mass of redundant cognitive and affective information constituting intuition. Bastick (1982) identified the following three points which are responsible for the subjective wholeness of the final intuition: (1) the mass of information available, (2) the suddenness with which it is available, and (3) the large proportion of redundancy interlinking the information.

The components of the intuitive process correspond to the selective maintenance in Stinchcombe's model. The intuitive process or selective maintenance components include six key aspects identified by Dreyfus and Dreyfus (1985). These six aspects include pattern recognition,

similarity recognition, common sense understanding, skilled know-how, sense of salience, and deliberative rationality.

Festinger's (1957) Cognitive Dissonance Theory depicts the selective maintenance of functional structures by identifying ways for reduction of dissonance. The motive for this maintenance is reflected in the premise that individuals attempt to appear rational to themselves and others; therefore, they are rationalizing animals. The presence of dissonance gives rise to pressure to reduce that dissonance.

Redundancy is identified as the characteristic of global knowledge facilitating the intuitive mode of thought, directing the intuitive process and determining the intuitive product. Bastick (1982) identified redundancy as the "combination of large masses of redundant information which is consistent with evidence of the global knowledge property of intuition" (p. 249).

Combining emotional sets or redundancy may be increased by reordering present, available information. The "Eureka" experience can be explained by increasing redundancy through drastically reordering and combining emotional sets.

The verbal mode is restrictive in intuitive thought because of its linear nature. Bastick (1982) explained that the need to give information a global and personal representation results in intuitive processing which favors imagery and visual fantasy rather than verbal representation. Bastick (1982) stated,

> The posited direction of increasing redundancy in intuitive processing implies that category definitions change, overlap, recombine, embed, etc. Encoding variability, increase in possible combinations, and ... transfer of information are just three of the factors ..., contributing to novel intuition (p. 252).

Intuitive products of the intuitive process include intuitive recognition and intuitive judgment. These products result, in part, from whichever source of stimuli evokes the emotional state. These conscious products are characterized by actions or decisions. Intuitive recognition comes with increased redundancy; and redundancy increases the probability of intuitive acceptance. Intuitive judgments of similarity and suitability are made on the redundancy of the emotional sets to which the relevant information is linked.

As intuitive judgments are based on emotional sets, processes affecting these sets will effect the judgments. If the stimulus is discordant with the present emotional set, it will not be intuitively recognized, intuitively

accepted, or intuitively judged. A state of imbalance will result from the dissonance.

Bastick (1982) concluded intuitive judgment is based on the relative ease of transition from one emotional state to another. This implies that intuitive individuals, having a greater ease of transitions between emotional states, will find more subjective consistency between two situations than will analytic individuals. Intuitive individuals will also have greater tolerance of ambiguity than those who are analytic.

Intuition was clarified by the investigator through the process of concept analysis using the analytical process outlined by Walker and Avant (1983). The concept analysis of intuition was based on uses of the concept; delineation of attributes, antecedents, and consequences; construction of various cases; and identification of empirical referents. The investigator mapped attributes and indicators (Figure 2) for the concept of intuition. Four components of intuition were identified. The four components include wholeness, approximation (non-analytical), spontaneity, and personalization (creativity). The components were derived after a comprehensive review of the literature on the concept of intuition and meanings of the term from reference sources.

Figure 2

MAPPING ATTRIBUTES AND INDICATORS FOR THE INTUITION CONCEPT

WHOLENESS	APPROXIMATION/ NONANALYTIC	SPONTANEITY	PERSONALIZATION/ CREATIVITY
- Integration/ Energy Exchange	- Principle	- Hunch/gut	- Personal knowledge
- Relationships Associations	- Possibilities	- Impulse	- Empathy
- Pattern recognition	- Hypotheses	- "Aha", shock of recognition	- Quiet mind
- Similarity recognition	- Anticipation	- Common sense	- Discovery
- Interpretation of data	- Prediction	- Immediate knowing	- Knowing
- Abstract/Design	- Skilled know-how		- Sensing
- Sense of Salience	- "Head in the clouds"		- Dreaming
- Detect missing data, gaps in information, hidden relationships	- Guessing with minimal information		- Insight/ instinct/innate knowledge

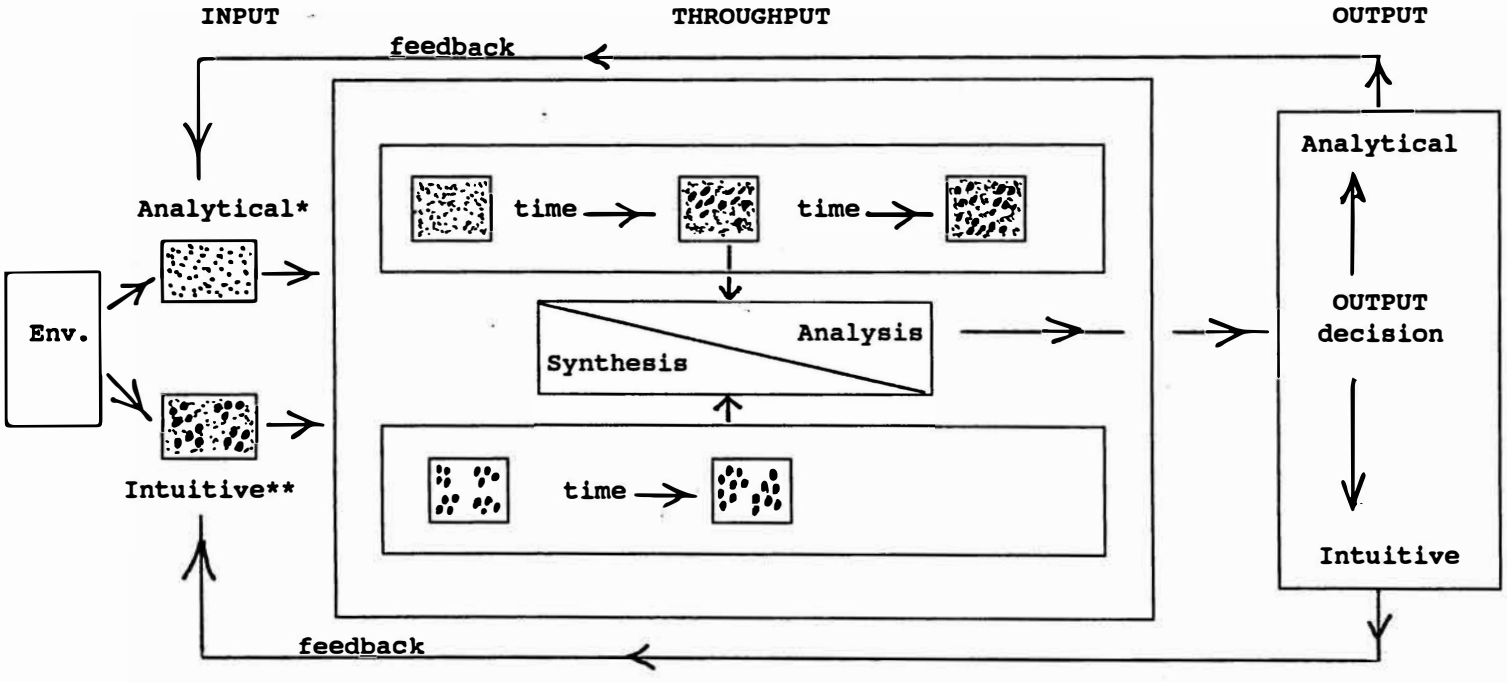
Model for Intuitive and Analytical Processing

The investigator developed a model (Figure 3) for comparison of intuitive and analytical processing. The model consists of input, throughput, and output components. Input into the system is the perceived information presented as millions of bits and pieces for the nonintuitive (analytical) process, or patterns and relationships for the intuitive process. Ten properties of input that stimulate intuitive processing and ten properties that stimulate analytical processing are included. These properties classify the components of intuitive versus analytical processing and the type of information used in each of these operations. For the intuitive process the input is partially analyzed, but predominately synthesized.

The throughput, or operation, of the system was labeled by Stinchcombe (1968) as selective maintenance. Bastick (1982) labeled this as the redundancy process. Dreyfus and Dreyfus (1985) identified six key aspects used during the operation component (intuitive process). The six aspects include: pattern recognition, similarity recognition, common sense understanding, skilled know-how, sense of salience, and deliberative rationality. The output becomes new input through a feedback loop.

Figure 3

MODEL FOR INTUITIVE AND ANALYTICAL PROCESSING



*Analytical	**Intuitive
-Verbal.	Preverbal
-Check lists	Whole/Global
-A lot of data	Relationships
-Structure/rules	Unstructured
-Analytical/logical. . . .	Abstract

*Analytical	**Intuitive
-Explicit.	Implicit
-Long time	Immediate/Sudden
-Exact	Approximation
-Objective	Subjective
-Linear.	Non Linear

Assumptions

1. Intuition exists and can be measured.

2. Intuition is a trait rather than a state.

3. Meaning can be communicated by phrases and/or adjectives.

4. Intuitive persons perceive critical relationships and patterns in the environment more than nonintuitive persons.

5. Intuition and analytical thinking are distinctive modes of thought. Individuals tend to function in and prefer one mode over the other.

6. Individuals who use their preferred modes experience increased insight, empathic ability, and strength in certain areas of decision-making.

7. Intuitive thought requires redundancy activities that include recentering or restructuring of an unfamiliar situation to one that fits a sense of familiarity.

8. Accuracy and correctness are not requirements for making intuitive judgments.

Assuming adequate theoretical sampling scores on tests that measure attributes of two opposing concepts should correlate negatively in persons possessing high levels of one of the attributes and not the other. This would establish discriminant validity of the instrument. Convergent validity is estimated by positively correlating measures of the same or closely related concepts.

Hypotheses

The following hypotheses were tested in the present study with a sample (N=450 registered nurses) from the accessible population of registered nurses in a southern state:

1. The internal consistency reliability coefficient of the HINTS is equal to or greater than 0.70.
2. The internal consistency reliability coefficients for each of the HINTS subscales (wholeness, approximation, spontaneity, and personalization) are equal to or greater than 0.60.
3. All item to total correlations are between 0.30 and 0.70.
4. Wholeness, approximation, spontaneity, and personalization are components of the HINTS.

Definition of Terms

Theoretical Definitions

Intuition: an unstructured mode of reasoning and global knowledge which involves understanding the inner nature of things without a rationale or consensus.

Internal consistency (reliability): the extent to which items in a scale are homogeneous and measure the same construct.

Factors: underlying dimensions which group together to explain the construct (Burns & Grove, 1987).

Factor loadings: correlations of the dimensions with the construct (Kerlinger, 1986).

Nurses: registered nurses in a southern state.

Wholeness: a grasp of the situation in its entirety not in fragmented steps. Recognition of the "known" as neither a thing or process, but an absolute manifestation of its essence. Wholeness should not be confused with the summing up of many factors (psychological, social, and physiological) to make a whole. It is the identification of patterns which are reflective of the whole.

Approximation/Subjective Certainty: the sudden recognition and judgment of an object or event without reference to documentation, data, or check-list.

Spontaneity: a shock of recognition which usually appears when the knower relaxes and moves out of the linear mode of processing information.

Personalization/Creativity: empathy that comes from within and is not empirically validated. Personalization is a knowledge of ultimate reality which does not necessitate consensus (Westcott, 1968a).

Operational Definitions

Nurses: registered nurses listed in the 1990 directory of individuals licensed to practice nursing in a southern state.

Intuition: measured by HINTS.

Wholeness: measured by the wholeness subscale of HINTS.

Approximation: measured by the approximation subscale of HINTS.

Spontaneity: measured by the spontaneity subscale of HINTS.

Personalization: measured by the personalization subscale of HINTS.

Internal Consistency (reliability): measured by Cronbach's alpha correlation coefficient for each subscale of the HINTS and for the total instrument.

Factor (Dimension): a cluster of at least four items which load at or greater than 0.50 on the dimensions of HINTS.

Factor Loadings: regression coefficients of the variables (items) on the factor (dimension).

Limitations

1. The sample was limited to the availability of volunteer nurses who completed the HINTS. The sample was delimited to nurses listed in the 1990 directory published by the State Board of Nursing of a southern state.

2. Respondents had no direct access to the investigator to clarify questions regarding the written instructions. While the address and phone number were sent to the potential respondents, they may have been reluctant to contact the investigator.

3. The use of a semantic differential, a self report measure, is limited to what the subjects know about themselves and what they are willing to share. Self report measures, in general, are limited by the extent of clarity of the instrument and the extent of honesty of the subjects. Assurance of confidentiality and anonymity was used to increase the honesty of the responses.

4. Intrinsic and extrinsic weaknesses that accompany rating scales were additional limitations. These weaknesses included the halo effect, error of severity, error of leniency, and error of central tendency. The halo effect is extremely difficult to avoid. The halo effect is strong in traits that are not easily observable and that are morally important (Kerlinger, 1986).

5. The analysis of the data dealt with the sample as a whole. This possibly confounded some influencing variables such as level of clinical expertise and educational preparation; however, no significant trend was found in the descriptive statistics performed on the data.

Summary

Chapter One demonstrated a need for a current, valid, and reliable measure of intuition for use in nursing research. The methodological framework was drawn from classical and generalizability Psychometric Theory. Theoretical support for the concept of intuition was identified using Gestalt Theory, Cognitive Dissonance Theory, and Ornstein's Modes of Consciousness Theory. Stinchcombe's format was used to structure the merger of these three theories. A conceptual map of intuition was developed by the investigator and was utilized in the study.

CHAPTER II

REVIEW OF THE LITERATURE

The present study involved the development of an instrument to measure the level of intuition in nurses. The review of the literature concerns the theoretical and empirical support for the developing instrument to measure intuition. The major areas of literature review included are historical perspectives on the influence of intuition, current world views, and conceptual definition of intuition. Comparison with existing instruments are discussed as well as the psychometric properties estimated during instrument development.

World Views

> In the Western philosophy in the nineteenth and twentieth centuries, positivism gradually replaced the classical intuitivism represented by the work of Spinoza and Henri Bergson. Both of these philosophers held that it is *only* intuition that leads to the apprehension of ultimate reality. In Eastern religions and mystic philosophy, inner contemplation and intuitive understanding are primary routes to basic knowledge, if not to God (Belenky, M., Clinchy, B., Goldberger, N., & Tarule, J., 1986, p. 55).

According to Summers (1976), Bergson proposed the "human mind is ordinarily unable to grasp life's movement

due to the intellect which imposes 'patterned immobility'" (p. 282). Bergson (1911/1965) defined intuition as the mental process that directly experiences the happening (event). In this regard, Bergson (1911/1965) states

> On our personality, on our liberty, on the place we occupy in the whole of nature, on our origin and perhaps also on our destiny, it (intuition) throws a light, feeble ..., but one which none the less pierces the darkness of the night in which the intellect leaves us (p. 282).

Spinoza (cited in Summers, 1976) asked "... who can know he is certain of anything unless he first be certain of that thing" (p. 70). Spinoza believed real knowledge is knowledge which is intuitively grasped. Spinoza stressed knowledge of "clearly knowing truth" as a satisfying experience. Spinoza believed intuition can operate after reason is exhausted and abandoned. Both Bergson and Spinoza believed direct contact with reality is possible only through intuition (Summers, 1976).

