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# The Development and Psychometric Testing of an Instrument Measuring the Use of Intuition by Nursing Students

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# THE DEVELOPMENT AND PSYCHOMETRIC TESTING OF AN INSTRUMENT MEASURING THE USE OF INTUITION BY NURSING STUDENTS

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## Abstract

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Measurement of intuition use among nursing students has not occurred because developed intuition measures have been designed specifically for experienced nurses. The purpose of this study was to develop and psychometrically evaluate an intuition instrument for nursing students. An intuition instrument can provide the means to (a) determine if students use intuition in care providing activities and (b) measure intuition use over time.

Instrument development included (a) concept clarification, (b) item development, and (c) psychometric testing. Intuition was defined as a nonlinear process of knowing perceived through physical awareness, emotional awareness, and/or through physical or spiritual connections. Content experts established item content validity for the dimensions of emotional awareness, physical awareness, and making connections. The resulting 33-item instrument was pretested in a sample of senior nursing students.

A random sample of 1,000 senior BSN and AD nursing students was selected from the National Student Nurse Association membership. Data

collection through the mail resulted in 349 responses (35% response rate). Principal component analysis with orthogonal varimax rotation resulted in 7 factors accounting for 66.2% of the variance: Factor 1, physical sensations (26.6%); Factor 2, premonitions (9.2%); Factor 3, spiritual connections (6.5%); Factor 4, reading of cues (5%); Factor 5, sensing energy (4.6%); Factor 6, apprehension (3.6%); and Factor 7, reassuring feelings (3.4%). Eigenvalues ranged from 1.010 to 4.107 and factor loadings ranged from .53 to .85. Cronbach's alpha for each factor ranged from .69 to .84 and was .89 for the revised 25-item instrument. The seven factors that emerged supported the concept definition of intuition and the use of intuition by students. Future research needs to focus on further development and psychometric testing of the revised instrument.

# DEDICATION

This is dedicated to my loving parents, **Joel and Terri Smith**, who always provided the moral, financial, and spiritual support to make anything possible.

My **father** was always there to listen and provide words of wisdom at any hour of the day. His belief in my success was unconditional. His prayers were always felt.

My **mother** guided me from above. Her prayers and presence were always felt.

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# CHAPTER 1

# INTRODUCTION

Intuition is a nonlinear process of knowing that is perceived through physical and emotional awareness and/or through physical or spiritual connections. Intuition has been described as an important type of nursing knowledge (Paterson & Zderad, 1988) and has gained acceptance as a valid way of knowing in clinical nursing (Benner & Tanner, 1987; Rew, 1986, 1988a, 1988b; Schraeder & Fischer, 1987). The use of intuition by experienced nurses has been explored in the nursing literature (Agan, 1987; Benner & Tanner, 1987; Leners, 1992; Pyles & Stern, 1983; Rew, 1988a, 1988b; Schraeder & Fischer, 1987; Young, 1987) and it has become one way of explaining professional expertise (Benner, 1984; Easen & Wilcockson, 1996).

The value of intuition is not unanimously supported in the nursing literature (Rew & Barrow, 1987; Lammond & Thompson, 2000; McCain, 1965), although in some scholarly circles intuition is considered part of the nursing process (McMurray, 1989; Miller & Rew, 1989; Rew, 1988a, 1988b; Young, 1987). The value of the nursing process, which is a linear model of knowledge acquisition, has contributed to the shunning of intuition. Historically, intuition was devalued in the nursing literature. McCain (1965) published an article in *The*

*American Journal of Nursing* entitled, "Nursing by Assessment- Not Intuition". This article advocated competent analytical thinking and stated that nursing care should not be based on intuition. The value of intuitive abilities was dismissed and the call for orderly and linear thinking was promoted. Rew and Barrow (1987) analyzed the published literature in the *American Journal of Nursing* from 1900-1987 and determined that intuition as an essential component of complex decision-making was neglected and devalued in the published literature. In the nursing literature, intuition was contrasted with analysis and linear decision-making, yet identified as an essential component of complex decision- making (McCain, 1965; Rew & Barrow, 1987).

Thirty-five years later Lammond and Thompson (2000) reiterated the value of analytical thinking advocating the use of analysis over the use of intuition when making patient care decisions. These authors did not explore the possibility of intuitive judgments being accurate, or the research that has demonstrated positive outcomes when intuition is utilized in decision-making (Rew, 1988a, 1988b). Another factor that hinders the acceptance and fostering of intuitive abilities in the nursing profession is the reticence that both experienced nurses and nursing students feel about using intuition. Experienced nurses have denied their use of intuition because it was considered "black-market" knowledge (Benner & Tanner, 1987) or "risky" (Leners, 1992). Nursing students doubted the existence of intuition because they considered it "cutting corners" (McCormick, 1993) or "magical thinking" (Rosanoff, 1999).

Sole reliance on analysis contradicts the findings of the research on intuition. Nursing research has demonstrated that intuition is a valid form of knowing (Benner & Tanner, 1987; Rew, 1988b) that plays an influential role in the nursing process, a linear and logical process and contributes to positive patient outcomes (McCutcheon & Pincombe, 2001; Rew, 1988a, 1988b; 1990; Young, 1987).

## Statement of the Problem

With the association between experience and intuition, nursing students have been overlooked in the studies that examined intuition use in nursing practice. Research on intuition has focused primarily on the experienced practitioner. The qualitative studies that explored the concept of intuition used samples of experienced nurses with at least one year of clinical experience in critical care settings (Pyles & Stern, 1983; Schraeder & Fischer, 1987; Rew, 1990), in psychiatric settings (Rew, 1988a, 1988b), in hospital settings (Leners, 1992) and in home health settings (Rew, 1988a, 1988b). Characteristics of intuitive nurses (Miller, 1993), personal factors that influence intuitive thinking (Schraeder & Fischer, 1987), and personal dimensions that facilitate intuition (Young, 1987) have been identified in the experienced nurse.

Few studies have examined intuition use among nursing students (McCormick, 1993; Sublett, 1997). McCormick (1993) explored the role of intuition in decision-making among nursing students and the emphasis of the findings was on the need to incorporate intuition into nursing curricula. Sublett (1997) examined the relationship between cognitive development and intuitive

judgment in senior nursing students and concluded that students do possess intuitive judgment to some degree. Both studies stressed the need to consider intuition use among nursing students.