Another "classical intuitionist", Croce (cited in Summers, 1976), stressed the aesthetic benefits of intuition. Environmental stimuli are received, sorted, rejected, and synthesized by the process called intuition. Croce believed beauty to be the consequence of intuition not a property of nature. The age old adage, "Beauty is in the eye of the beholder", is derived from Croce's point of view as well as Plato's concept of the eye being a

mirror to the soul and that one knows others and oneself by the pupil. Croce called intuitive knowledge the comprehension of the relation among things, (Summers, 1976), or as Dreyfus and Dreyfus (1985) later called it, pattern recognition.

Related Disciplines

Carl Jung, a follower of Freud, was one of the first to study intuition in depth. In his book Psychological Types Jung included intuition as a function that transmits meaningful, unconscious perceptions. Jung described an intuitive type as one guided by perception through the unconscious (Jung, 1921/1971).

Intuition is defined in The Encyclopedia Americana (1984) as:

> a way of knowing directly, excluding all inference, discursive reasoning, logic, and the employment of symbols and ideas. It also is a direct acquaintance with oneself that cannot be put into words, or a similar sensitivity to the thoughts and feelings of others (p. 324).

Jerome Bruner (1966), a prominent psychologist, devoted much of his work to promoting the meaning and importance of intuition, especially to educators. He questioned ways that teachers foster intuition. However, he and others failed to clearly describe intuition. Bruner (1966) discussed different kinds of thinking based on the dominant or active hemisphere of the brain. Bruner

refers to the right hand and left hand (which would involve opposite cerebral hemispheres). One is the "doer" and the other the "dreamer". The right is order and lawfulness. Reaching for knowledge with the right hand is science. Bruner (1966) states that separation of the two modes of learning or knowing cripples the person.

Loye (1983) identified three types of intuition. These include cognitive inference, Gestalt intuition, and precognitive intuition. Rew (1988) defined these three types of intuition:

> cognitive inference, occurs when conclusions are determined spontaneously...Gestalt intuition in which the person detects missing data, gaps in information, or hidden relationships within the whole...Precognitive allowing for the possibility of gaining information directly about the future rather than by inference based on knowledge of the past and present (p. 251).

Dogmatism, authoritarianism, and conservatism have been frequently considered as opposing the intuitive process. Gerber (1972) found negative correlations between dogmatism and the four variables: independence, complexity, affective receptivity, and creativity. Westcott (1968a) reported creativity correlated positively with tolerance of ambiguity. Rossman and Horn (1972) found Rokeach's Dogmatism scale loaded negatively on their creativity factor. Thematic Apperception Test (TAT) empathy scores have been reported to correlate positively

with field independence and negatively with dogmatism (Gerber, 1972; Rossman & Horn, 1972). Hammer (1973) found that moral courage for taking risks and exploring ordinarily tabooed or forbidden areas is a prerequisite for creativity. Bastick (1982) reported a study by Kvascev and Popov found creative subjects were able to base imaginative ideas on non-structured material in their 1972 study. They also found creative subjects had a tolerance for vagueness and ambiguity.

Since intuition occurs when a situation tends to appear puzzling or confused, a necessary cognitive reorganization must occur before the sense of knowing occurs. Poincarè (as cited in Bastick, 1982) explained that intuition reveals relationships between facts long known, but wrongly believed to be strangers to one another.

Belenky, et al, (1986) stated mental processes dealing with the personal and interpersonal have not been called thinking, but fall under the rubric of "emotions". Belenky concluded the "either or thinking" about knowledge has led to a view of human beings as closed systems. She also reports that much psychological research has used male subjects which may have contributed to our knowledge of autonomy, independence, rights, and justice at the

expense of gaining knowledge of interdependence, intimacy, nurturance and contextual thought.

Subjects in a study of 135 women who were considered to be constructivist knowers realized the limitations of common frameworks for knowing and the need to create a personal frame. These subjects reported a way of knowing called constructed knowledge (Belenky, et al., 1986). This constructed knowledge began as an effort to reclaim the self by attempting to integrate knowledge which they felt intuitively was personally salient with knowledge they had learned from others. These subjects related blending together the ingredients of rational and emotive thought and of integrating objective and subjective knowing. Instead of loosing the self in the acquisition of knowledge, these women used themselves in rising to a new way of thinking, a heightened awareness. As one of these subjects described the blending, "You let the inside out and the outside in" (Belenky, et al., 1986, p. 135). The women in this study, who developed this level of knowing, had intentionally taken time out to get to know themselves and to reflect on the context of their experiences and knowledge.

Belenky, et al. (1986) submitted,

> Once knowers assume the general relativity of knowledge, that their frame of reference matters and that they can construct and reconstruct frames of reference, they feel responsible for examining, questioning, and developing the systems that they will use for constructing knowledge (p. 138-139).

The process of sorting out the self and the contexts lead women to the insights of constructivist thought.

Belenky et al. (1986) describe the characteristics of the constructivist knower. In constructivist thought the knower is an intimate part of the known. The constructivist knower is tolerant of ambiguity and is fascinated by complexity. Procedural knowers remain subservient to discipline and systems while constructivists go beyond the system to make connections that tie together pockets of knowledge. These findings of the characteristics of constructivists reflect characteristics of intuition such as the knower becoming the known, the tolerance for ambiguity, and the connection of events wrongly believed to be separate. Active participation of the knower in learning, a passion for learning, and empathy are other characteristics found in the constructivists (Belenky, et al., 1986). These are also characteristics of intuition.

The synthesis of the rational, analytic with the subjective, intuitive knowing is relevant to the need to connect both modes in nursing. Nursing is a primarily female profession dominated by male physicians. The feminist movement has helped move the ideas of women and intuitive knowing out of the devalued position; however, there is need for more information on intuitive judgments, and "women's ways of knowing" (Belenky, et al., 1986).

Cosier and Aplin (1982), in a study of simulated managerial problems, found the individuals with high levels of intuitive ability made better decisions than those with low levels of intuitive ability. Burns (1987) concluded top managers used intuition to guide key decisions in major corporations.

Simonton (1975) studied the relationship of intuition to creativity in problem-solving. His results showed high creatives improved in their ability to solve problems under the instruction to intuit, and low creatives improved their problem-solving ability under the instruction to analyze. In addition, Simonton (1975) found that more creative subjects found intuition more effective for complex tasks, and analysis on simple tasks. This relation was reversed for the less creative subjects. Two conclusions from this study are that intuition and

analysis may be distinctive modes of thoughts, and that the relative effectiveness of each may depend on both the nature of a problem and the cognitive style of the individual. Simonton's sample was limited to 40 volunteer Harvard-Radcliffe students.

Polanyi (1969) discussed the use of the concept intuition as a skill for guessing with a reasonable chance of guessing right guided by innate sensibility to coherence improved by schooling. Bruner (1963) disagreed with Polanyi when he wrote, "Intuition is not allowed to operate freely in most school curricula. Because much emphasis has been placed on formalism, the child's intuitive approaches have been inhibited" (p. 2). Polanyi's concept of intuition included the imagining of things not yet present and perhaps never to be.

Polanyi (1966a) reported tacit knowledge is fundamental to all knowing. He included two processes involved in tacit knowledge. The first involves perceptions of particulars, including feelings where, "we can know more than we can tell" (p. 4). The second process of tacit knowledge involves intuition and

imagination. Polanyi (1966b) stated

> It is intuition that senses the presence of hidden resources for solving a problem and which launches the imagination in its pursuit. And it is intuition that forms there our surmises and which eventually selects from the material mobilized by the imagination the relevant pieces of evidence and integrates them into the solution of the problem (p. 89).

Vaughn (1977) reported a study by Maslow found a greater ability to transcend duality (rational-conceptual versus intuitive-holistic) in truly self-actualized people. Other people (the rest of us), in moments of acute integration, could experience integration within the self, and between self and the world. These moments are what are called "peak experiences".

Dreyfus and Dreyfus (1985) supported Vaughn's idea when they listed the following six components of intuition:

1. pattern recognition
2. similarity recognition
3. common sense understanding
4. skilled know-how
5. sense of salience
6. deliberative rationality

Pattern recognition occurs when a new or unique situation is cognitively restructured to produce a sense of familiarity. Similarity recognition is the ability to see similarities even when logic wrongly assumes two situations are not related. Common sense understanding

becomes evident by one of the consequences of intuitive knowing. The common phrase so often mentioned at the moment of intuition is, "Oh, that was so simple!" The fourth aspect, skilled know-how, appears in the intuitive person as a consequence more than a defining attribute. Those who trust their intuitions can solve problems and make decisions quickly, and this appears to observers as if they reach logical conclusions rapidly. Actually, they know by a process of synthesis versus analysis (Dreyfus & Dreyfus, 1985).

The fifth aspect is a sense of salience which is observed when important events stand out. The intuitive person seems to know what to attend to and perceives the covert meanings in messages.

Finally, the sixth aspect, deliberative rationality, is determining how one's perception would change one's interpretation. This can be illustrated by a case given from memory. To know the meaning of "parachute" one uses visual imagery or definition type thinking. To change one's perception of parachute, some stimulus may be added which then would change the "knowing"; for this case we add a descriptive statement, "The haystack became important, because the seam ripped". This transfer of modes of thinking is common in Zen Buddhism and is called

a Koan which is used to free the mind of the typical analytical response to allow intuitive responding to occur (Dreyfus & Dreyfus, 1985).

Nursing and Intuition

Chenault (1964) recognized the need for accepting intuitive ways of knowing in nursing when she said,

> We may assume that the student with the soul of a poet has less to offer. Yet the less literal minded student who is uncomfortable with the boundaries of rules and who resists directional prescriptions may have an equal contribution to the profession in sensitivity and rebellion" (p. 32).

Rew (1986) identified three defining attributes of intuition: "(a) knowledge is received as a whole, (b) awareness of knowledge is immediate, and (c) knowledge is not acquired through analytic reasoning" (p. 23).

Young (1987) defined clinical intuition,

> as a process whereby the nurse knows something about a patient that cannot be verbalized, that is verbalized with difficulty, or for which the source of knowledge cannot be determined (p. 52).

Young (1987) uses Langer (1967) to support feelings as a form of knowledge fundamental to the act of knowing. Young (1987) quotes Langer, "It is not improbable that intellect is a high form of feeling -- a specialized, intensive feeling about intuitions" (p. 54).

The fifth aspect of Dreyfus and Dreyfus (1985), sense of salience (where important events stand out) is demonstrated by Agan (1987). Example cases of Gail and Judith demonstrate this sense of salience. Gail, using rational thinking, verified a medical diagnosis of depression; later through therapeutic touch and intuiting, she discovered a serious substance abuse problem. In another example, Judith also attended to the important areas of focus. As quoted by Agan, Judith said, "I sense where it is that I'm needed" (1987, p. 67).

Sanford (1985) reported an instance in which Florence Nightingale criticized nurses who could not communicate the seriousness of their patients problems due to a lack of observation and empirical referents. This is one of the earliest accounts of discounting intuition in nursing. Much of the negativism associated with intuition in nursing is related to the fact nursing has been primarily composed of women, who were serving male physicians (Rew, 1987; Sanford, 1985). Sampson (1978) supported this belief by stating it is likely that the commonly accepted stereotype of women's thinking as emotional, intuitive, and personalized has led to the devaluation of women's minds and contributions. The high technology standard of today's world encourages this devaluation of the feeling,

intuitive, and personalized knowledge when it occurs in either males or females.

Patricia Benner and Christine Tanner (1987) attempted to identify the nature and role of intuition in expert clinical judgment. They used Dreyfus and Dreyfus's six critical aspects of intuition and demonstrated these aspects by observations of nurses' clinical judgment. Although expert nurses had faith in their clinical judgment and their judgment was demonstrated to be correct, these nurses felt disadvantaged. The nurses reported inability to present a persuasive rationale based on the relationships among elements of the evidence and did not consider their judgments to be based on legitimate knowledge.

Gerrity (1987) cautions against the overuse of sensing or linear thinking, as opposed to intuition in nursing. She proposes that the result will be, "...common agreement with an external reality, as if the sum of the parts were actually as great as the whole" (Gerrity, 1987, p. 68). Gerrity (1987) also discusses how care plans are not representative of intuitive data necessary to give effective nursing care.

Gerrity (1987) reported that Myers-Briggs Type Indicator (MBTI) data on file indicated approximately 56 percent of nurses in the Center for Applications of Psychological Type (CAPT) data bank indicated sensing as their preferred way of perceiving. Only 21 percent reported intuition as their dominant function while 23 percent indicated intuition as their auxiliary function. Therefore, the majority of nurses spend most of their time taking in information through sensing and rush the intuitive phase of data gathering. In general, nurses are individuals who prefer sensing and whose intuitive process is less developed. Since the least preferred process is not used as much, intuition remains immature. Undeveloped traits or processes tend to become imprisoned if they are not used which results in a process Wicker (1985) calls a conceptual rut. If an ability is over suppressed, it can emerge in an uncontrolled manner, or as Myers and Myers (1980) stated, "come to consciousness in violent revolt" (p. 52).

Existing Instruments

Empirical referents for intuition have been limited to the Myers-Briggs Type Indicator (MBTI), the Gray-Wheelwright Psychological Type Questionnaire, and the Singer-Loomis Inventory of Personality (SLIP). These

instruments purport to measure one's propensity for intuition; however, the limitations of these instruments were identified by researchers (Bastick, 1982).

Myers-Briggs Type Indicator (MBTI)

Description. The Myers-Briggs Type Indicator (Myers, 1962) is a forced-choice, self-report, paper-and-pencil inventory. The MBTI classifies people on the basis of their reported behavior, preferences, and value judgments into dichotomous categories along each of four interlocking indices. The extraversion-introversion index (E-I) indicates whether a person directs perception and judgment upon the environment (E) or upon the world of ideas (I). The sensation-intuition index (S-N) indicates whether a person relies on sensing (S) or intuition (N) processes in perceiving. The thinking-feeling (T-F) index indicates whether a person relies on thinking (T) or feeling (F) processes in making judgments. The judging-perceiving index (J-P) indicates whether a person uses a judging (J) or a perceptive (P) attitude in dealing with the environment. These are based on Jungian theory. Using the four indices together, 16 types can be generated.

Myers-Briggs Type Indicator scores may be regarded as either dichotomous or continuous data, eight numerical scores are obtained which can be transformed into four continuous scores (Myers, 1962). The continuous scores retain much information which is lost by dichotomous scores; however, the theory on which the MBTI is based is inconsistent with the use of continuous scores. This explains the bipolarity issue.

Reliability. Test-retest reliability studies have been published by Carlyn (1977), and Stricker and Ross (1964). Test-retest reliability coefficients from these studies range from .48 to .87. Researchers (Hoffman, 1974; Myers, 1962; Webb, 1964) estimated reliability coefficients of type categories on the MBTI which appear to be satisfactory although there is a rather wide range between conservative and liberal estimates of internal consistency. These studies have reported phi coefficients ranging from 0.64 to 0.73 for S-N (Sensing-Intuition). Tetrachoric coefficients were reported ranging from 0.82 to 0.92 for S-N (Sensing-Intuition). Myers (1962), Webb (1964), and Stricker and Ross (1962) reported similar reliability results with coefficients ranging from 0.76 to 0.82 (E-I), 0.75 to 0.87 (S-N), 0.69 to 0.86 (T-F), and 0.80 to 0.84 (J-P).

Validity. Myers (1962) and Stricker and Ross (1962) reported content validity, predictive validity and construct validity. Stricker and Ross (1962) examined item content and concluded the (S-N) and (T-F) scales seem largely consistent with their corresponding conceptual definitions, but the (E-I) and (J-P) scales may measure something quite different from the postulated dimensions.

Bradway (1964) asked twenty-eight Jungian analysts to classify themselves according to the (E-I), (S-N), and (T-F) type categories. Comparisons were made between self-typing and MBTI typing. There was 100% agreement on (E-I) classification, 68% agreement on (S-N), 61% agreement on (T-F), and 43% agreement on all three dimensions. Bradway also compared the 28 analysts using two tests. The findings reveled agreement between the MBTI and the GW scales as: 96% on E-I; 75% on S-N; 72% on T-F; and 54% on all three dimensions. The E-I index thus is considered to be valid as a self-report measure for a population of Jungian analysts. Considering the purpose of the MBTI to measure Jung's typology, subjects who had studied Jung's theory would know the scale for which the items were intended and answer according to their training.

Three studies (Conary, 1966; Goldschmid, 1967; Stricker, Schiffman, & Ross, 1965) examined the ability of the MBTI to predict choice of major and success in college. Results of these studies concluded a contingency measure combining all four type categories had greater predictive validity than did the individual scales. The studies cited above suggest the MBTI has moderate predictive validity in certain areas. Additional studies are needed if the instrument is to be used to help make decisions about people.

Correlation studies (Mendelsohn, 1965; Myers, 1962; Ross, 1966; Stricker, et al., 1965; Webb, 1964) of construct validity compared MBTI scores with scores on other instruments. The evidence gathered appears to be consistent with Jungian theory.

Research Studies. In 1975 a nonprofit Center for Applications of Psychological Type (CAPT) was established in Gainesville, Florida. The CAPT offers MBTI users computer scoring, research assistance, and a data bank of scores on various populations.

Numerous articles have been published which use the MBTI. Masters theses and doctoral dissertations have also used the MBTI. Studies (Conary, 1966; Myers, 1962; Webb, 1964) of intercorrelations of type category scores and

continuous scores have consistently shown to correlate with the J-P scale. The judgment-perception dimension appears to be related to either thinking-feeling or intuition-sensing. Intuitive persons tend to be perceptive and sensors tend to use judgment.

Gray-Wheelwright Psychological Type Questionnaire

Description. The Gray-Wheelwright Psychological Type Questionnaire (GW) was developed on the West coast at about the same time the MBTI was developed on the East coast (Myers, 1962). The GW is similar to the MBTI. Both instruments assign subjects to type categories and are designed to identify Jungian types. The Gray-Wheelwright has no (J-P) scale (Wheelwright, Wheelwright, & Buehler, 1964). The Gray-Wheelwright, the first instrument to attempt to assess Jungian theory by an objective means, is also known as Jungian Type Survey. It was developed by two Jungian analysts (Myers, 1962). The GW is a forced-choice self-report, which yields scores for the subjects preference for thinking versus feeling and sensation versus intuition as well as the orientation or attitude scale of introversion versus extraversion.

Reliability. The average reliability coefficient of the GW, as reported by Stricker and Ross (1962), was .51. The individual scale reliability coefficients were: .64

for the E-I scale, .58 for S-N, and .30 for T-F. These numbers are based on a small sample of 47 male Golden Gate College students.

Validity. Evidence for validity was obtained by correlating the subjects' MBTI scores with their scores on the GW (Stricker & Ross, 1962). According to Myers (1962) the E-I and T-F scales on both the MBTI and GW are, "essentially two forms of the same test" (p. 22). The lack of a scale to measure the way the individual relates to the outside world (the J-P scale) is considered one of the instrument's major limitations. The published information concerning studies using the GW and related reliability and validity are limited.

Research Studies. The amount of research conducted with and on the GW seems to be geographically controlled and overshadowed by the MBTI. The authors of the SLIP administered the GW original version and a modified version. The modification of the GW consisted of changing one forced-choice item into two scaled items, for a group of the original items. This study demonstrated 72% of the 120 subjects changed their dominant function preference between the two versions of the GW. Sixty-six or 55 percent of these subjects did not have an inferior function that was the hypothesized opposite of their

dominant function (Singer & Loomis, 1984). The identical procedure was used with two versions of the MBTI. The GW demonstrated a greater change between its two versions than the MBTI.

The Singer-Loomis Inventory of Personality (SLIP)

Description. The SLIP, is a self-report instrument for assessing Jung's psychological types. It appraises the respondent's choices among alternative cognitive modes without endorsing Jung's bipolarity assumption. The SLIP adapts Jung's system of two "attitudes" (Extraversion and Introversion) and four information processing functions, two concerned with perceptual orientation (Sensation and Intuition) and two concerned with judging operations (Feeling and Thinking). The functions and attitudes are blended to yield eight cognitive modes.

The SLIP measures the relative development of eight basic cognitive modes. The least developed (inferior) function is considered to be the cognitive mode with the lowest score, and the dominant function the cognitive mode with the highest score. The individual's cognitive style is assessed by the patterning of the cognitive mode scores. When introversion and extraversion are not separated by at least 12 points the individual is said to orient himself/herself toward inner and outer worlds with

equal ease. And may be called ambivert. The judging and perceiving functions must also be separated by 12 points. The subjects being at ease in a structured or unstructured world is measured by the preference for judging or perceiving (Singer & Loomis, 1984).

The SLIP provides 15 common situations each with eight alternative responses. The subjects are asked to evaluate each response on a scale of one (never) to five (always), reflecting the subject's probable behavior. Singer and Loomis (1980) reasoned more accurate Jungian profiles would be obtained if Jung's types were measured independently instead of by forced choice items.

The SLIP yields six composite scores (Introversion, Extraversion, Thinking, Feeling, Sensation, and Intuition). Comparison of the strength of the scales between individuals or between an individual and a norm are inappropriate, because the scores are computed by a percentage of total score method.

Reliability. The alpha reliability coefficients for the four functions were .73 for feeling, .76 for intuition, and .80 for both thinking and sensation. The average alpha coefficient was .77, for the four functions. Introversion and extraversion had reliability coefficients of .85 and .88 respectively. Judging and perceiving had

reliability coefficients of .86 and .85 respectively. The 1188 subjects were almost exclusively white, and over half had graduate training, and approximately 40% were male and 60% female (Singer & Loomis, 1984).

Validity. Content validity was assessed by a panel of experts consisting of Jungian analysts or Jungian-oriented therapists. The original version contained 20 situations (Singer & Loomis, 1984).

Construct validity for the SLIP was assessed for the initial version by principal components factor analysis. A factor analysis solution with eight factors was expected; however, five emerged. The factors which emerged accounted for 34% of the variance and were claimed to support Jung's constructs. The second factor was labeled intuition and contained items which were introverted and extraverted. Imagination and possibilities were the themes of this factor (Loomis, 1982). The five factors revealed in the factor analysis were: feeling, intuition, thinking, introverted sensation and extraverted sensation. These findings should be interpreted with caution because of the inadequate number of subjects per item for a factor analysis.

Research Studies. The SLIP has been used in doctoral dissertations and published research articles they include: Bruwer (1987), Evans (1985), Hurley and Cosgro (1986), Mahlberg (1982), and Mahlberg (1987). Colucciello (1986) found discrepancies between the data of the SLIP and the MBTI. In a sample of nursing students, feelings correlated with professional socialization on the SLIP and thinking correlated with professional socialization on the MBTI. The differences in findings suggest these measures lack concurrent validity and do not measure the same constructs.

The initial version of the SLIP was utilized in the dissertation research of one of its authors (Loomis, 1980). Loomis administered the SLIP to 218 individuals consisting of a heterogeneous group of undergraduate and graduate college students, professionals in the health care fields, individuals attending adult education courses, and professional artists. The first version was revised based on the findings of a principal components factor analysis.

Loomis (1982) found the SLIP's intuition scale had the highest congruence (88%) with the self description of the subjects. These subjects consisted of 218 artists and psychotherapists. The psychotherapists scored higher on

extraverted and introverted intuition. A comparison revealed psychologists to have higher mean scores for intuition and extraverted thinking than artists. The functions with the highest and lowest mean scores for both groups, were feeling and thinking respectively. This finding may reflect a tendency for social desirability answering. In the factor analysis, feeling accounted for 8.96% of the variance, intuition 8.35% of the variance, thinking 6.07% of the variance, introverted sensation 5.75% of the variance, and extraverted sensation 4.76% of the variance. Introverted and extraverted modes of feeling, intuition and thinking did not emerge in the factor analysis (Loomis, 1982). These findings lend support to the correlation of intuition with empathy and interpersonal nature of both empathy and intuition (Loomis, 1982).

Metzner (1980) in the reformulation of Jung's typology also recognized the need to assess the four functions separately. Studies by Singer and Loomis (1984) and Metzner (1980) demonstrated a lack of empirical support for Jung's constructs with the MBTI. According to Jung's theory introversion and extraversion do not exist independent of the function (Thinking, Feeling, Sensation, or Intuition). His psychological types combine attitude

and functions, i.e. introverted thinking, and extraverted thinking, introverted feeling, etc.

A third edition of the SLIP is available as an experimental version. The SLIP is currently being computer scored and banked by the Psychology Department at Wayne State University. The authors encourage researchers to use the SLIP, and contribute data regarding its psychometric properties. Administration of the SLIP requires a $15 fee per test and attendance at a workshop to be instructed in its use.

Summary

A review of the literature portrays a predominate move in the world view toward logical positivism. This view devalued intuition. The literature also documents the limitations of linear, analytical reasoning. Positive relationships between intuition and creativity, tolerance for ambiguity, as well as empathy, were reported in the review of the literature. Intuition correlated negatively to rigid environments, and dogmatism.

Varied fields have studied the effects of intuition and found these effects to result in effective decision-making. The fields included psychology, education, mathematics, and management.

Goldberg (1983) cited the effects of high technology and "sciencism" on individuals. People feel alienated in a highly technical environment. Stress-related illnesses have been associated with technological advances. Objective, scientific methods have resulted in an increased awareness of the uncertainty of science. Intuition provides creative solution to the problems associated with technology. Furthermore, when intuitive thinking is promoted the methods used to encourage intuition will also reduce the stress associated with technology. Therefore, the more advanced science becomes the greater the need for creative, intuitive people.

Review of the nursing literature reflected a beginning focus on qualitative methods of research, such as phenomenology to gain heightened awareness of the lived experience. Several authors (Belenky, et al., 1986; Benner & Tanner, 1987; Gerrity, 1987) report results of qualitative studies on intuition. These authors challenge nursing to increase its knowledge of intuition and synthesize analytical and intuitive reasoning. Therefore, a practical instrument to measure intuition is needed to facilitate more evidence on intuitive processes.

Three existing instruments (MBTI, GW, and SLIP) were found in the literature. The psychometric properties of these instruments were described. The limitations of these instruments were identified. These limitations included the complicated type of instrument, the qualifications necessary to administer and interpret these instruments, the cost of administration in both time and money. Factor analyses of these inventories, designed to measure Jung's typology, failed to substantiate that the instruments were measuring what they purported to measure (Mendelsohn, 1965; Wozny, 1966). This failure is critical not only in the utility of the instrument(s) in research studies but also in clinical settings where determination of individual differences influence clinical decisions. The SLIP, with the deletion of the bipolarity assumption of the functions, is considered an improvement over the MBTI and GW (Hurley & Cosgro, 1986).

Several authors (Gerber, 1972; Hammer, 1973; Rossman & Horn, 1972; Westcott, 1968a) reached conclusions regarding intuition which show a consensus. These conclusions involve the relationship of intuition to creativity and to empathy. Other conclusions agree regarding the negative correlation between intuition and dogmatism. While intuition has been relegated to the

rubric of "emotion" not thinking, there have been several studies (Burns, 1987; Cosier & Aplin, 1982; Rew, 1988; Schraeder & Fischer, 1986, 1987; Simonton, 1975; Westcott, 1968a) noting the effectiveness of intuitive decision-making. Simonton (1975), Cosier and Aplin (1982), Gerrity (1987), and Rew (1986, 1987, 1988, 1989) each provided evidence of the positive effects of intuition. Intuition has also been associated with holistic thinking, which is described in the findings of intuitive people tending to focus on human as opposed to technical needs.

The literature review included the defining attributes of intuition which illuminate the theory on which to develop a measure of the concept. The model of intuitive judgment which includes a four variable construct is identified as a guide to establish the validity of the scale to measure intuition. A valid and reliable measure of intuition is needed for more than answering the question of who is intuitive. It is a means to understand strengths of various members of the nursing team, a way to maximize the potential of each nurse. Increased knowledge of intuition and its predictor variables will dramatically influence how nurses teach, practice, communicate, and evaluate nursing care.

CHAPTER III

PROCEDURES FOR COLLECTION AND TREATMENT OF DATA

Chapter Three describes the design of the study, population, and sample selection criteria. Also included in this chapter is the strategy for data collection and data analysis. Procedures and findings of the pilot study are included. This methodological study investigated the validity and reliability of the HINTS. Methods of obtaining data, scaling issues, item writing, and item analysis are major considerations in methodological studies. HINTS measures the construct of intuition, an important variable for future nursing research.

A correlational design was selected for this study. Correlational studies examine relationships. The researcher, in correlational studies utilizes correlational procedures and techniques to examine the systematic relationships that do or do not exist between two or more variables. Descriptive correlational design was preferable in the analysis of data in this study.

Intuition is a trait which was measured by a norm-referenced framework. Norm-referenced measures reflect levels of a trait for an individual as compared to others in the group. According to Cronbach (1970) scores on a

trait measure for an attribute represent the probability that an individual will respond in a particular way to particular situations and/or stimuli.

Setting

The setting for the study was one southern state. The selected state is similar to the majority of states in the educational preparation and legal requirements for registered nurses (N=31,003). Data were collected by mail from a random sample of registered nurses from the 1990 published directory of all licensed registered nurses of the selected southern state.

Population and Sample

Registered nurses (N = 900) in a southern state were randomly chosen from the 1990 directory of all registered nurses (N=31,003). The projected sample size was 440 nurses, based on an approximate fifty percent return. All subjects, licensed Registered Nurses, were assumed to comprehend the terminology used in the instrument.

The target population of this study consisted of nurses in the United States. The target population was the entire set of individuals or elements defined by the sampling criteria established for the study.

The sample was randomly selected from the accessible population with each individual in the accessible population having equal opportunity to be selected for the sample. The purpose of randomization was to ensure that the sample was representative of the accessible target population. A southern state, an accessible population to the investigator, was identified. An accessible population was that portion of the target population to which the investigator had reasonable access. In this study the sample was obtained from the accessible population. Findings were, therefore, generalizable to the accessible population, and also more abstractly, to the target population.

Construct validity was estimated using factor analysis. According to Kerlinger (1986), the use of large samples with factor analysis procedures helps to reduce error variance or measurement and sampling error, and increases the reliable identification of factors and factor loadings representative of the constructs being measured. Factor loadings are unstable in small samples. Kerlinger (1986) and Nunnally (1978) recommended ten subjects per item in studies using factor analysis. Having at least ten times as many subjects as variables in factor analysis, the question of sampling error should be

made trivial (Nunnally, 1978). HINTS had 44 items, which indicated a preferred sample of 440 subjects. The investigator sampled 900 subjects and 468 subjects participated in the study. Eighteen responses were deleted due to invalid responses, leaving a final sample of 450 subjects.