Valid and reliable instruments that measure the intuitiveness of experienced nurses (Miller, 1993), the use of intuition in decision making (Himaya, 1991), and the acknowledgement of using intuition in clinical decision making (Rew, 2000) have been developed for use by the practicing nurse. These developed intuition instruments were designed specifically for the experienced nurse and have not been tested in samples of nursing students (Himaya, 1991; Miller, 1993; Rew, 2000). Presently, there is no intuition instrument that measures the use of intuition by nursing students.

## Purpose Statement

The purpose of this study is to develop and psychometrically evaluate an instrument that will measure the use of intuition by nursing students in their care providing activities. Specifically, this study aims to (a) identify dimensions for the indicators of intuition use among nursing students, (b) generate items for the measure, and (c) establish the measure's construct validity and reliability.

## Philosophical Influences

Ontological and epistemological philosophies have influenced the methodologies used to explore and measure intuition use among nurses. When epistemological questions, questions about nursing knowledge, were answered in an empirical manner, intuition was shunned because it was not viewed as empirical in nature. The value of the positivist paradigm contributed to the

promotion of analytical skills at the expense of intuitive skills (Lammond & Thompson, 2000; McCain, 1965) and the value of empiricism by practicing nurses resulted in the hesitation to accept intuition as a valid way of knowing (Benner & Tanner, 1987; Leners, 1992).

The philosophical movement from the positivistic paradigm to a post-positivistic paradigm was instrumental in the continued investigation of intuition and the acceptance of intuition in the nursing literature. The post-positivist viewpoint supports the notion of a dynamic reality or multiple realities (Streubert-Speziale & Carpenter, 2003) and qualitative research methodologies permitted the investigation of multiple realities. Intuition was explored through phenomenology and other qualitative methods, which resulted in multiple perspectives and meanings of intuition. Intuition was defined in the nursing studies as a phenomenological knowing (Sarvimaki & Stenbock-Hult, 1996; Schraeder & Fischer, 1987; Young, 1987) and as a clinical knowing (Benner, 1984; Benner & Tanner, 1987; Sarvimaki & Stenbock-Hult, 1996).

Qualitative methodologies and inductive data introduced new meanings and dimensions of intuition. An empirical or positivistic methodology can be pursued based on the qualitative and inductive findings. The strength of this instrument development study is that it is grounded in qualitative data. Dimensions of intuition identified from a multi-disciplinary review of the literature are the building blocks for the conceptual framework that guide the development of the new instrument and contribute to theory development.

## Significance to Nursing

As a source of knowledge, intuition complements the nursing process and makes nursing care more holistic (Beck, 1998; McCormick, 1993; McMurray, 1989). The nursing literature has discussed the need to include the concept of intuition in nursing curricula and the need to promote and foster intuitive abilities among nursing students (Beck, 1998; Correnti, 1992; Ham, 2000; Ruth-Sahd, 1993). Evaluation of intuitive abilities has also been encouraged in the academic arena, because intuition and analysis have a synergistic relationship (Bloomquist, 1985).

A valid and reliable scale that demonstrates the use of intuition by nursing students can advance nursing knowledge. The intuition instrument can provide the means to (a) determine if nursing students use intuition in their care providing activities and (b) measure intuition use over time. Findings from this instrumentation can also provide the impetus for nursing curricula to (a) acknowledge the use of intuition by nursing students, (b) consider the role of intuition in the nursing process, (c) develop strategies to foster and evaluate intuitive abilities, and (d) consider the possibility of addressing the nursing process and intuition in a unified approach.

## Summary

Intuition is a nonlinear process of knowing that is perceived through physical and emotional awareness and/or through physical or spiritual connections. Nursing research has focused on intuition use in expert decision-making (Rew, 1988a, 1988b) and the nursing literature has labeled it as a source of knowledge (Benner & Tanner, 1987; Rew, 1986; Schrader & Fischer, 1987). A

post positivistic philosophy contributed to the exploration of intuition in nursing practice. Findings from qualitative methodologies permit the identification of intuition dimensions, the development of a conceptual framework, and the measurement of intuition.

Presently there are no instruments that measure the use of intuition by the nursing student and available intuition instruments have not been tested in samples of nursing students. The development of an intuition instrument for nursing students will provide the means to (a) determine if students use intuition in their care providing activities and (b) measure the use of intuition over time.

# CHAPTER 2

## REVIEW OF THE LITERATURE

The primary purpose of this review is to explore what is known about intuition in the literature. The literature from 1965-2002 was reviewed, including theoretical papers, qualitative studies, and quantitative studies from the disciplines of nursing, business, education, medicine, and psychology. Computer databases used in this review included CINHAL, ERIC, and MEDLINE. The words "intuition" and "intuition and nursing students" were used to conduct the computer searches.

The literature included in this review (a) defined the concept of intuition and identified dimensions of intuition, (b) explored the use of intuition among professionals and/or students, and (c) measured the use of intuition among professionals and/or students. Literature not meeting these criteria was excluded. Forty-five theoretical articles and thirty-four research studies were reviewed. This review will (a) define the concept of intuition, (b) identify measurable dimensions of intuition, (c) discuss the antecedent variables that influence intuition use, (d) identify and describe the available intuition instruments, and (e) critique existing research and identify gaps in the intuition knowledge.

*Definition and Dimensions of Intuition*

In the multi-disciplinary review of the theoretical and empirical literature, intuition is described as (a) a knowing (Carper, 1978; Paterson & Zderad, 1988), (b) a component of decision making (Agor, 1989; Brockmann & Simmonds, 1997; Cioffi, 1997; Khatri & Ng, 2000; Orme & Maggs, 1993; Page, 1978; Rew, 1988b, 2000), (c) a physical or spiritual connection (Agan, 1987; Davis-Floyd & Davis, 1996; Leners, 1992; Pyles & Stern, 1982; Rew, 1989; Schraeder & Fischer, 1987; Vaughan, 1979), (d) a nonlinear process (Ajzen, 1977; Baylor, 1997; Bolen, 1979; King & Appleton, 1997; Kleinmuntz, 1990), and (e) difficult to verbalize (Baylor, 1997; Goldberg, 1983; Kenny, 1994; Nodding & Shore, 1984; Rowan, 1989). For the purpose of this tool development and based on the review of literature, intuition is defined as a nonlinear process of knowing that is perceived through physical and emotional awareness and/or through physical or spiritual connections.