Protection of Human Subjects

The present research was a survey of adults using an instrument with no sensitive items. Participants were twenty-one years of age or over, and participation was limited to completion of a paper and pencil instrument (HINTS) and a biographical data form. The investigator complied with the current rules and regulations of the Human Subjects Review Committee at Texas Woman's University. Instructions to the participants included assurance that all information will be kept confidential and anonymous (Appendix B).

Instrument

The instrument used in this study was the Himaya Intuition Semantic Scale (HINTS). The four dimensions of the instrument were developed from a review of the literature and modified from Rew (1988) and Dreyfus and Dreyfus (1985). The original version of the instrument consisted of sixty items. The revised version, based on

incorporating input from a panel of experts who evaluated content validity, consisted of 44 items, and takes approximately 15 minutes to complete. The four dimensions are: (1) wholeness, (2) approximation or subjective certainty, (3) spontaneity, and (4) personalization.

Each item corresponds to one of the major dimensions of intuition. The behaviors described in the responses are based on the description of the characteristics of intuition as depicted in the map for intuition (Figure 2). The review of the literature, discussed in Chapter Two, was used to develop the major dimensions, antecedents, and evidences of intuition. The investigator posited that intuition should be measured on the basis of its own parameters. This means, for example, that intuition would not be assessed by poor recall of sensory data but would be based on a view of the whole, spontaneous awareness, creativity, and nonlinear or nonanalytic synthesis.

The HINTS scale is a self report scale which provides quantitative data on intuition, an abstract concept. The self report method is effective in collecting norm-referenced data (Waltz, et al., 1984). The instructions to the subjects were simple, i.e. they were asked to place an "X" along the scale to represent how they actually see themselves. The items are scaled and the total score is

then summed to obtain an individual's score. The larger the number, the greater the individual fits the descriptive phrase. The higher the score on HINTS, the higher the level of intuition.

Semantic Differential Approach

The semantic differential approach, introduced by Osgood, Suci, and Tannenbaum (1957) was chosen to measure intuition in the present study for several reasons. It does not use extensive wording; and intuition is characterized by the use of metaphors, or nonverbal modes of reasoning. The semantic differential scale also presents a large quantity of data in a concise manner. Osgood, Suci, and Tannenbaum (1957) discuss the advantages and disadvantages of the use of this method of measuring. The advantages include the following: uses an indirect approach, arouses the subject's interest, and generates data that can be placed in specific numerical categories and therefore, treated with statistical techniques. The arousal of the subject's interest contributed to the feasibility of this project in the areas of subject and instrumentation.

Some semantic differential scales use descriptive phrases instead of adjectives, as in the present study. This is another demonstration of the flexibility and

feasibility of the implemented measuring system. The inherent assumption in the selected technique is that meaning can be communicated by phrases and/or adjectives (Osgood, Suci, & Tannenbaum, 1957).

The semantic differential data was considered to be interval data, and the score of the individual is the sum of the scores on all the items of the instrument. This permits, as does norm-referenced frameworks in general, the differentiation among individuals on the trait being measured (Waltz, Strickland & Lenz, 1984).

The semantic differential scale proved to be an adaptable measure and easily constructed (Burns & Grove, 1987). The ease of construction serves the purpose of permitting the future revision(s) of the instrument to increase the reliability and validity estimates. Other advantages are that random reversing of some items decreases the likelihood of global responses, a tendency to answer all questions in the same area on the scale, and also would have demonstrated any tendency toward social desirability answering.

Problems of Measurement

Common problems of measurement are utility, standardization, reliability, and validity (McReynolds, 1978). Classical Test Theory underlies the rules and

assumptions deemed appropriate for various measures and the statistical approaches to assess reliability (Anastasi, 1982; Cronbach, 1970; Gullikesen, 1950). A basic assumption of Classical Measurement Theory is the inevitability of measurement error.

Measurement errors arise from various sources: the subject, the instrument, or the administration of the instrument. Examples of subject error include fatigue, history, and maturation. Examples of instrument error include poor wording, length, or the type of instrument. Examples of administration error include instructions, environment, and timing. Random error results in an increase of the unexplained variance around the mean. Random errors cause difficulties in estimating the true scores. There will always be some random and systematic error in pencil and paper instruments. Methods to control for systematic error include: refinement of the instrument, linking the theoretical concept to the development of the instrument, and using multiple methods of data collection to measure the concept (Burns & Grove, 1987). Control of systematic error was used to increase the validity of the HINTS instrument.

Pilot Study

A pilot study was conducted for this research study. Data analyses were made based on a sample of sixty nurses. This represented approximately a 50% return rate. A biographic and demographic data form (Appendix D) was included in the pilot study. Analysis of data reflected a mean age of the participants in the pilot study of 36 years and a mean income of $56,857. Participants had an average of 14 years of clinical practice. The sample was predominately white (94%), married (77%) and with 1-4 children (72%). Seventy percent of the participants held baccalaureate degrees in nursing. Ninety-four percent of the sample worked in hospitals and special care units. Ninety-two percent (92%) of the sample worked full-time.

The revised HINTS (44 items) was used in the pilot study. An average of 10 items per dimension were included in the revised version. Specifically, there were 10 items on the wholeness dimension, 10 on the approximation dimension, 9 on the spontaneity dimension, and 15 on the personalization dimension. The 44 items were selected as a result of the quantification efforts of the data and input received from the panel of experts. Findings of the pilot study were incorporated in the following sections on validity and reliability.

The discrimination of HINTS was enhanced by revising the instrument based on input from the panel of experts and calculation of the content validity index. Alpha coefficients, on each subscale and on the instrument as a whole, were calculated for the pilot study. Validity and reliability of HINTS were estimated and delineated in the section on validity and reliability of this chapter.

Validity of HINTS

Goodwin and Prescott (1981) clarify the obvious but often neglected fact, by stating:

> ...regardless of the type of research (experimental, correlational, descriptive, and so on), the truth of the findings depends heavily upon the credibility of the measures used in data collection. The two major psychometric properties used to determine credibility are reliability and validity (p. 323).

The following section describes the procedures and findings of the estimation of content validity for HINTS. Construct validity is also discussed.

Content Validity

Validity is the extent to which a instrument actually measures what it is suppose to measure. Validity is never absolute, but a matter of degree. Two questions are asked regarding validity: is it valid for what and is it valid for whom (Waltz & Bausell, 1983). Content validity requires both item and sampling validity. While the

investigator was interested in the predictive value of the instrument to various populations of nurses, the investigator was more interested in whether the instrument really measures the concepts in the intuition paradigm in an efficient and effective manner. Sampling validity addressed representativeness of the norm group to the total population. Sampling validity determined the confidence in generalizability of the findings. The initial version of the HINTS scale, contained sixty investigator-generated items representing four dimensions with a minimum of ten items for each dimension.

Content-related evidence of validity was evaluated during the pilot study. The HINTS was evaluated by individuals who have published extensively on intuition. Fifteen authors included in the review of the literature on intuition and decision making were identified to serve as members of the panel of experts. The experts were asked, as a part of the content validity assessment, to identify areas of omission and to suggest areas for item improvement or modification. The experts were provided with a structured procedure for the evaluation of content validity. Responses from nine, or 60 percent, of the panel of experts were received by the deadline date.

The panel of experts included nine individuals who represented a wide geographic area, eight were from the United States and one from Nova Scotia. Seven different states were represented from the north, south, west, and midwest. Six members of the panel were nurses, four of who held doctoral degrees. Six of the nine held doctoral degrees and the remaining three held masters degrees. Clinical areas of nursing represented included: Psychiatric-Mental Health, Community Health, Maternal Child, and Critical Care.

Lynn (1986) outlined procedures to identify the minimum number of judges who must agree on the item and total instrument for content validity. The procedure identified by Lynn (1986) included:

> ...calculating the proportion of the number of experts who might agree out of the total number,... and then setting the standard error of the proportion to identify, the cutoff for chance versus real agreement (p. 383).

The Content Validity Index (CVI), a most widely used quantification index of content validity, was used in the HINTS scale. CVI was derived from the rating of the content relevance of the items on the instrument using a four point ordinal rating scale, where 1 connotes an irrelevant item and 4 an extremely relevant item. The actual CVI is the proportion of items that received a rating of 3 or 4 by the experts (Waltz & Bausell, 1983).

CVI for items in the revised version of the instrument by dimension ranged between 0.75 - 1.00. CVI for the entire instrument is the proportion of total items judged content valid. CVI for the HINTS scale was 0.73. The breakdown of number and percentage of items endorsed by experts by dimension is included in Appendix E. Approximately 60 percent of the items were endorsed by 86 percent or higher of the experts. One hundred percent of the items on the wholeness dimension were endorsed by 86 percent or higher of the experts. Statistics related to the experts endorsement of HINTS Scale by dimension are included in Appendix E.

The revised HINTS (Appendix C) consisted of 44 items with an average of 10 items per dimension. The 44 items amounted to 73 percent of the 60 items in the original version. Fifteen items, or 35 percent, were randomly reversed. This technique can decrease the likelihood of global responses, a tendency to answer all questions in the same position on the scale and also demonstrate the tendency toward social desirability answering. The initial version consisted of more adjectives/phrases (n=60) than the recommended five items per dimension (Osgood, Suci & Tannenbaum, 1957).

The 44 items in the revised scale were selected as a result of the quantification efforts of the data and input received by the panel of experts. Items that did not achieve the required minimum agreement of the experts were deleted. Nine experts (60% of the original list) responded with data and suggestions. The minimum number of judges required for agreement with the items and the total instrument was established to be at least 75 percent, for estimation of content validity. Appendix F includes data summary related to the experts endorsement of the revised version of the instrument. The percentage of experts whose endorsement was required to establish content validity beyond the .05 level of significance ranged between 0.86 - 1.00 for the 44 items selected.

Experts identified no additional dimensions to those four identified in the instrument. The instrument was judged content valid by the experts. In conjunction with the knowledge of the high magnitude of the CVI values, the content validity of the HINTS scale was asserted.

Construct Validity

Cronbach and Meehl (1955), who first introduced the idea of construct validation, asserted construct validity should be examined whenever there is lack of agreement as to which components adequately define a conceptual domain and what dimensions of the concept are being measured.

This describes intuition and the intuitive process (Young, 1987; Rew, 1986; Gerrity, 1987).

Factor analysis is one of the major statistical methodologies for investigating construct validity because it will identify which items relate to each other and thereby, will delineate the salient dimensions of a concept (Nunnally, 1978). When factor analysis is used to examine hypothetical constructs, the type of construct validation is called factorial validity (Moore, 1983).

Due to the limited sample size in the pilot study, factor analysis was performed only to assess the feasibility of finding clusters and evaluate the computer program written to perform this analysis on the main study.

Reliability of HINTS

Reliability is defined in terms of stability, equivalence, and homogeneity (Burns & Grove, 1987). Reliability is the consistency with which the instrument measures whatever it measures (Nunnally, 1978). An instrument or measure could be reliable without being valid. Reliability is the extent to which a measure consistently measures the same way under similar circumstances. Consistency of circumstances is an important feature of reliability. Reliability is a function of random error and is influenced by problems

with the instrument, (i.e. ambiguous wording), the subject, (i.e. fatigue or distraction), and with scoring of the instrument (Nunnally, 1978).

For the purpose of this study the reliability of HINTS was estimated using Cronbach's alpha correlation coefficient. According to Nunnally (1978), Cronbach's alpha correlation coefficient is recommended over test/retest reliability procedures in determining homogeneity (internal consistency) of an instrument. Kerlinger (1986) defined internal consistency (homogeneity) in terms of the extent to which all items on a scale or subscale measure the same attribute. Internal consistency of each subscale and the total instrument was evaluated by item analysis, and alpha coefficients. Cronbach's alpha coefficient gives the overall measure of the consistency with which the score on an item can predict the attribute being measured (Waltz, et al., 1984). Kerlinger (1986) stated that internal consistency must be estimated before an instrument can be used in research studies.

Cronbach's alpha has the following advantages as a measure of internal consistency. It (1) uses a single sample, (2) is highly accurate, (3) is easily programmed for computer analysis, and (4) provides information on which to base decisions for item deletion and/or revision

to increase scale and subscale reliability (Kerlinger, 1986).

Interval level data were collected using HINTS during the pilot study and the research study. The RELIABILITY computer program in SPSS-X was used to determine the internal consistency reliability of HINTS. Alpha correlation coefficients were determined for each of the four subscales and the total HINTS instrument. The alpha correlation coefficients for each subscale and the total HINTS for the pilot study are presented in Table 1.

The reliability coefficients of HINTS (total instrument) in the pilot study was 0.8789. The reliability coefficients for the subscales in HINTS ranged from 0.5766 for the personalization dimension to 0.7544 for the wholeness dimension. According to Nunnally (1978), the desired alpha for a new instrument is 0.70. Considering the sample size of 60 for the pilot study, the alpha for the total instrument and three of the four subscales were promising, and warranted further investigation.

Table 1

Initial Alpha Correlation Coefficients of HINTS (N=44) by Dimension in the Pilot Study

Dimension	N	Initial Version Alpha
Wholeness	10	.7544
Approximation	10	.6896
Spontaneity	9	.6641
Personalization	15	.5766
(Total Instrument) HINTS	44	.8789

Anastasi (1982) and Nunnally (1978) suggested several procedures to increase alpha coefficients for the subscales and the overall instrument. The first suggestion was the deletion of low correlating items. Deleting the low correlating items was not the first option in the case of the pilot study of HINTS because HINTS had only 44 items. Nunnally (1978) reported a low alpha indicates the test is too short or the items have little in common. The second option was the deletion of, or rewriting of, the subscale with a low alpha. The personalization subscale, the subscale with the lowest alpha, is considered to be an essential dimension of intuition. The investigator chose not to delete the personalization dimension. The third option suggested was to estimate the reliability on a larger population. The sample in the present study consisted of 450 nurses which

was approximately seven times the size of the pilot study. The fourth option was to increase the number of items in the instrument (Nunnally, 1978). The investigator selected not to implement this option in an effort to keep the instrument brief and succinct. Efforts were made during the pilot study to assess the advantages of decreasing the number of items in the instrument, and having significantly high alpha versus having an instrument with 44 items and a reasonably high alpha. The investigator decided to keep the 44 items on HINTS for the main study.

Data Collection

All data were collected by written instrument and were coded by the investigator. Data were collected from responses to a questionnaire mailed to 900 registered nurses in a southern state. The minimum required responses were 440 nurses. Random numbers were used to identify the 900 registered nurses from all registered nurses (N=31,003) listed in the 1990 directory of registered nurses in a southern state. The mailing included HINTS, a cover letter requesting participation in the study, simple instructions to complete the HINTS, and a self-addressed, stamped envelope. Participants were assured confidentiality. The cover letter included the address and telephone number of the investigator to enable

participant(s) to contact the investigator for clarification of any aspect of HINTS (Appendix B). The investigator sent a follow-up reminder to the participants to assure receipt of the required sample of 440 nurses. Incomplete or invalid responses were discarded.

Treatment of Data

Descriptive correlational statistical analyses were used to analyze the data. Data were coded and entered into a data file for computer analysis, using SPSS-X statistical programs. Internal consistency (reliability) was estimated by Cronbach's alpha correlation coefficients. Cronbach's alpha coefficient correlates each individual item with each other item and the overall score, thus providing the overall measure of consistency with which the score on an item can predict the overall attribute being measured. Adequate Cronbach alpha correlation coefficient is equal to or greater than 0.70 for total new instruments (Nunnally, 1978). The higher the alpha coefficient, the higher the reliability of the attribute being measured.

Pearson correlation coefficients were computed on the subscales to total instrument. Desired correlation coefficients should be between 0.80 and 0.90. Item to total correlations should be between 0.30 and 0.70. Factor analysis with the criteria of 4 items loading at or

above 0.50 on each factor was used to estimate construct validity (Nunnally, 1978). The factor loadings revealed the degree of relationship between the items and revealed the concepts which explained the overall construct of intuition.

Summary

The HINTS, a new instrument to measure intuition, was described. The initial revised version of HINTS in the pilot study consisted of 44 items. Methods to estimate validity and reliability were delineated. Content validity was supported by extensive review of the literature and by using a panel of experts.

A pilot study was conducted for 60 nurses in a southern state. Alpha correlation coefficients for each dimension and for the total instrument were computed. Methods to increase the alpha coefficients were discussed. The results of the alpha correlations coefficients provided preliminary evidence of internal consistency for HINTS.

Step by step, descriptions for data collection and data treatment were included. The sample for the current study was 450 registered nurses in a southern state. RELIABILITY and FACTOR programs in SPSS-X were used for the research study. The research design was described and methodological procedures were identified.

CHAPTER IV

ANALYSIS OF DATA

A methodological study for the purpose of estimating psychometric properties of the Himaya Intuition Semantic Scale (HINTS) to measure intuition in nurses was conducted. Estimates of the reliability and validity of the investigator-developed instrument were obtained. The data analysis was performed in stages, and a revised instrument was proposed for further research. The stages of revision and findings at each stage are described in detail in this chapter. The hypotheses are discussed in light of the findings.

Description of Sample

The sample consisted of 450 nurses listed in the 1990 directory of all licensed registered nurses in a southern state. Nine-hundred instruments were mailed; 468 (52%) of these were returned by the deadline date. Eighteen of these instruments were incomplete or invalid and were, therefore, discarded. The data were collected over a period of three months. Demographic data, including age, gender, race, income, marital status, and education level, are presented in Table 2. The sample was predominately female (94.4%), married (76.7%), white (94.7%), lived with

spouse and children (48.9%), and were employed full-time (78%), in hospitals (72.5%). The mean age of the participants in the current study was 39.1 years; the ages ranged from 23 to 72 years. Twenty-five (6%) of the subjects were male. A modest three percent (3.2%) of the sample were black, and 2.2% represented other minorities as Asians, American Indians, and Hispanics.

Seventy-eight percent of the research sample worked full-time while six percent were unemployed or retired. Seventy-five percent reported having patient contact "most of the time". Seven percent reported "rarely or never" for patient contact. The participants had a mean of 13.3 years of clinical experience. The largest single area of practice reported was medical surgical nursing (21.5%). The next highest areas of practice were maternal-child (13.3%) and intensive care units (12.6%). The educational level of participants in the sample ranged from a diploma (20.2%), associate degree (23.7%), baccalaureate degree in nursing (40%) to doctorate degrees (1.4%).

The majority of the subjects (76.7%) were married. Eight percent were single. Subjects who reported being divorced, separated, or widowed (15.3%) constituted the remainder of the group. Twenty-two percent of the sample had no children while 34.7% had two children, and 29.8%

had three or more children. Forty-nine percent lived with spouse and children, and 28% lived with spouse. The mean family income was $60,684 per year. Fifty-two percent of the sample reported income equal to or greater than $65,000.

In summary, the majority of the subjects were caucasian, married, females, living with children and spouses. The total average family income was more than $60,000 per year. Full-time employment in hospitals and an average of more than 13 years of clinical practice describe the characteristics of the participants' clinical experiences. Employment and clinical characteristics are presented in Table 3.

Summary Statistics

Normative statistics for selected characteristics of the research sample and for HINTS are included in Tables 5 and 6. Data include mean, standard deviation, range and variance for each item and for each subscale. The data are useful in interpretation and explanation. The mean of HINTS was 94.6 with a range of 38-171 (a moderate to high measure of dispersion of scores around the mean), indicating that individuals varied their responses to the items. The subscale with the lowest alpha also had the highest mean and the highest standard deviation.

Table 2

Demographic Data of Research Sample

Variable	Frequency	Percent
Gender		
Male	25	5.6
Female	425	94.4
Race/Ethnicity		
White	426	94.7
Black	16	3.5
Hispanic/Spanish	4	.9
Asian or Pacific Islander	3	.7
American Indian/ Alaskan Native	1	.2
Marital Status		
Never Married	36	8.0
Married	345	76.7
Divorced	49	10.9
Separated	16	3.5
Widowed	4	.9
Age		
25 or less	25	5.6
26 - 29	52	11.6
30 - 34	89	19.7
35 - 39	104	23.2
40 - 44	59	13.1
45 - 49	48	10.7
50 - 59	56	12.6
60 - 64	8	1.7
65 - 72	9	1.8

(table continues)

Variable	Frequency	Percent
Number of Children		
0	99	22.0
1	61	13.6
2	156	34.6
3	90	20.0
4	30	6.7
5 - 9	14	3.1
Living Arrangement		
Alone	44	9.8
With Spouse	119	26.4
With Children	49	10.9
With Spouse and Children	220	48.9
With Parents	8	1.8
With Other Relatives	2	.4
With Friends	8	1.8
Family Income per Year		
LESS THAN $30,000	32	7.1
$30,000 - 49,999	143	31.8
$50,000 - 59,999	63	14.0
$60,000 - 79,999	123	27.4
$80,000 - 100,000	61	13.5
MORE THAN $100,000	28	6.2

Table 3

Education and Employment Characteristics of the Research Sample

Variable	Frequency	Percent
Highest Degree Earned		
Diploma in Nursing	93	20.7
Associate Degree in Nursing	105	23.3
Baccalaureate Degree in Nursing	183	40.7
Baccalaureate Degree in Other Areas	19	4.2
Masters Degree in Nursing	32	7.1
Masters Degree in Other Areas	13	2.9
Doctorate Degree in Nursing	4	0.9
Doctorate Degree in Other Areas	1	0.2
Current Employment		
Full-Time	350	77.8
Part-Time	73	16.2
Unemployed	18	4.0
Retired	9	2.0
Place of Current Employment		
Hospital	326	72.5
Special Care Units	19	4.2
Community Health Centers	9	2.0
Private Practice	10	2.2
Extended Care Units	5	1.1
Others	81	18.0

(table continues)

Variable	Frequency	Percent
Years of Clinical Practice		
0 - 5	114	25.3
6 - 9	48	10.7
10 - 14	123	27.3
15 - 19	74	16.5
20 - 24	37	8.2
25 - 29	21	4.7
30 - 34	15	3.3
35 - 39	9	2.0
40 - 44	2	.4
45 - 49	2	.4
50 - 51	5	1.2
Level of Current Practice		
Staff Nurse	235	52.2
Head Nurse	42	9.3
Supervisor	59	13.1
Private Practice	6	1.4
Clinical Specialist	14	3.1
Others	94	20.9
Area of Current Clinical Practice		
Psychiatric Nursing	35	7.8
Medical - Surgical Nursing	88	19.6
Maternal - Child Nursing	60	13.3
Community Health	21	4.7
Pediatrics	18	4.0
Intensive Care	57	12.6
Gerontology	10	2.2
Others	161	35.8
Frequency of Patient Content		
Most of time	338	75.1
Sometimes	80	17.8
Rarely	25	5.6
Never	7	1.5

Table 4

Mean, Standard Deviation, and Range for Selected Characteristics of the Research Sample

Variable	Mean	Standard Deviation	Range	Variance
Age	39.12	10.07	23 - 72	101.50
Income (family income per year)	$60,685	$32,233	$10,000-$312,000	-
Years of Clinical Practice	13.30	9.40	1 - 51	88.80

Table 5

Mean, Standard Deviation, and Range of HINTS and its Four Subscales

Subscale	No. Items	Mean	Item Mean	Standard Deviation	Range	Variance
Hints	44	94.5	2.15	21.8	38 - 171	477.10
Wholeness	10	31.7	3.17	7.7	8 - 55	59.29
Approximation	10	30.0	3.00	7.0	3 - 51	49.62
Spontaneity	9	26.4	2.93	6.5	6 - 45	51.82
Personalization	15	51.6	3.44	8.9	20 - 83	70.75

Table 6

Mean, Standard Deviation, and Variance for Each Item on HINTS and its Four Subscales

Scale Item	Mean	Standard Deviation	Variance
Wholeness (n=10)	31.73	7.70	59.28
5.	3.53	1.49	2.21
10.	3.62	1.43	2.05
15.	2.73	1.33	1.76
20.	2.68	1.56	2.45
25.	3.18	1.58	2.49
30.	3.36	1.59	2.52
35.	3.73	1.36	1.84
37.	3.00	1.39	1.94
40.	3.27	1.45	2.11
44.	2.64	1.42	2.00
Approximation (n=10)	30.03	7.04	49.62
1.			
6.	3.02	1.64	2.69
11.	3.12	1.32	1.73
16.	2.36	1.20	1.44
21.	3.23	1.53	2.33
26.	2.47	1.39	1.93
31.	3.88	1.35	1.83
36.	2.83	1.39	1.92
42.	3.92	1.40	1.95
43.	2.64	1.42	2.01

(table continues)

Scale Item	Mean	Standard Deviation	Variance
Spontaneity (n=9)	28.39	7.20	51.52
2.	3.40	1.66	2.74
7.	2.66	1.53	2.35
8.	1.99	1.35	1.81
12.	2.70	1.42	2.02
17.	2.98	1.57	2.46
22.	4.47	1.46	2.13
27.	3.52	1.62	2.62
28.	3.30	1.12	1.25
32.	3.36	1.52	2.31
Personalization (n=15)	49.63	8.41	70.75
3.	3.43	1.53	2.35
4.	2.45	1.45	2.11
9.	2.98	1.60	2.57
13.	2.96	1.37	1.89
14.	3.57	1.53	2.34
18.	3.07	1.48	2.20
19.	3.31	1.56	2.45
23.	3.41	1.39	1.93
24.	2.78	1.53	2.34
29.	3.92	1.43	2.04
33.	4.33	1.19	1.41
34.	3.06	1.37	1.88
38.	3.48	1.53	2.34
39.	4.06	1.53	2.34
41.	2.81	1.48	2.17

Findings

The purpose of the present study was to examine the reliability and validity of the Himaya Intuition Semantic Scale (HINTS), a newly developed instrument to measure intuition. Cronbach's alpha correlation coefficient was used to determine the internal consistency reliability of HINTS and each of its four subscales. Hypotheses one and two were tested using Cronbach's alpha correlation coefficients. Hypothesis three was tested using the item/total correlation obtained in the RELIABILITY program of SPSS-X. HINTS was revised as a result of the findings from internal consistency. Hypothesis four was tested to estimate construct validity of HINTS using exploratory factor analysis. Procedures and findings are delineated in the following section.

Initial Reliability of HINTS

The original HINTS was revised as a result of the findings from the panel of experts. The first revised version of HINTS consisted of 44 items and was divided into four subscales. Wholeness, approximation, spontaneity, and personalization are the four subscales. Fifteen negative scores were converted to positive scores via the "Recode" command, and scores were all recorded as positive. Items on HINTS were grouped into the four

subscales for computer analysis. The SPSS-X computer program RELIABILITY was used to determine reliability. Cronbach's alpha correlation coefficient was used to determine the internal consistency reliability of HINTS and its four subscales. The results of the initial analysis for internal consistency, each subscale, and for the total HINTS are summarized in Table 7. The initial alpha correlation coefficient for HINTS (N=44) was 0.8728. The initial alpha correlation coefficients for the subscales ranged from 0.5814 for the personalization subscale to 0.7105 for the wholeness subscale.

Table 7

Initial Alpha Correlation Coefficients for HINTS and its Four Subscales

Subscale	No. Items	Alpha
Total Instrument (HINTS)	44	.8728
Wholeness	10	.7105
Approximation	10	.6745
Spontaneity	9	.6977
Personalization	15	.5814

Tables 8-11 include alpha correlation coefficients for each of the four subscales. Data in each table include corrected item/total correlation for each item,

alpha of subscale if item was deleted, and alpha of total scale if item was deleted.

Table 8

Initial Alpha Correlation Coefficients for the Wholeness Subscale of HINTS (n=10)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
5.	.1834	.7189	.8723
10.	.4241	.6790	.8672
15.	.3862	.6859	.8698
20.	.5178	.6607	.8677
25.	.4556	.6724	.8675
30.	.2186	.7152	.8710
35.	.4062	.6826	.8682
37.	.4179	.6804	.8692
40.	.2835	.7023	.8710
44.	.4266	.6788	.8681

Wholeness Subscale Alpha Coefficient .7105

Table 9

Initial Alpha Correlation Coefficients for the Approximation Subscale of HINTS (n=10)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
1.	.4725	.6262	.8677
6.	.3725	.6435	.8701
11.	.2854	.6598	.8707
16.	.3606	.6474	.8694
21.	.4126	.6346	.8658
26.	.5198	.6144	.8672
31.	.0032	.7086	.8748
36.	.3989	.6386	.8683
42.	.2903	.6593	.8698
43.	.2701	.6633	.8718

Approximation Subscale Alpha Coefficient .6745

Table 10

Initial Alpha Correlation Coefficients for the Spontaneity Subscale of HINTS (n=9)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
2.	.3974	.6670	.8674
7.	.6346	.6154	.8661
8.	.4411	.6599	.8677
12.	.5844	.6303	.8664
17.	.4813	.6488	.8664
22.	.0430	.7319	.8743
27.	.3090	.6859	.8701
28	.1918	.7004	.8724
32.	.2960	.6872	.8698

Spontaneity Subscale Alpha Coefficient .6977

Table 11

Initial Alpha Correlation Coefficients for the Personalization Subscale of HINTS (n=15)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
3.	-.0204	.6081	.8755
4.	.2631	.5565	.8703
9.	.4947	.5070	.8700
13.	.3891	.5350	.8676
14.	.4489	.5191	.8714
18.	.4640	.5176	.8671
19.	.3459	.5394	.8732
23.	.1011	.5844	.8743
24.	.1240	.5822	.8724
29.	.2993	.5502	.8686
33.	-.0058	.5971	.8751
34.	-.0904	.6144	.8780
38.	-.4358	.5218	.8666
39.	-.0028	.6048	.8775
41.	.0720	.5906	.8719

Personalization Subscale Alpha Coefficient .5814

Interim Reliability of HINTS (N=25)

In order to increase the overall alpha correlation coefficients of each subscale, and the total instrument, items with the lowest correlation in each subscale were deleted. Shelly (1984) recommended deleting items with lower than 0.20 correlation coefficients. However, the overall alpha correlation coefficients of the total instrument and each subscale were decreased by keeping items with item to total correlations below 0.30. Therefore, items (n=19) with correlations below 0.30 were deleted. The interim analysis was based on the revision obtained by deleting all items with correlations below 0.30. Table 12 includes improved alpha for HINTS (N=25) and for its four subscales.