The dimensions of intuition identified in the multidisciplinary literature stem from theoretical discussions, empirical findings, and from the developed definition of intuition. The dimensions of intuition are (a) emotional awareness, (b) physical awareness, and (c) the making of connections at the physical or spiritual level.

*The Dimension of Emotion Awareness*

Emotional awareness is the knowing that comes through emotional feelings and empathy. Feelings are intuition at the emotional level (Vaughan,

1979). Information is encoded in emotional sets and retrieved through feeling cues, thus feelings become a source of knowledge (Bastick, 1982).

Intuitive feelings are also associated with empathy. Empathy is the process of understanding others, how they feel, and their subjective experiences (Farry, 1985; Philipp, Philipp, & Thorne, 1999). Empathy and the feelings associated with empathy are defined as a source of intuitive knowledge in the theoretical writings, primarily from the medical and psychological literature (Bastick, 1982; Farry, 1985; Philipp, Philipp, & Thorne, 1999; Vaughan, 1979). Philipp, Philipp, and Thorne (1999) linked empathy to knowing and intuition. "Intuition is an essential ingredient, which enables us to gain knowledge without direct evidence in an empathetic encounter" (Philipp, Philipp & Thorne, 1999, p. 40). Lichenberg (1993) defined intuition as a cognitive-affective capacity, which allows an empathetic mode of perception. Thus a knowing comes from emotional and empathetic involvement.

*Empirical Literature.* Qualitative studies from the discipline of nursing illustrated the use of emotional awareness when caring for patients intuitively. The qualitative methods included grounded theory (Young, 1987), content analysis (Rew, 1988a, 1988b, 1990), ethnography (Ling & Luker, 2000), Socratic dialogues (Hansten, 2000), and a constructivist approach (King & Clark, 2002). Emotional awareness included both positive and negative feelings, which were associated with patient assessment and patient care. Table 2.1 lists the nursing research that identifies emotional awareness associated with intuition use.

Table 2.1

*Nursing Research That Identifies Emotional Awareness Associated with Intuition*

| Reference | Methodology | Sample | Findings/Emotional Awareness |
|---|---|---|---|
| Young, 1987 | Grounded theory | Convenience sample; 41 females (all but 2 were RNs) Experience level not described | Feeling cues used to identify intuitive experiences |
| Rew 1988a | Content analysais | Convenience sample; 56 nurses (5 male and 51 females) Average years of clinical experience was 12.7 | Strange, fearful, nagging feelings. |
| Rew, 1988b | Content Analysis | Convenience sample; 26 home health nurses; 25 female/ 1 male; clinical experience ranged from 4-42 years | Intense feelings, apprehension, excitement, and feeling calm. Global and specific feelings |
| Rew, 1990 | Content analysis | Convenience sample; 25 RNs from critical care settings (only 4 males) Average years of experience 7.96 | Feelings related to experience, patient and nurse. |
| Ling & Luker, 2000 | Ethnography | Convenience sample;16 health visitors engaged in child protection | Feelings of something wrong or sense of unease |
| Hansten, 2000 | Socratic Dialogue | Staff nurses and nurse executives; Experience level, sample selection, size, or area of expertise was not identified | Feelings of things being right or working out. (Positively based feelings) |
| King & Clark, 2002 | Observations and interviews with constructivist approach | Purposive sample; 61 qualified nurses who worked on surgical wards. Levels of expertise were of the advanced beginner, competent, proficient, and expert nurse. | Feelings of uneasiness or happiness related to patient. Feelings that there would be problems or feelings that no problems would occur |

Feelings were found to be associated with intuition in one grounded theory approach exploring intuition use in nursing practice (Young, 1987). Feeling cues dominated 79% of the intuitive incidences described by nurses and 44% of the cues were based solely on feelings. Intuition was viewed as a personal knowing grounded in experience.

Rew (1988a, 1988b, 1990) explored the use of intuition in experienced nurses by using an interview schedule in samples of critical care and home health nurses. Intuition emerged as a feeling and a knowing. Feelings associated with intuitive experiences were described and these feelings related to the experience, to the patient, and to the nurses.

The experienced nurses interviewed by Rew (1988a, 1988b) associated emotional feelings with their intuition. Some said that they could not separate their thoughts from their feelings. The nurses described intense feelings, apprehension, excitement, and feeling calm and peaceful. Other terms used to describe feelings included "blank, crazy, strange, uneasy, antsy, and positive" (Rew, 1988b, p. 29). "It's just a natural vibration of feeling that is coming through to you" (Rew, 1988a, p. 151-152). Other comments included, (a) "I felt strange", (b) "basically, just a nagging feeling", and (c) "I was fearful" (Rew, 1988b, p. 152). These various forms of feelings were a source of knowledge for the nurses. Feelings played a vital role in perception and the knowing that came with the perceptions.

Using ethnography to explore 16 health visitors' perceptions of child protection in the context of everyday professional practice, Ling and Luker (2000)

found that concern for a child's safety came from intuitive awareness, a form of knowledge. The feelings were of something being terribly wrong or a sense of unease even when there was no objective data.

In another study, Hansten (2000) used a Socratic dialogue, which required participants to summarize a speaker's ideas, to elicit definitions of intuition from staff nurses and executive nurses. The staff nurses described intuition, as being positively based and associated with feelings that everything will work out. Feelings associated with intuition may not always be negative or have connotations of impending doom. The emotions experienced by nurses and health visitors, whether positive or negative in nature, were a source of knowledge and influenced decisions related to the patient or child (Hansten, 2000; Ling & Luker, 2000).