Table 12

Alpha Correlation Coefficients for HINTS and its Four Subscales After Second Revision

Scale/Subscale	N-Items	Alpha
HINTS	25	.8857
Wholeness	7	.7295
Approximation	6	.7070
Spontaneity	6	.7406
Personalization	6	.7251

Alpha for HINTS was 0.8857 compared to the initial alpha of 0.8728. Alpha for each subscale also improved. Alpha ranged from 0.7070 for the approximation subscale to 0.7406 for the spontaneity subscale. The largest increase in alpha was for the personalization subscale. It increased from 0.5814 to 0.7251. The lowest increase in alpha was for the wholeness subscale. It increased from 0.7105 to 0.7295. In addition, alpha for the spontaneity subscale increased from 0.6977 to 0.7406. The reliability of the approximation subscale increased from 0.6745 to 0.7070. Tables 13-16 include alpha correlation coefficients for each of the revised four subscales.

Table 13

Alpha Correlation Coefficients for the WHOLENESS Subscale After Second Revision (n=7)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
10.	.4161	.7038	.8801
15.	.4190	.7031	.8822
20.	.5408	.6720	.8798
25.	.4768	.6892	.8811
35.	.3766	.7123	.8816
37.	.4190	.7030	.8815
44.	.4356	.6992	.8809

Wholeness Subscale Alpha Coefficient .7295

Table 14

Alpha Correlation Coefficients for the Approximation Subscale After Second Revision (n=6)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
1.	.5154	.6460	.8800
6.	.2780	.7263	.8870
16.	.5271	.6460	.8813
21.	.3406	.7007	.8782
26.	.6036	.6147	.8795
36.	.4412	.6669	.8809

Approximation Subscale Alpha Coefficient .7070

Table 15

Alpha Correlation Coefficients for the Spontaneity Subscale After Second Revision (n=6)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
2.	.3755	.7350	.8813
7.	.6238	.6607	.8782
8.	.4971	.7002	.8793
12.	.6085	.6689	.8783
17.	.4858	.7014	.8783
27.	.3183	.7501	.8837

Spontaneity Subscale Alpha Coefficient .7406

Table 16

Alpha Correlation Coefficients for the Personalization Subscale After Second Revision (n=6)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
9.	.5085	.6716	.8858
13.	.3871	.7068	.8799
14.	.5068	.6726	.8880
18.	.5173	.6700	.8797
19.	.3697	.7140	.8906
38.	.4658	.6851	.8792

Personalization Subscale Alpha Coefficient .7251

Construct Validity and Factor Analysis

Construct validity of HINTS was estimated using exploratory factor analysis. All 25 items in the revised version of HINTS were pooled and subjected to factor analysis. The principal component method was selected. Nunnally (1978) recommended the use of principal component analysis plus varimax rotation with at lease 20 variables in exploratory factor analysis. The SPSS-X program FACTOR was used. A "Sort" command was used to sort item loadings by factor in descending order.

Factors extracted were rotated using both oblique and varimax (orthogonal) rotations. The oblique rotation assumes the factors are correlated while the varimax rotation assumes the factors are uncorrelated (Ferketich & Muler, 1990). The factor matrix indicated that the factors were uncorrelated. Therefore, the varimax rotation was selected. The varimax allows for more factors; however, it maximizes the loading on one factor and minimizes loading on all other factors. The advantage of the varimax is the extracted factors have a greater number of items that load only on those factors (Ferketick & Muler, 1990). A significant factor loading criteria was set at a minimum of 0.50. If an item is loaded on more than one factor, then the factor which had the highest

loading was selected. The minimum number of items loading on a single factor was set at four (Nunnally, 1978). Guttman's criteria of an eigenvalue of greater than 1.0 was used to determine the number of factors to be interpreted (Guttman, 1954). Table 17 includes the extracted factors, eigenvalues, percentage of variance contributed by each factor, and the cumulative percentage of variance. Any item(s) failing to meet the specified criteria were deleted from HINTS.

Table 17

Eigenvalues and Percentages of Variance for Factors (N=450)

Factor	Eigenvalue	% of Variance	Cumulative %
1	7.25	29.0	29.0
2	2.42	9.7	38.7
3	1.46	5.8	44.5
4	1.25	5.0	49.5
5	1.04	4.2	53.7

The varimax, an orthogonal rotation, in the exploratory factor analysis procedure extracted six factors. Factor six had only one item (item #6) with a loading of 0.81. The item, as well as the factor, was deleted. Five factors that met the specified criteria

remained. Items were clustered or grouped by factor and subscale. The five factors contained four items or more, and each item had a loading of 0.50 or greater. Loadings of less than 0.30 should not be taken seriously, because they represent less than 10% of the variance (Nunnally, 1978). The results of the principal components factor analysis (the extracted factors, loadings of each item on the factor, and communalities) are included in Tables 18 and 19. Items in Table 18 are limited to those with loading of 0.30 or above. Items in Table 19 are limited to those with loadings of 0.50 or above. Items were grouped by subscale for easier interpretation. The following summarizes the item loadings on factors (Table 19):

1. Factor one had four items with loading ranges from 0.61 to 0.77. Three (75%) of these items (16, 26, 36) were in the approximation subscale. The remaining one item (17) was on the spontaneity subscale.

2. Factor two had seven items with loading ranges from 0.50 to 0.58. Five (72%) of these items (20, 25, 35, 37, 44) were on the wholeness subscale. An additional item (27) was on the spontaneity subscale, and the remaining item (38) was on the personalization subscale.

3. Factor three had five items (7, 8, 12, 13, 15) with loading ranges from 0.55 to 0.66. Three (60%) of these items (7, 8, 12) were on the spontaneity subscale. An additional item (15) was on the wholeness subscale, and the remaining item (13) was on the personalization subscale.

4. Factor four had four items (9, 14, 18, 19) with loading ranges from 0.51 to 0.80. All these items (n=4) were on the personalization subscale.

5. Factor five, the last factor, had four items (1, 21, 10, 2) with loading ranges from 0.51 to 0.75. Two of these items (1, 21) were on the approximation subscale, and an additional item (10) was on the wholeness subscale. The remaining item (2) was on the spontaneity subscale.

By adding the criterion of having a minimum of three items per factor for a single subscale, factor five can be ignored and this supports a four factor model. In other words, items in the approximation subscale load only on the first factor; items on the wholeness subscale load only on the second factor; items on the spontaneity subscale load only on the third factor; and items in the personalization subscale load only on the fourth factor. This supports a four factor model of intuition as proposed in this study.

Items were clustered by factor or subscale except for factor five. This can be explained by the possibility that in intuition, there are items that reflect more than one of the four components (wholeness, approximation, spontaneity, and personalization). Interaction between the subscales may contribute to the presence of the fifth factor. The first four factors are the strongest, each accounted for more than five percent (5%) of the variance. The fifth factor accounted for four point two percent (4.2%) of the variance. If one chooses a minimum of 5% variance explained as a cut-off to identify a factor, then the proposed four factor model was supported. Items in the matrix are limited to those with a 0.50 or more loading. According to Nunnally (1978), identified factors should have at least four items or more with 0.50 or greater loadings. The five factors presented in Table 19 met the criterion stated by Nunnally.

In summary, all subscales loaded three items or more on the major factors. The factor loadings for the items were fairly correlated; the lowest loading was 0.50, and the highest loading was 0.80. The majority of the items had factor loadings of 0.60 or greater. Rotated factor matrices for factors one through six and for factors one through five and communalities (h^2) are presented in Tables 18 and 19.

Table 18

Rotated Factor Matrix: Factors 1-6 (N=450)*

Item #	Factor 1	2	3	4	5	6	h^2
1. Approximation							
16	**.78**						.70
36	**.62**						.48
26	**.61**	.33				.36	.66
21		.44			.53		.58
1	**.48**				.51		.59
6						.81	.73
2. Wholeness							
25		**.58**					.51
44		**.56**					.46
20	.42	**.55**					.58
35		**.50**			.39		.49
37	.33	**.50**					.39
15			.55				.50
10					.67		.57
3. Spontaneity							
17	.74						.68
27		.50			.41		.50
7			**.66**				.66
12	.39		**.60**				.59
8	.41		**.57**				.55
2					.75		.63
4. Personalization							
35		.54	.36	.36			.62
13			.58				.55
14				**.80**			.69
9				**.72**			.57
19				**.69**			.49
18			.31	**.51**			.59

*Items included are limited to those items with loading of 0.30 and greater.

Note: The clusters that support the subscale(s) are in boldface type.

Table 19

Rotated Factor Matrix: Factors 1 - 5 (N=450)*

Item #	Factor 1	2	3	4	5	h^2
1. Approximation						
16	**.77**					.70
36	**.62**					.48
26	**.61**					.66
21					.53	.58
1					.51	.59
6						.73
2. Wholeness						
25		**.58**				.51
44		**.56**				.46
20		**.55**				.58
35		**.50**				.49
37		**.50**				.39
15			.55			.50
10					.67	.57
3. Spontaneity						
17	.74					.68
27		.50				.50
7			**.66**			.66
12			**.60**			.59
8			**.57**			.55
2					.75	.63
4. Personalization						
38		.53				.62
13			.58			.55
14				**.80**		.70
9				**.72**		.57
19				**.69**		.49
18				**.51**		.59

*Items included are limited to these with loading of 0.50 and greater.

Note: The clusters that support the subscale(s) are in boldface type.

Final Reliability of HINTS

The findings of factor analysis resulted in the deletion of one item (item #6). Item #26 was deleted from factor six because its loading (0.36) was below the criteria of 0.5 loading. Item number six was the only item loaded on factor six, and the only item with an item/total correlation below 0.30. Therefore, item six and factor six were deleted. The final revised instrument was subjected again to the SPSS-X RELIABILITY program to measure alpha for the instrument and its four subscales.

Deleting item six from the instrument had the effect of increasing alpha for the approximation subscale from 0.7070 to 0.7263 and alpha for the total HINTS from 0.8857 to 0.8870. Deleting item six had no effect on the alpha coefficients for the remaining subscales. The resulting alpha coefficients for HINTS and each subscale are presented in the following table.

Table 20

Final Alpha Correlation Coefficients for Hints and its Four Subscales

Scale/Subscale	N-Items	Alpha
HINTS (Total Instrument)	24	.8870
Wholeness	7	.7295
Approximation	5	.7263
Spontaneity	6	.7406
Personalization	6	.7251

Pearson correlation coefficients between HINTS (total instrument) and each of its four subscales were: 0.8756 for the spontaneity subscale, 0.8623 for the wholeness subscale, 0.8285 for the approximation subscale, and 0.6606 for the personalization subscale. Desired correlation coefficients should be between 0.80 and 0.90 (Nunnally, 1978).

The final version of HINTS consists of 24 items (Appendix G). Each item had an item/total correlation between 0.32 and 0.62. The lowest item/total correlation is 0.3183 for item 27, and the highest item/total correlation is 0.6238 for item seven. The final alpha for HINTS was 0.8870 and the final alpha for the subscales ranged between 0.7251 for the personalization subscale to 0.7406 for the spontaneity subscale. These values are higher than those values proposed in hypotheses one and two. The final reliability results of all items on HINTS (N=24) by subscale are presented in Tables 21-24.

Table 21

Final Alpha Correlation Coefficients
for the Revised Wholeness Subscale (n=7)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
10	.4161	.7038	.8816
15	.4190	.7031	.8833
20	.5408	.6720	.8810
25	.4768	.6892	.8826
35	.3766	.7123	.8828
37	.4190	.7030	.8827
44	.4356	.6992	.8823

Final Wholeness Subscale Alpha Coefficient .7295

Table 22

Final Alpha Correlation Coefficients
for the Revised Approximation Subscale (n=5)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
1	.5305	.6634	.8814
16	.5617	.6554	.8826
21	.3413	.7429	.8794
26	.5523	.6527	.8813
36	.4812	.6816	.8821

Final Approximation Subscale Alpha Coefficient .7263

Table 23

Final Alpha Correlation Coefficients
for the Revised Spontaneity Subscale (n=6)

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
2	.3755	.7350	.8814
7	.6238	.6607	.8796
8	.4971	.7002	.8806
12	.6085	.6689	.8796
17	.4858	.7014	.8799
27	.3183	.7501	.8849

Final Spontaneity Subscale Alpha Coefficient .7406

Table 24

Final Alpha Correlation Coefficients
for the Revised Personalization Subscale (n=6).

Item #	Corrected Item/Subscale Correlation	Alpha Subscale if Item Deleted	Alpha Total Scale if Item Deleted
9	.5085	.6716	.8875
13	.3871	.7068	.8810
14	.5068	.6726	.8899
18	.5173	.6700	.8806
19	.3697	.7140	.8923
38	.4658	.6851	.8803

Final Personalization Subscale Alpha Coefficient .7251

Three Stages of Analysis (Summary)

The analysis of the present study is summarized in three stages: stage one was for the initial analysis of internal consistency of HINTS with 44 items. The second analysis (stage two) was for HINTS with 25 items. Items with low (below 0.3) item/total correlations were deleted in the second stage. The third analysis (stage three) included further deletion of item(s) failing to meet factor loading criteria. The third stage also included the recalculation of alpha coefficients for HINTS and its four subscales. At the conclusion of the third stage, it was determined that the maximum reliability attainable was established for HINTS and for each subscale for the present study while retaining the maximum number of items per subscale.

The internal consistency correlation coefficients for the three stages of instrument analysis are presented in Table 25. The final version of HINTS (N=24) by subscale, item/total correlation of each item, and factor loading as found in the factor analysis in stage two is delineated in Table 26. The final version of HINTS (N=24) is included in Appendix G.

Table 25

Alpha Correlation Coefficients for HINTS and its Four Subscales: Comparison of Three Stages

Scale/ Subscale	N Items	ALPHA Analysis #1	ALPHA Analysis #2	ALPHA Analysis #3
HINTS	44	.8728	-	-
	25	-	.8857	-
	24	-	-	.8870
1. Wholeness				
	10	.7105	-	-
	7	-	.7295	-
	7	-	-	.7295
2. Approximation				
	10	.6745	-	-
	6	-	.7070	-
	5	-	-	.7263
3. Spontaneity				
	9	.6977	-	-
	6	-	.7406	-
	6	-	-	.7406
4. Personalization				
	15	.5814	-	-
	6	-	.7251	-
	6	-	-	.7251

Table 26

Final Version of HINTS (N=24) by Subscale, Item/Total Correlation, and Loadings on Identified Extracted Factors

Item		Corrected Item/Total Correlation	Factor Loading	Factor M*	Factor O*
A. Approximation (n=5)					
1.	Facts.....Hunches	.531	.51		5
16.	Comprehensive data.....Minimal data	.562	**.78**	**1**	
21.	Facts.....Ideas/Principles	.341	.53		5
26.	Precise.....Ambiguous	.552	**.61**	**1**	
36.	Analytical.....Abstract	.481	**.62**	**1**	
B. Wholeness (n=7)					
10.	All the data.....Relationships	.416	.67		5
15.	Focus on total data.....Focus on gaps	.419	.55		3
20.	Clear relationships.....Hidden relationships	.541	**.55**	**2**	
25.	Literal.....Figurative	.477	**.58**	**2**	
35.	Recite.....Experiential	.377	**.50**	**2**	
37.	Analysis.....Synthesis	.419	**.50**	**2**	
44.	Known.....Unknown	.436	**.56**	**2**	

(table continues)

Item	Corrected Item/Total Correlation	Factor Loading	Factor M*	Factor O*
C. Spontaneity (n=6)				
2. Rules/Policies.....Ideas/Principles	.376	.75		5
7. Structure.....Unstructured	.624	**.66**	**3**	
8. Reality.....Fantasy	.497	**.57**	**3**	
12. Planned.....Unplanned	.609	**.60**	**3**	
17. Systematic.....Spontaneous	.486	.74		1
27. Procedures.....Guidelines	.318	.50		2
D. Personalization (n=6)				
9. Creative.....Practical	.509	**.72**	**4**	
13. Explanation.....Discovery	.387	.58		3
14. Create.....Make	.507	**.80**	**4**	
18. Build.....Invent	.517	.51		
19. Design.....Production	.370	**.69**	**4**	
38. Routine.....Brainstorm	.466	.54		2

M*: The major factors
O*: Other factors

Synthesis of Findings and Research Hypotheses

Synthesis of findings resulted in conclusions regarding the four hypotheses of the research study. The following section addresses the conclusions regarding the research hypotheses.