King and Clark (2002) used a constructivist approach to explore and identify the nursing expertise of 61 registered nurses on a surgical ward based on Benner's (1984) levels of expertise. The clinical experience of the sample reflected that of the advanced beginner nurse, the competent nurse, the proficient nurse, and the expert nurse. No novice nurses were included. Intuition was found to be related to decision making at different levels of expertise. The beginner experienced vague intuitive feelings of uneasiness or happiness about a patient's status but was unwilling to verbalize or report these feelings. As the level of expertise increased, the nurse's response to intuitive feelings was connected to decision-making and analysis. The intuitive feelings related to (a) feelings that

problems would arise in the patient's recovery or (b) feelings that it would be a problem free recovery for the patient.

*Summary*. For the purpose of this tool development, the dimension of emotional awareness is defined as the knowing that comes through emotional feelings and empathy. Emotional feelings are a source of knowledge that have been linked to experience and decision making (King & Clark, 2002; Rew, 1988a, 1988b; Young, 1987), although experience is not necessarily required for the perception of feelings (King & Clark, 2002). Empathy is included in this dimension because it relates to understanding another's feelings.

*The Dimension of Physical Awareness*

Intuition as mind and body awareness was described in the business (Agor, 1989; Contino, 1996), education (Schmidt, 1995), nursing (Pyles & Stern, 1983; Rew, 1988a, 1988b; Schraeder & Fischer, 1987; Young, 1987), and psychology literature (Bastick, 1982; Goldberg, 1983; Vaughan, 1979). Physical awareness is the knowing that comes from within the body and is interpreted through the five sense organs and through physical sensations. Qualitative and quantitative data demonstrated the physicality of intuition and the influential role these physical sensations have on making patient care decisions or business decisions (Agan, 1987; Agor, 1989; Isenberg, 1984; Khatri & Ng, 2000; Rew, 1988a, 1988b; Schraeder & Fischer, 1987; Pyles & Stern, 1983; Young, 1987). The physical sensations described in the literature involved all the senses in the body. It is difficult to share the physical sensations that are experienced with

intuition, but these physical sensations can be objectively verbalized and described.

*Empirical Literature.* The findings from both quantitative and qualitative studies have linked intuition to gut feel (Davis-Floyd & Floyd, 1996; Isenberg, 1984; Kelly, 1994; Khatri & Ng, 2000; McCutcheion & Pincombe, 2001; Pyles & Stern, 1983; Rew, 1988b especially among nurses and businessmen (Agor, 1989; Contino, 1996; Khatri & Ng, 2000; Pyles & Stern, 1983). Gut feeling illustrates the physicality of intuition. Table 2.2 lists the empirical research that identifies physical awareness associated with intuition use.

In a qualitative study using a grounded theory method, experienced nurses detected cardiogenic shock in patients with myocardial infarction through gut feelings (Pyles & Stern, 1983). This study resulted in a theory called Nursing Gestalt, which described a matrix operation whereby nurses link basic knowledge and past experiences with sensory cues from the patient and gut feel. "It is a synergy of logic and intuition involving both conceptual and sensory acts" (Pyles & Stern, 1983, p. 53). Intuition is linked to sensory cues, experience, and gut feel.

The theme of gut feel also emerged in Isenberg's (1984) interviews with 12 senior managers and executives. Managers sensed a problem by gut feel and used this feeling to check with rational decision making methods. The use of gut feel demonstrated that intuition is an affective form of knowledge that influenced and complemented decision-making, an analytic and linear process.

Table 2.2

*Empirical Research That Identifies Physical Awareness Associated With Intuition*

| Reference | Methodology | Sample | Findings/Physical Awareness |
|---|---|---|---|
| Pyles & Stern, 1983 | Qualitative: Grounded Theory | Convenience sample: 28 critical care nurses from medical intensive care units (at least one year of clinical experience) | Gut feeling was how nurses sensed a change in the patient. Theory of Nursing Gestalt associated use of senses with intuition use. |
| Isenberg, 1984 | Qualitative: Interviews and observations | Convenience sample; 12 Senior Mangers and Executives. Gender not mentioned | Gut feeling was used with rational decision making processes |
| Khatri & Ng, 2000 | Quantitative: Correlation study: used questionnaire to collect data. | Convenience sample; 281 chief executive officers and senior managers from bank, utilities, and computer industries | Intuitive synthesis which included gut feelings was beneficial in an unstable environment |
| Rew, 1988b | Qualitative: Content analysis | Convenience sample; 11 registered nurses who worked in education, critical care, administration, and community mental health | Physical sensations associated with intuition: postural tightness, movement, general uneasiness, increased heart rate, racing blood, stomach tightness, and all senses turned on. |
| Davis-Floyd & Davis, 1996 | Qualitative: Conducted Interviews Content analysis | Convenience sample; 22 white middle class midwives from the United States; 3-16 years of experience | Physical sensations related to intuition included: sensations throughout the entire body. |
| Kelly, 1994 | Qualitative: Phenomenology Heideggerian hermeneutics | Purposive sample; 10 staff development experts | Primary pattern of trusting the inner voice emerged from data. |
| McCutcheion & Pincombe, 2001 | Qualitative: Grounded theory with focused groups | Convenience sample; 262 registered nurses (years of clinical experience not mentioned) | Theory of intuition developed that included the use of somatic symptoms. |

Gut feel was also influential in making strategic business decisions among chief executive officers and senior managers from the banking, utilities, and computer industries (Khatri & Ng, 2000). The findings of a correlational study suggested that intuitive synthesis, which was defined as reliance on judgment, past experience, and gut feelings, was beneficial in unstable environments (Khatri & Ng, 2000). Intuition involved the use of gut feel and experience, which complemented analytic decision making methods (Khatri & Ng, 2000).

There are other ways to physically perceive information from the environment. Chills down the spine, headaches, and muscle tightness are other physical responses that occur when intuition is identified. Experienced nurses described postural tightness, movement, general uneasiness, increased heart rate, racing blood, stomach tightness, and all senses turned on (Rew, 1988b). Other physical responses described were high energy, charged, accelerated, jaw clenching, and sweaty palms (Rew, 1988b).

Davis-Floyd and Davis (1996) found that the use of intuition by midwives and the physicality of knowing emulated from within the entire body or was recognized in certain areas of the body. The response of the midwives included, (a) "All through the body", (b) "It's cellular", (c) "It's in my stomach", (d) "My heart, my chest, my throat", and (e) "I hear it as a voice coming from deep inside" (Davis-Floyd & Davis, 1996, p. 247). The importance of connections was emphasized in the interpretations of the physical symptoms experienced by the midwives and intuition was labeled as an authoritative knowledge in home births.

Staff development experts described intuition as an inner voice (Kelly, 1994). Kelly (1994) defined intuition as a way of knowing throughout time and used Heideggerian hermeneutics to examine the nature of intuition as it is revealed in the everyday nursing practice of staff development experts. The primary pattern that emerged was "trusting the everyday whole knowing of the inner voice" (Kelly, 1994, p.143). This primary pattern described intuition as a physical awareness by labeling it as an inner voice.

Another theory of intuition also developed from grounded theory methods emphasized the importance of somatic symptoms when intuition is identified (McCutcheion & Pincombe, 2001). Intuition was described as a product of synergy, which is a result of an interaction among the factors of experience, expertise, knowledge, personality, environment, client relationships, and somatic symptoms.

*Summary.* For the purpose of this tool development, physical awareness is defined as the knowing that comes through body senses or physical sensations. Two nursing theories on intuition derived from grounded theory studies (McCutcheion & Pincombe, 2002; Pyles & Stern, 1983) related intuition to experience, knowledge, and sensory or somatic cues. In the qualitative and quantitative studies reviewed, intuition has been described as a gut feeling, underscoring the physicality of intuition.

*The Dimension of Making Connections*

Intuition is described in the literature as the making of connections or sensing of a relationship on the physical or spiritual level (Agan, 1987; Davis-

Floyd & Davis, 1996; Leners, 1992; Pyles & Stern, 1983; Rew, 1989; Schraeder & Fischer, 1987; Vaughan, 1979). Physical connections are relationships that take place between two people, and permit an understanding of body language and nonverbal communication. For example, a nurse is able to read the nonverbal cues of a patient and determine when there is a change in the patient's condition based on this connection (Pyles & Stern, 1983). Spiritual connections are abstract and involve the universal or spiritual connectedness of humans (Rew, 1989; Vaughan, 1979). They are of a universal nature and may involve an energy exchange or energy fields (Agan, 1987; Davis-Floyd & Davis, 1996; Leners, 1992).

*Physical connections*. In the nursing literature, experienced nurses describe physical connections as (a) identifying cues of the patient (Pyles & Stern, 1983), (b) feelings of relatedness (Schraeder & Fischer, 1987), and (c) direct patient contact (Young, 1987). Table 2.3 provides a summary of the nursing research that identifies the physical connections associated with intuition use.

Critical care nurses with at least one year of clinical experiences reported certain cues in the patient that indicated cardiogenic shock (Pyles & Stern, 1983). These cues included, "the look of the patient", "mental changes", "a funny pasty color," and "that greasy feeling" (Pyles & Stern, 1987, p. 53). Similarly, Schraeder and Fischer (1987) interviewed experienced nurses from a level three nursery and described the feelings of relatedness that allowed the nurses to perceive the nonverbal cues of the infant. By knowing or connecting with an infant, the nurse perceived cues that deviated from the norm.

Table 2.3

*Nursing Research That Identifies Physical Connections Associated With Intuition*

| Reference | Methodology | Sample | Findings/Physical Connections |
|---|---|---|---|
| Pyles & Stern, 1983 | Grounded theory | Convenience sample of 28 critical care nurses from medical intensive care units | Identification of cues of the patient (look of the patient, mental changes, and change in color or facial expressions) |
| Schraeder & Fischer, 1987 | Interviews, observations Content Analysis | Convenience sample of 15 NICU nurses; Experience ranged from 1-7 years | Identified feelings of relatedness and perceiving the nonverbal cues of infants |
| Young, 1987 | Grounded theory | Convenience sample; 41 females with all except 2 being RNs | Direct contact allowed the nurse to reflect on feelings related to the patient |
| Gray & Smith, 2000 | 3 year longitudinal grounded theory | Purposeful sample of 17 students | Students identified picking up the physical cues of the patient and reading nonverbal communication |

Also, intuitive nurses talked about reflecting on their feelings and the usefulness of their feelings after direct contact with a patient (Young, 1987). The direct contact allowed a connection to form so that the nurse could reflect on his/her feelings. This reflecting on feelings after making a connection with the patient illustrates an overlapping of this dimension of making connections with the dimension of emotional awareness.

Physical and emotional awareness play a role in connecting with a patient at the physical level. Turnball (1999) discussed the interpersonal relationships that a nurse and patient share and labeled this connection as the building of rapport. Building rapport with a patient depends on the development of sensory acuity. "The intensifying sensory acuity to the degree of noting eye movements, changes in facial color and muscle tone, and how the use of language may indicate thought processing, can provide information on which to base a nursing response" (Turnball, 1999, p. 305). For rapport, a connection is needed between a nurse and patient and it involves the use of senses to read the cues or the responses of the patient. The use of senses to connect with a patient also demonstrates an overlapping of the dimension of making connections with the dimension of physical awareness.

Nursing students also believed that intuition comes from knowing the patient better and picking up cues when the patient's condition changes (Gray & Smith, 2000). " Your intuition improves and you can pick up on their psychological states and read between the lines as to what they [patients] are saying and to know that there is something not quite right" (Gray & Smith, 2000, p. 644). An understanding of the patient's patterns of responses and knowing the patient as a person fosters a physical connection between the nurse and the patient.

*Spiritual connections.* The making of connections can also occur at the spiritual level. These connections are described in the theoretical literature (Goldberg, 1983; Rew, 1989; Vaughan, 1979) and demonstrated in the empirical

studies (Agan, 1987; Davis-Floyd & Davis, 1996; Leners, 1992; Schmidt, 1995). The nursing research literature gave evidence to the spiritual connections associated with intuition use and Table 2.4 lists the nursing studies that identify the spiritual connections associated with intuition. Spirituality and religion are not synonymous. Religion is a unifying force that provides the framework for values, codes of conduct, and rituals (Mansen, 1993). The dimension of making connections at the spiritual level encompasses a unifying framework and the interconnectedness of all aspects of life (Rew, 1989).