Hypothesis one (H_1): The internal consistency of the HINTS is equal to or greater than 0.70.

The internal consistency reliability coefficient of the HINTS was 0.8870. Based on this statistical finding, the first hypothesis was accepted.

Hypothesis two (H_2): The internal consistency coefficients for each of the HINTS subscales (wholeness, approximation, spontaneity, and personalization) are equal to or greater than 0.60.

The internal consistency reliability coefficients of the four subscales of HINTS ranged between 0.7251 and 0.7406. Based on these statistical findings, the second hypothesis was accepted.

Hypothesis three (H_3): Item to total correlations of all items are between 0.30 and 0.70.

The item to total correlations of all items ranged between 0.32 and 0.62. Based on this statistical finding, the third hypothesis was accepted.

Hypothesis four (H_4): wholeness, approximation, spontaneity, and personalization are factors of intuition.

The strongest four factors extracted corresponded to the four subscales (approximation, wholeness, spontaneity, and personalization). Each factor contained four or more items each, and each item had a loading of 0.50 or greater. Based on the findings of the principal components factor analysis, hypothesis four was accepted.

Summary of Findings

A methodological design was used to examine the reliability and validity of HINTS, an instrument developed by the investigator to measure intuition. The findings indicated both reliability and validity of HINTS are adequate for a newly developed instrument.

The final revised version of HINTS (N=24) with alpha of 0.8870 is greater than the minimum value of 0.70 specified in the first hypothesis. The alpha of 0.8870 for HINTS is considered adequate since reliability for most fully developed instruments is between 0.80 and 0.90. The reliability coefficients for the four subscales ranged between 0.7251 for the personalization subscale to 0.7406 for the spontaneity subscale. This again reflects adequate reliability and is greater than the minimum value of 0.60 specified in the second hypothesis. Item to total

correlation of all items were between 0.32 and 0.62. These figures are greater than the minimum value of 0.30 and less than the maximum value of 0.70 specified in the third hypothesis.

Construct validity of the HINTS was evaluated using principal component exploratory factor analysis. Initial evidence of construct validity of the HINTS was obtained. The final version of HINTS (N=24) is included in Appendix G. Discussion of findings as they relate to other research, implications for nursing, and recommendations for future studies are included in Chapter Five.

CHAPTER V

SUMMARY OF THE STUDY

This chapter includes a summary of the research study, discussion of findings, conclusions, implications, and recommendations for further study. In the discussion of findings, the validity and reliability of HINTS, a newly developed instrument to measure intuition in nurses, are addressed. Findings as they relate to the four proposed hypotheses and other research studies are also included.

Synopsis

Intuition is currently being measured as a subscale of lengthy, costly, and complicated personality assessment instruments. In addition, the current scales have psychometric limitations. Current measures of intuition lack clinical utility and empirical support. Inadequate identification of factors associated with intuition prohibits the advancement of knowledge, understanding, and the acceptance of the intuitive process in nursing clinical judgment. Therefore, the problem of the present study was to determine the reliability and validity of the Himaya Intuition Semantic Scale (HINTS), and to validate the components of intuition.

Theoretical support was identified using Gestalt Theory, Cognitive Dissonance Theory, and Ornstein's Modes of Consciousness Theory. Stinchcombe's format was used to structure the merger of these three theories. Psychometric Theory provided a norm-referenced framework and structure for developing the HINTS. The components of intuition (wholeness, approximation, spontaneity, and personalization) were identified by an extensive review of the literature and concept analysis, using the method of Walker and Avant (1983).

The participants in the sample were all adults and the instrument contained no sensitive items. Return of the completed instrument was considered consent to participate in the study. Anonymity and confidentiality were assured to the participants and maintained by the use of a code number for each subject. The study was exempt from Human Subjects Review Committee and posed no threats to the subjects.

The sample consisted of 450 nurses listed in the 1990 directory of all licensed registered nurses in a southern state. Nine-hundred (900) instruments were mailed, and 468 (52%) of these were returned. Eighteen of these instruments were incomplete or not valid and were discarded. The data were collected over a period of three

months. The majority of the subjects were caucasian, married, females, and reside with spouses and children. The average family income was over $60,000 per year. Full-time employment in hospitals and an average of over 13 years of clinical practice describe the characteristics of the participants' clinical experiences.

The instrument used in this study was the Himaya Intuition Semantic Scale (HINTS). The original version of the instrument consisted of sixty items. The initial revised version consisted of 44 items. The four dimensions of HINTS are (1) wholeness, (2) approximation or subjective certainty, (3) spontaneity, and (4) personalization.

The initial version of HINTS (N=60) was evaluated by a panel of experts who published extensively on intuition. Nine authors/experts served as members of the panel of experts. HINTS (N=44) was revised as a result of the quantification efforts of the data and input received by the panel of experts. Experts identified no additional dimensions to those four proposed by the investigator. The content validity index (CVI), a most widely used quantification index of content validity, was used in the development of HINTS. The CVI for items in the revised version of HINTS was 0.73. The CVI for the four subscales

ranged from 0.86 to 1.00. In conjunction with the judgment of the panel of experts and the high magnitude of the CVI, the content validity of the HINTS was supported.

A pilot study was conducted. Data analyses were made based on a random sample of 60 nurses. The revised HINTS (N=44) was used in the pilot study. The reliability of the revised HINTS was estimated in the pilot study using Cronbach's alpha correlation coefficient. The reliability coefficient of HINTS was 0.8789. The reliability coefficients for the subscales in HINTS were 0.7544 (wholeness), 0.6896 (approximation), 0.6641 (spontaneity) and 0.5766 (personalization). Nunnally (1978) recommends a minimum alpha of 0.70 for a new instrument and an alpha of 0.60 for subscales of a new instrument. Based on the small size of the sample (N=60) in the pilot study the alpha for the total instrument and three subscales was acceptable. In addition, the results of the pilot study gave evidence that the instrument was promising as a potentially reliable and useful measure of intuition.

Data from the HINTS were coded and analyzed using the SPSS-X statistical package. The program RELIABILITY was used to obtain the alpha correlation coefficients for HINTS and each of its four subscales. Hypotheses one and two were tested using Cronbach's alpha correlation

coefficients. Hypothesis three was tested using the item/total correlations obtained in the RELIABILITY program of SPSS-X. HINTS was revised as a result of the internal consistency findings. Hypothesis four, to estimate construct validity of HINTS, was tested using exploratory factor analysis.

Discussion of Findings

The Cronbach's alpha correlation coefficient of HINTS was 0.8870. The final alpha coefficients of the subscales were 0.7295 for wholeness, 0.7263 for approximation, 0.7406 for spontaneity, and 0.7251 for personalization. The overall internal consistency reliability coefficients were considered very adequate for a newly developed instrument. As alpha is a measure of internal consistency of an instrument, the higher the alpha coefficient, the higher the consistency of the instrument. In addition, if the instrument has a high alpha, the performance on any one item or subscale is an indicator of the performance on any other item or subscale (Waltz, Strickland, & Lentz 1984).

Three hypotheses related to reliability and one hypothesis related to construct validity are discussed in the following section.

H_1: The internal consistency reliability coefficient of the HINTS is equal to or greater than 0.70. This hypothesis was accepted, as the internal consistency reliability coefficient of HINTS was 0.8870.

H_2: The internal consistency reliability coefficient of each of the four subscales of HINTS (wholeness, approximation, spontaneity, and personalization) are equal to or greater than 0.60. This hypothesis was accepted, as the internal consistency reliability coefficients of the subscales ranged from 0.7251 for the personalization subscale to 0.7406 for the spontaneity subscale.

H_3: Item to total correlations of all items are between 0.30 and 0.70. This hypothesis was accepted, as the item to total correlations of all items on the revised HINTS ranged between 0.32 and 0.62.

H_4: Wholeness, approximation, spontaneity, and personalization are factors of intuition. This hypothesis was accepted. The four subscales (wholeness, approximation, spontaneity, and personalization) correspond to the strongest

four extracted factors. Therefore, the construct validity of HINTS was supported.

Gorsuch (1983) proposed that if the hypothesis is tenable, the extracted factors will represent the conceptual model and will reflect the concepts found in the model. Wholeness, approximation, spontaneity, and personalization were identified as the four components of HINTS.

With the exception of items on factor five, all items clustered on factors by subscale. Interaction between the subscales possibly contributed to the presence of the fifth factor. The first four factors are the strongest; each accounted for over 5% of the explained variance. The fifth factor accounted for only 4.2% of the variance. If one chooses a minimum of 5% of the explained variance as a cut-off to identify a substantive factor, we would have a perfect fit or correspondence between the subscales and factors. This case represents Thurstone's (1947) ideal simple structure where each item loads on only one factor. Future studies related to the strength/adequacy of this fifth factor are recommended.

The extraction of the wholeness, approximation, and spontaneity as factors of intuition supports Rew's (1986) definition of intuition which included three components.

Rew (1986) defined intuition as,

> Knowledge that was received in an immediate way, perceived as a whole, and not arrived at through a conscious linear analytic process (p.23).

In addition, the extraction of wholeness and spontaneity as factors supports two dimensions of Loye's (1983) types of intuition. Loye (1983) described three types of intuition: Gestalt intuition (where hidden cues and patterns are perceived), cognitive inference intuition (sudden or spontaneous awareness), and precognitive intuition (gaining information directly about the future rather than by inference based on knowledge of the past or present). Regarding precognitive intuition, Benner (1984) reported that nurses experienced intuition as knowledge versus feeling when the nurses had more clinical experience. This would imply that knowledge of the past does, in fact, influence one's knowledge of the future.

Conclusions and Implications

The final version (N=24) of HINTS (Appendix G) is a flexible scale which can be completed in 10 minutes. HINTS generates interest in nurses, as evidenced by the rapid and high rate of voluntary participation in the research study. HINTS, a reliable and valid instrument, shows promise as a measure to help nurses gain information about their preferred modes. Knowing one's preferred mode

and sharing this information with team members could enhance the use of differences and strengths of various team members. The results of identifying type differences are valuable information which can be used to make dramatic differences in how nurses teach, practice, and evaluate nursing care.

The reliability and validity of HINTS as a measure of intuition were estimated through a descriptive methodological study. The alpha reliability coefficient of HINTS was 0.8870. This value is considered very adequate for a newly developed instrument. The recommended minimum value of alpha is between 0.80 and 0.90 for well-established instruments. The value of 0.8870 is greater than the minimum value of 0.70 specified in the first hypothesis of this study. Therefore, the first hypothesis was accepted. The internal consistency reliability coefficients for the subscales ranged from 0.7251 for the personalization subscale to 0.7406 for the spontaneity subscale. These figures are greater than the minimum value of 0.60 specified in the second hypothesis. Therefore, the second hypothesis was accepted. The item to total correlation of all items ranged between 0.32 and 0.62. Therefore, the third hypothesis was accepted.

The construct validity of HINTS was evaluated using exploratory factor analysis. The four strongest factors extracted corresponded to the four dimensions (approximation, wholeness, spontaneity, and personalization) hypothesized in the present study. Additional studies with different samples are needed to confirm the construct validity of the HINTS.

Findings of this study reflect themes consistent with three attributes of intuition found in the nursing literature. For example, three subscales of HINTS (wholeness, approximation, and spontaneity) support the three dimensions identified by Rew (1986). In addition, two subscales of HINTS (wholeness and spontaneity) support two of the three types of intuition identified by Loye (1983). This consistency increases the body of knowledge and understanding and provides an impetus to the study of intuition, a hallmark in nursing.

Nurses need to recognize intuition as a component of making decisions in clinical practice. The strength of the nurses' intuition often urges them to do something more for the patient. The present study supports the accumulating evidence that intuition is a valuable component of decision-making in nursing. Further study must be done to understand more fully how nurses

synthesize objective and subjective data in order to arrive at their decisions. Nurses need the support of their colleagues and that of physicians in recognizing the importance of intuition in clinical decision-making. It is imperative that educators recognize and teach concepts related to intuition in making clinical judgments. In summary, recognition of intuitive experiences has consequences for communication and decision-making in clinical practice.

The ultimate message of science is that it is tentative, incomplete, and uncertain. Analytical thinking alone cannot deal with current problems. A creative, intuitive, non-linear approach could lead to increased understanding of reality when rigorous, controlled methodology does not. Objectivity has not proven to be an answer to our ability to describe, explain, predict, and control. Therefore, we need to consider the role of subjectivity. By developing knowers whose subjective skills are encouraged and cultivated, we harness a vital resource of humankind (Goldberg, 1983).

Recommendations for Future Research

Findings of this study suggest several areas for future research. The following recommendations for further study are important steps in continuing instrument

credentialing and testing:

(1) Additional studies with different samples are needed to confirm the construct validity of HINTS. These studies might confirm the proposed four dimensional model and clarify the additional factor related to the interaction among dimensions.

(2) Use LISREL in confirmatory factor analysis to test the four dimensional model.

(3) The validity of HINTS should be tested by a multitrait-multimethod design. A random sampling technique would help to strengthen confidence in the validity and reliability of HINTS.

(4) Secondary analysis of the data from the present study would provide important information on the relationship between the various aspects of the group and the scores on the HINTS.

(5) Perform a regression analysis procedure on HINTS and subject characteristics to determine the predictor variables for intuitive nurses.

Summary

The findings of this study reflected adequate reliability and validity of HINTS. Factor analysis supported the four component model and construct validity of HINTS. HINTS shows promise as a reliable, valid

measure of intuition which will help nurses gain information about their preferred modes of decision-making. The promise is critical, not only in the utility of the instrument in research studies, but also in clinical settings where determination of individual differences influences clinical decisions. Findings reflected themes consistent with the attributes of intuition found in the literature. The results warrant further research in the development of HINTS, following the recommendations included in this study.

A valid and reliable measure of intuition is needed for more than answering the question of who is intuitive. It is a means to understand strengths of various members of the nursing team, a way to maximize the potential of each nurse. Increased knowledge of intuition and its predictor variables will dramatically influence how nurses teach, practice, communicate, and evaluate nursing practice. Intuition fosters creative solutions to increasingly complex problems. Recognition of intuitive experiences has significant consequences for nurses and nursing.