Table 2.4

*Nursing Studies That Identify Spiritual Connections Associated With Intuition*

| Reference | Methodology | Sample | Findings/Spiritual Connections |
|---|---|---|---|
| Agan, 1987 | Qualitative: Interviewed and used experiential analysis | Convenience sample; 7 holistic nurses (1 male and 6 females) | Spiritual connections with patients and sensing of energy linked to intuition |
| Leners, 1992 | Qualitative: Ethnography | Convenience sample; 40 nurses from all levels of a hospital. Experienced ranged from 1-40 years | Connections that are deep, spiritual, and at the soul level. |
| Davis-Floyd & Davis, 1996 | Qualitative: Interviews and analysis | Convenience sample; 22 white middle class midwives with 3-16 years experience | Intuition described as an energy exchange which is spiritual |

Vaughan (1979) and Goldberg (1983) incorporated spiritual awareness in their definitions of intuition. Rew (1989) described intuition as a spiritual connection and defined it as (a) a knowledge of prime reality, (b) a superior way of knowing superior truth, and (c) a knowledge of ultimate reality. Schmidt (1995) used the Delphi technique with a panel of 43 professionals (20 females and 23 males), who were interested in the topic of intuition, to characterize intuition. The themes that emerged when defining intuition included the spirituality of intuition and the relationship of intuition to the body. The spirituality in intuition connotes a connection between a person and some higher intelligence, plain, or consciousness (Schmidt, 1995).

The emphasis on a spiritual connection is reflective of the qualitative data from interviews with holistic nurses, who described intuition as a connection at the soul level (Agan, 1987; Leners, 1992). In Agan's (1987) interviews with seven holistic nurses, a connection between human beings and something greater is a theme that emerged in the analysis of the data. Intuition is identified as a way of knowing that is related to "a connection between the nurse and client, with a healing or spiritual source, and as part of a larger whole, such as field, humanity, or universe" (Agan, 1987, p. 66). Connections and energy are themes that surfaced in the research findings and the idea of a collective consciousness and common knowing are also alluded to in the findings.

Likewise, a deep connection was the overriding theme in an ethnography study used to describe the phenomena of intuition in nursing culture (Leners, 1992). Intuition was described as a knowing that comes through connections. The

nurse informants spoke of a "deep connection", a "true understanding", and a recognition". One participant stated, "Intuition is my ability to connect at a soul level with another person and in that connection there is a deeper ability to understand and to heal. It is a deep connection that I feel" (Leners, 1992, p.151).

Equally important, the sensing of energy is linked with spiritual connections (Agan, 1987; Davis-Floyd & Davis, 1996; Leners, 1992). A participant in Lener's (1992) study described intuition as an energy exchange, which is very spiritual and strong. Davis-Floyd & Davis (1996) stated that intuition is not wrong because it finds its source in the spiritual realm or from the deepest recesses of the body, which are energy fields operating in connection with other energy fields. The link between spiritual connections and energy fields is not fully developed in the literature, yet energy was predominantly linked to a spiritual connection.

*Summary.* The making of physical and spiritual connections is primarily developed in the nursing qualitative studies (Agan, 1987; Leners, 1992; Schraeder & Fischer, 1987; Young, 1987). The theoretical literature primarily from the discipline of psychology also makes reference to the spiritual awareness and universal connections that are involved with intuition (Bolen, 1979; Goldberg, 1983; Schmidt, 1995; Vaughan, 1987). Physical connections foster an understanding of body language or nonverbal communication. On the other hand, spiritual connections emphasize the universal and spiritual connectedness of all humans, as well as the sensing of energy.

*Summary of Intuition Dimensions*

The dimensions of intuition identified in the literature review include (a) emotional awareness, (b) physical awareness, and (c) the making of connections at the physical or spiritual level. A list of the dimensions and their definitions is found in Table 2.5. These definitions were formulated based on the review of literature. Emotional awareness is the feelings associated with empathy, while physical awareness involves the body sensations experienced in a situation. Emotional feelings are feelings that cannot be pinpointed to a particular area of the body. The making of connections at the physical or spiritual level is the sensing of a relationship, which also fosters a knowing.

Table 2.5

*Dimensions of Intuition*

| Dimension: | Definition: |
|---|---|
| Emotional awareness | Awareness or knowing comes through feelings or empathy. |
| Physical Awareness | Awareness or knowing comes through the body senses or physical sensations. |
| Making Connections: | The sensing of a relationship on a physical or spiritual level. Physical connections or relationships take place between two people. This type of connecting fosters or permits an understanding of body language or nonverbal communication. Spiritual connections emphasize the universal and spiritual connectedness of humans and the sensing of energy or energy fields. |

Emotional awareness and physical awareness overlap with making connections at the physical or spiritual level, demonstrating the complexity of intuition and the interconnection of all three dimensions. For example, feelings may be confused with physical sensations and the empathy that is involved with emotional awareness can be confused with a connection or relationship at a physical or spiritual level. These three dimensions of intuition are reflective of how intuition has been conceptualized in the literature, which is as a nonlinear process of knowing perceived through physical and emotional awareness or through the making of connections at the physical and/or spiritual level.

*Antecedent Variables That Influence Intuition Use*

Two antecedent variables that influence the use of intuition emerged in the review and analysis of the theoretical and empirical literature: personal characteristics and uncertain circumstances. Personal characteristics include (a) self-confidence, (b) open mindedness, (c) spirituality, and (d) experience, while uncertain circumstances refer to the instability of the environment. These antecedent variables are not essential for intuition use but they positively influence the use of intuition (Agor, 1986b; Khatri & Ng, 2000; Miller, 1995; Rew, Agor, Emery & Harper, 1991).

The nursing and business literature primarily focused on the characteristics and demographic profile of the intuitive nurse or business manager (Agor, 1984, 1986a, 1986b, 1989; Miller, 1993, 1995). Self-confidence, open mindedness, and spirituality were characteristics of intuitive persons that surfaced

in the research that used samples of experienced practitioners (Agor, 1984; Miller, 1995; Williams, 1990; Young, 1987).

In the process of developing a tool to measure the intuitiveness of a nurse, Miller (1995) described the intuitive nurse as (a) an experienced practitioner, (b) a spiritual person, (c) confident in intuition, and (d) open-minded. Likewise, Agor (1984) described the intuitive business manager as being open minded. Furthermore, Williams (1990) stressed the need for spirituality and open mindedness when using intuition to make a business decision. In addition, Young (1987) listed experience, self-receptivity (being open and vulnerable), and self-confidence as personal dimensions that facilitated intuition use by experienced nurses. Moreover, Rew, Agor, Emery, and Harper (2001) described nurses who used intuition in a crisis situation as being more self-confident and open minded. Finally, Gray and Smith (1999) identified self-confidence as a pre-requisite for the development of intuitive abilities among nursing students.

The antecedent variable of uncertain circumstances or an unstable environment surfaced in the intuition research. The business and nursing literature emphasized the status of the environment where intuition is utilized (Agor, 1986b; Cioffi, 1997; Rew, Agor, Emery & Harper). Managers using intuition functioned better in a rapidly changing environment or in a crisis situation (Agor, 1986b). Simultaneously, Cioffi (1997) described intuition as making decisions in uncertain circumstances. In like manner, Khatri and Ng (2000) also determined that the use of intuition had better outcomes in an unstable environment and that

organization performance was negatively affected by the use of intuition in a stable environment.

Experience was the predominant antecedent variable that influenced the use of intuition. The notion of experience permeated the multidisciplinary literature (Agor, 1989; Benner, 1984; Benner & Tanner, 1987; Brockmann & Simmonds, 1997; Cioffi. 1997; Easen & Wilcockson, 1997; Gray & Smith, 1999; Isenberg, 1984; Khatri & Ng, 2000; Leners, 1992; Rosanoff, 1999; Schraeder & Fischer, 1987; Simon, 1987; Young, 1987). Experience played a vital role in decision making, knowing, and connecting. Although the literature has focused on the role of experience in the use of intuition, it is not a requirement for intuition use. In summary, personal characteristics consisting of spirituality, self-confidence, open-mindedness, and experience as well as uncertain circumstances were found to influence the use of intuition (Agor, 1984, 1986a, 1989; Miller, 1993; Rew, Agor, Emery, & Harper, 2002; Williams, 1990; Young, 1987).

### *Available Intuition Instruments*

There are developed instruments from multiple disciplines that measure intuition. The discipline of nursing has three instruments (a) the Acknowledges Using Intuition in Nursing Scale (Rew, 2000), (b) the Miller Intuitiveness Instrument (Miller, 1993), and (c) the Himaya Intuition Semantic Scale (Himaya, 1991). The discipline of psychology has two well-known instruments, the Myers-Briggs Type Indicator (Briggs-Myers & McCaulley, 1985) and Westcott's Test of Intuitive Ability (Westcott, 1968). The Agor Intuitive Management Survey (Agor,

1989) developed for measuring the use of intuition by the business executive is another available intuition instrument.

*The Acknowledges Using Intuition in Nursing Scale*

The Acknowledges Using Intuition in Nursing Scale (AUINS) (Rew, 2000) is a 7-item one-dimensional Likert scale that measures a nurse's acknowledgement of using intuition in clinical decision-making. Rew (2000) defined intuition in the clinical situation as, "a component of complex judgment, the act of deciding what to do in a perplexing, often ambiguous and uncertain situation" (p. 95).

Construct validity was tested in a convenience sample of 112 registered nurses enrolled in continuing education courses. The sample included 6 males and the ages of all the participants ranged from 25-63 years. The clinical experience ranged from less than one year to 41 years. The Cronbach's alpha coefficient was .91. Factor analysis for the one-dimensional scale was performed and all items had loadings greater than .72.

The development of this 7-item scale is in the preliminary stage. Intuition is being measured as making decisions in an ambiguous situation. This instrument has only been tested in experienced. None of the dimensions identified in this literature review are measured by this nursing measure.

*The Miller Intuitiveness Instrument*

The Miller Intuitiveness Instrument (MII) (Miller, 1993) is a 43-item Likert scale that quantifies the self-perception of intuitiveness in the practicing

nurse. Miller (1993) identified six characteristics of intuitive nurses from a review of the nursing literature. These characteristics included (a) acknowledgment of intuitive experiences, (b) confidence in intuition, (c) skilled in clinical practice, (d) willingness to take unconventional approaches to problem solving, (e) awareness of spirituality in practice, and (f) interest in abstract issues (Miller, 1993).

Stability, internal consistency, construct validity, and criterion-related validity were examined. A convenience sample of registered nurses was selected from a list of registered nurses from the Texas Board of Nurse Examiners. The criteria for selection of the sample required that the participant be a registered nurse who provided direct patient care for at least 8 hours a week in any clinical setting. The newly developed scale (MII), a demographics questionnaire, the Myers-Briggs Type Indicator, and a cover letter were sent to 1,075 prospective participants. Only 228 participants returned usable data.

The test-retest reliability for an interval of 15 days was r =. 85 and the Cronbach's coefficient alpha is .94. Factor analysis identified five factors and the factors were labeled as Factor 1, willingness to act on intuition; Factor 2, skilled innovator; Factor 3, spiritual; Factor 4, interest in abstract; and Factor 5, risk taking. Criterion related validity was examined through the use of the Myers-Briggs Type Indicator (MBTI). Evidence of criterion-related validity was demonstrated by the positive relationship between the intuition score on the MBTI and the total score of the MII (Miller, 1993).

This instrument is easy to administer and complete. The reliability and validity are thoroughly described by the author although a larger response rate is needed for further psychometric testing. This instrument has not been tested in samples of nursing students and may not be appropriate for students because scale items relate to the autonomy of nursing practice. It does not measure any of the identified dimensions of intuition.

*The Himaya Intuition Semantic Scale*

The Himaya Intuition Semantic Scale (HINTS) (Himaya, 1991) was developed by a nurse with the goal of measuring intuition and helping nurses gain information on their preferred mode of decision making. Himaya (1991) defined intuition as "an unstructured mode of reasoning and global knowledge which involves understanding the inner nature of things without a rationale or consensus" (p. 22).