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Appendix A

Prospectus Approval

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON
THE GRADUATE SCHOOL
P.O. Box 22479, Denton, Texas 76204 817/898-3400, 800-338-5255

January 8, 1991

Ms. Jo Ann Himaya
2320 Brownlee Road
Bossier City, LA 71111

Dear Ms. Himaya:

I have received and approved the Prospectus for your research project. Best wishes to you in the research and writing of your project.

Sincerely yours,

Leslie M Thompson

Leslie M. Thompson
Dean for Graduate Studies
and Research

dl

cc Dr. Linda Harrington
Dr. Carolyn Gunning

Appendix B

Consent to Participate in Study

JoAnn HIMAYA, R.N., M.A.N.
2320 Brownlee Road
Bossier City, LA 71111

Tel: (318) 677-3020 (0) (318) 742-6695 (H)

January 9, 1991

Dear Colleague:

I am a doctoral student in the Nursing Program at Texas Woman's University, and an Assistant Professor of Nursing at Northwestern State University, in Shreveport, La. I am studying the concept of intuition, as it is used by nurses. I am requesting your participation in a study to evaluate an instrument to measure intuition.

Your responses for the scale and for the biographical data will be held in strict confidence and at no time will your name be used in this study and/or released to any third party. The instructions for responding to the scale are attached. The data about individuals will be used to compile a profile for the total sample. Your assistance could benefit nurses personally and professionally by providing information that could positively influence nursing and decision-making by nurses.

Thank you very much in advance for your time and energy invested in completing and returning the questionnaire. Please return your biographical data sheet and the intuition scale in the attached self-addressed, stamped envelope not later than January 25, 1991, in order for me to be able to include your results in my report. Please remember that every response counts and I am dependent on your help.

Sincerely,

Jo Ann Himaya M.A.N., R.N.

Appendix C

Himaya's Intuition Semantic Scale (HINTS)

HIMAYA INTUITION SEMANTIC SCALE (HINTS)

Purpose of Scale

There are no right or wrong responses. This scale is not a measure of intelligence. It is not an indicator of emotional problems. It does not show how well you function in comparison with other people. This Inventory is a key to understanding the nature of your own habit patterns (analytical and intuitive), your usual ways of approaching tasks or situations. One way of reacting is no better or worse than any other, but there are differences. Each person tends to respond more frequently in some ways than in others.

Directions

Use these sheets to record your responses. If at all possible try to answer every item and mark an "X" for each item. If you cannot decide on an item, skip it but be careful that the next space you mark on the line matches the question you are then answering. Read each item carefully. There is no time limit to this scale, but it is best not to mull over the item. Indicate how you actually perceive yourself most of the time. Not how you think you should be. We are not interested in what you think you should do or feel, or what the right thing to do may be. We are interested in what you actually do or feel now.

Place an "X" on the line below each set of adjectives that best describes your approach to information and decision-making. Place the "X" close to the corresponding number that you believe relates the strength of your tendency toward the adjective that you relate to.

Please note that each response, or item, has a line with 7 evenly spaced numbers. These numbers relate to the weight of the phrase or adjective as you see it describing you. For example if you base your decisions always on fact, place your "X" on or close to the number zero. However, if you always rely on your hunches, place your "X" on or close to the number 7.

HIMAYA INTUITION SEMANTIC SCALE (HINTS)

Directions: Choose the adjective or phrase most descriptive of your thinking or judging, then on its strength by placing an "X" at the corresponding point on the line.

	Facts							Hunches
1.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Rules/Policies							Ideas/Principles
2.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Sensing							Feeling
3.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Imagination							Logic
4.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Pattern Recognition							Data Recognition
5.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Approximation							Exact
6.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Structure							Unstructured
7.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Reality							Fantasy
8.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Creative							Practical
9.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	All the Data							Relationships
10.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Objective							Subjective
11.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Planned							Unplanned
12.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7

HIMAYA INTUITION SEMANTIC SCALE (HINTS)

Directions: Choose the adjective or phrase most descriptive of your thinking or judging, then on its strength by placing an "X" at the corresponding point on the line.

Explanation — Discovery

13. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Create — Make

14. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Focus on Total Data — Focus on Gaps or Missing Data

15. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Comprehensive Data — Minimal Data

16. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Systematic — Spontaneous

17. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Build — Invent

18. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Design — Production

19. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Clear Relationships — Hidden Relationships

20. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Facts — Ideas/Principles

21. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Flexible — Inflexible

22. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Distribution — Research

23. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

Meditative — Solution Oriented

24. /——/——/——/——/——/——/——/
0 1 2 3 4 5 6 7

HIMAYA INTUITION SEMANTIC SCALE (HINTS)

Directions: Choose the adjective or phrase most descriptive of your thinking or judging, then on its strength by placing an "X" at the corresponding point on the line.

Literal — Figurative

25. 0 1 2 3 4 5 6 7

Precise — Ambiguous

26. 0 1 2 3 4 5 6 7

Procedures — Guidelines

27. 0 1 2 3 4 5 6 7

In a Rut — Head in Cloud

28. 0 1 2 3 4 5 6 7

Face Value — Insightful

29. 0 1 2 3 4 5 6 7

Whole/Global — Check-List

30. 0 1 2 3 4 5 6 7

Integration of Data — Identification of Data

31. 0 1 2 3 4 5 6 7

Impulsive — Pre-Calculated

32. 0 1 2 3 4 5 6 7

Public Knowledge — Personal Knowledge

33. 0 1 2 3 4 5 6 7

Prediction — Expectation

34. 0 1 2 3 4 5 6 7

Recite — Experiential

35. 0 1 2 3 4 5 6 7

HIMAYA INTUITION SEMANTIC SCALE (HINTS)

Directions: Choose the adjective or phrase most descriptive of your thinking or judging, then on its strength by placing an "X" at the corresponding point on the line.

Analytical — Abstract

36. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Analysis — Synthesis

37. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Routine — Brainstorm

38. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Common Sense — Deductive/Logic

39. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Deterministic — Anticipation

40. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Verbal — Pre-Verbal

41. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Possibilities — Givens

42. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Uncertainty — Certainty

43. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Known — Unknown

44. /———/———/———/———/———/———/———/
0 1 2 3 4 5 6 7

Appendix D

Biographic and Demographic Data Form for HINTS

BIOGRAPHIC AND DEMOGRAPHIC DATA FORM FOR HINTS

This form elicits minimal factual data needed for this research study. The data will be coded and analyzed by computer. The names will not be used in reporting results. The information sought in this form will be kept confidential and will be used only in the preparation of a general profile for individuals participating in this research study.

Date:_____ Code #:_____

Q-1 Your sex. (Circle number of your answer)

1 Male
2 Female

Q-2 Your race. (Circle number of your answer)

1 WHITE
2 BLACK
3 HISPANIC/SPANISH
4 ASIAN OR PACIFIC ISLANDER
5 AMERICAN INDIAN/ ALASKAN NATIVE

Q-3 Your present marital status is: (Circle number)

1 NEVER MARRIED
2 MARRIED
3 DIVORCED
4 SEPARATED
5 WIDOWED
6 OTHER (SPECIFY) _____

Q-4 Your present age : _____ YEARS

Q-5 Number of children you have : _____ CHILDREN

Q-6 Do you presently live (circle one number)

1 ALONE
2 WITH SPOUSE
3 WITH SPOUSE AND CHILDREN
4 WITH PARENTS
5 WITH OTHER RELATIVES
6 WITH CHILDREN
7 WITH FRIEND(s)

Q-7 Your approximate total gross income for the year from all sources for:

$_____ YOURSELF
$_____ SPOUSE

Q-8 Which is the highest level of education that you have completed (Circle number of your answer)

1 DIPLOMA IN NURSING
2 ASSOCIATE DEGREE IN NURSING
3 BACCALAUREATE DEGREE IN NURSING
4 BACCALAUREATE DEGREE IN OTHER AREA
5 MASTERS DEGREE IN NURSING
6 MASTERS DEGREE IN OTHER AREA
7 DOCTORATE DEGREE IN NURSING
8 DOCTORATE DEGREE IN OTHER AREA

Q-9 Are you presently : (Circle number)

1 EMPLOYED FULL-TIME (40 HRS. OR MORE)
2 UNEMPLOYED
3 EMPLOYED PART-TIME
4 RETIRED

Q-10 The current location of your employment (Circle number)

1 HOSPITAL
2 SPECIAL CARE UNIT
3 COMMUNITY HEALTH CENTER
4 PRIVATE PRACTICE
5 EXTENDED CARE UNITS
6 OTHERS (PLEASE SPECIFY) _____

Q-11 Number of years in Clinical Practice: _____

Q-12 Your current level of practice in nursing (circle number)

1 STAFF NURSE
2 HEAD NURSE
3 SUPERVISOR
4 PRIVATE PRACTICE
5 CLINICAL SPECIALIST
6 OTHERS (PLEASE SPECIFY) _____

Q-13 Your area of Current Clinical Practice (circle number)

1 PSYCHIATRIC NURSING
2 MEDICAL-SURGICAL NURSING
3 MATERNAL-CHILD HEALTH
4 COMMUNITY HEALTH
5 PEDIATRICS
6 INTENSIVE CARE
7 GERONTOLOGY
8 OTHERS (PLEASE SPECIFY) _____

Q-14 Your frequency of patient contact (circle number)

1 MOST OF TIME
2 SOMETIME
3 RARELY
4 NEVER

Appendix E

Experts Endorsement of HINTS by Item in the Revised Version (N=60) to Establish Content Validity Beyond the .05 Level of Significance

Experts Endorsed HINTS Subscale by Item in the Revised Scale to Establish Content and Construct Validity Beyond the .05 Level of Significance

Revised Version #	Original Version #	# of Experts Responded	Experts Endorsed Item As Content Valid #	Experts Endorsed Item As Content Valid %
I. WHOLENESS				
5	20	9	9	100
10	21	9	7	78
15	23	9	7	78
20	24	9	9	100
25	34	9	9	100
30	35	9	8	89
35	50	9	7	78
37	51	9	8	89
40	44	9	7	78
44	14	9	7	78
Subtotal 10	10	9	7-9	78-100
II. APPROXIMATION				
1	1	9	9	100
6	2	8	7	89
11	5	9	7	78
16	22	9	7	78
21	37	9	7	78
26	56	9	7	78
31	25	9	7	78
36	10	8	6	75
42	54	8	6	75
43	3	9	7	78
Subtotal 10	10	8-9	6-9	75-100

(appendix continues)

Revised Version #	Original Version #	# of Experts Responded	Experts Endorsed Item As Content Valid #	%
III. SPONTANEITY				
2	27	7	6	86
8	12	9	7	78
70	28	9	7	78
12	29	8	6	75
17	53	8	8	100
22	55	8	6	75
27	30	7	6	86
28	32	9	7	78
32	41	9	7	78
Subtotal 9	9	7-9	6-8	75-100
IV. PERSONALIZATION				
3	6	9	7	78
4	11	9	8	89
9	13	9	7	78
13	15	9	7	78
14	16	9	7	78
18	17	9	7	78
19	18	8	7	89
23	19	9	7	78
24	26	8	6	75
29	39	9	7	78
33	42	9	7	78
34	43	9	78	78
38	48	9	7	78
39	49	8	6	75
41	33	8	6	75
Subtotal 15	15	8-9	6-9	75-100
Grand Total 44	60	6-9	6-9	75-100

Appendix F

Summary of Experts Endorsement of HINTS (Revised, N=44) by Dimension to Establish Content Validity Beyond the .05 Level of Significance

Summary of Experts Endorsement of HINTS (Revised) by Dimension to Establish Content Validity Beyond the .05 Level of Significance

I. Dimension #1 (Wholeness)

a. Items # (n=10) 5,10,15,20,25,30,35,37,40,44
b. # of Experts Responded: 9 out of 9
c. % of Experts Endorsed Items as Content Valid 78% - 100%
d. Proportions of experts whose endorsement is required to establish content validity beyond the .05 level of significance = .88 - 1.00

II. Dimension #2 (Approximation)

a. Items # (n=10) 1,6,11,16,21,26,31,36,42,43
b. # of Experts Responded: 8 out of 9
c. % of Experts Endorsed Items as Content Valid 75% - 100%
d. Proportions of experts whose endorsement is required to establish content validity beyond the .05 level of significance = .86 - 1.00

III. Dimension #3 (Spontaneity)

a. Items # (n=9) 2,7,8,12,17,22,27,28,32
b. # of Experts Responded: 7 out of 9
c. % of Experts Endorsed Items as Content Valid 75% - 100%
d. Proportions of experts whose endorsement is required to establish content validity beyond the .05 level of significance = .86 - 1.00

IV. Dimension #4 (Personalization)

a. Items # (n=15) 3,4,9,13,14,18,19,23,24,29,33,34,38,39,41
b. # of Experts Responded: 8 out of 9
c. % of Experts Endorsed Items as Content Valid 75% - 89%
d. Proportions of experts whose endorsement is required to establish content validity beyond the .05 level of significance = .86 - .89

Appendix G

Himaya Intuition Semantic Scale (HINTS)
Final Version (N=24)

Himaya Intuition Semantic Scale (HINTS) by Subscale - Final Version (N=24)

The final version of HINTS consists of 24 items distributed among the four dimensions as follows:

Wholeness (n=7): Items 6, 10, 15, 17, 20, 22, 24

Approximation (n=5): Items 1, 11, 16, 18, 21

Spontaneity (n=6): Items 2, 3, 4, 7, 12, 19

Personalization (n=6): Items 5, 8, 9, 13, 14, 23

Four Items (5, 9, 14, 21) are reversed and should be recoded for scoring purposes. The final version of HINTS is presented on the following pages.

Himaya Intuition Semantic Scale (HINTS)
Final Version (N=24)

Directions: Choose the adjective or phrase most descriptive of your thinking or judging, then on its strength by placing an "X" at the corresponding point on the line.

	Facts							Hunches
1.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Rules/Policies						Ideas/Principles	
2.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Structure							Unstructured
3.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Reality							Fantasy
4.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Creative							Practical
5.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	All the Data							Relationships
6.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Planned							Unplanned
7.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Explanation							Discovery
8.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Create							Make
9.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Focus on Total Data					Focus on Gaps or Missing Data		
10.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Comprehensive Data							Minimal Data
11.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7
	Systematic							Spontaneous
12.	/	/	/	/	/	/	/	/
	0	1	2	3	4	5	6	7

Himaya Intuition Semantic Scale (HINTS)
Final Version (N=24)

Directions: Choose the adjective or phrase most descriptive of your thinking or judging, then on its strength by placing an "X" at the corresponding point on the line.

13. Build — Invent
0 1 2 3 4 5 6 7

14. Design — Production
0 1 2 3 4 5 6 7

15. Clear Relationships — Hidden Relationships
0 1 2 3 4 5 6 7

16. Facts — Ideas/Principles
0 1 2 3 4 5 6 7

17. Literal — Figurative
0 1 2 3 4 5 6 7

18. Precise — Ambiguous
0 1 2 3 4 5 6 7

19. Procedures — Guidelines
0 1 2 3 4 5 6 7

20. Recite — Experiential
0 1 2 3 4 5 6 7

21. Analytical — Abstract
0 1 2 3 4 5 6 7

22. Analysis — Synthesis
0 1 2 3 4 5 6 7

23. Routine — Brainstorm
0 1 2 3 4 5 6 7

24. Known — Unknown
0 1 2 3 4 5 6 7