Himaya (1991) identified four dimensions of intuition (a) wholeness, (b) approximation, (c) spontaneity, and (d) personalization. Wholeness is grasping a situation in it is entirety. Approximation is sudden recognition or judgment of an object or event without reference to documentation. Spontaneity is a shock of recognition when not thinking in a linear fashion. Personalization or creativity is the empathy that comes from within and is not empirically validated (Himaya, 1991). The four components make up the construct for this instrument.

The semantic instrument is a 44-items self-report scale that takes approximately fifteen minutes to complete. The sample used to test the newly developed tool was randomly selected from a published directory of licensed

registered nurses in a selected southern state. The sample size was 450 and predominantly female, married, white, and employed mostly in the hospital setting. Testing of content validity, construct validity, and reliabilities was conducted. Exploratory factor analysis was used to test construct validity and the findings supported the four components identified in the construct. The alpha coefficient is 0.8870.

This instrument provides a means to identify how one makes decisions but it may be difficult to assert that the use of intuition is taking place in the patient care setting. The sample used to test the psychometric properties of this instrument did not include nursing students. Nursing students could use this tool because it does not emphasize clinical experience. This instrument does not measure any of the identified dimensions of intuition.

*The Myers-Briggs Type Indicator Test*

The Myers-Briggs Type Indicator Test (MBTI) (Briggs-Myers & McCaulley, 1985) is used by many disciplines and is very popular in the general sector. It is a forced-choice, self-report inventory that is used to classify individuals according to Jung's theory of conscious psychological types. The test is used to identify the preference of an individual in regard to perception and judgment (Briggs-Myers & McCaulley, 1985). The dimension of perception is how the person prefers to orient to data from the environment. The polar preferences are sensing and intuition. Sensing is paying attention to facts and details through the five senses, whereas intuition is more global, unconscious, and considering of possibilities.

The disadvantage of the Myers-Briggs Type Indicator (Briggs-Myers & McCaulley, 1985) is that it is testing the personality type of the individual and how a person perceives information from the environment, not the use of intuition. The individual may view data from the environment in an intuitive manner but measuring the use of intuition in the nursing care context is not occurring. Content validity, construct validity, and criterion-related validity have been tested. Presently Form M is the current form of the MBTI. Available manuals provide detailed information and psychometric values for specific samples. It does not measure any of the identified dimensions of intuition.

*The Westcott's Test of Intuitive Ability*

The Westcott's Test of Intuitive Ability is a frequently used scale to measure intuition in the discipline of psychology (Shirley & Langan-Fox, 1996). The test is comprised of 20 questions in which the subject must solve the problems using as few clues as possible. There are four types of problems to solve (a) verbal series problems, (b) verbal analog problems, (c) numerical series problems, and (d) numerical analogy problems (Westcott, 1968). The problems were developed empirically and do not require particular subject-matter knowledge. Intuition is the making of inferences on little information and getting the correct answer.

The validity testing of the instrument is not mentioned in the description of the instrument (Westcott, 1961, 1966, 1968). The instrument was determined to be reliable and stable for measuring intuitive thinking over a 3-year period in a sample of female university students (Westcott, 1966). The corrected split-half

reliabilities (.80, .61, .70) and test-retest reliabilities (.50, .63, .66) were calculated with values of $p < .01$. This instrument does not measure any of the identified dimensions of intuition identified in the literature.

This scale takes into consideration the limited knowledge of the student and the use of a nonlinear process to solve the problems. Westcott's (1968) use of college students to test the psychometric properties of the instrument is important to consider. College students are not considered experts. The use of non-experts in the examination of intuition supports the notion of examining intuition use by nursing students.

*The Agor Intuitive Management Survey*

Agor (1984, 1986a, 1986b, 1989) developed a survey to measure the use of intuition by business managers. The Agor Intuitive Management Survey (AIM Survey) has been tested in more than 3,000 managers nationally, both from private sector businesses and public sector organizations (Agor, 1989). Executives from all levels of management completed this instrument and there is available data on national norms categorized by management level, gender, ethnic background, and occupational specialty.

The development of the AIM Survey is unique in that the 12 forced-choice questions in Part I were taken from the intuition-sensing portion of the Myers-Briggs Type Indicator (Form F) (Briggs-Myers & McCaulley, 1985). Form F was copyrighted in 1962. Part II of the survey contains open-ended questions requiring written answers as well as questions pertaining to demographic information. The

open-ended questions elicit more information that would demonstrate that intuition plays a role in the making of management decisions.

The AIM Survey has been widely used in the business sector and has been used for validity testing of nursing instruments (Rew, 2000). While Agor (1983) stated that the AIM Survey is valid and reliable, there is no information on the psychometrics properties. The AIM Survey took only a portion of the MBTI; thus psychometric information can be generated separately for this intuition-sensing section. This instrument does not measure any of the identified dimensions of intuition.

*Critique of Existing Research and Gaps in the Intuition Knowledge*

An identified strength of the multidisciplinary research is that intuition is explored through both quantitative and qualitative methods. The findings from the empirical literature supported the theoretical discussions found in the multidisciplinary literature. The multiple research methodologies used to explore the concept of intuition facilitated the identification of measurable dimensions of intuition.

The primary limitation of the intuition research was the make up of the samples. Many studies did not fully describe the gender, characteristics, and experience level of the samples used (Hansten, 2000; Isenberg, 1984; Khatri & Ng, 2000; McCutcheion & Pincombe, 2001; Young, 1987). The samples used were primarily samples of convenience. Another omission was the lack of or limited number of males included in the samples, primarily in the nursing studies. The gender of the sample is considered because it should be determined if males

use the word "feeling" or different metaphors to describe intuitive experiences. The size of the samples used for the qualitative research studies appeared to be adequate. The sample size and diversity for the psychometric testing of the nursing intuition instruments could have been larger especially for the purposes of establishing reliability and validity (Himaya, 1991, Miller, 1993; Rew, 2000).

The samples utilized in the intuition studies were primarily made of experienced nurses or experienced business managers (Agor, 1989; Agan, 1987; Isenberg, 1984; Rew, 1988a, 1988b, 1990; Schraeder & Fischer, 1987). Nursing students, who lack clinical expertise, were not included in the samples used to explore intuitive experiences. The nursing student was not included in these samples because the primary focus of many of these studies was on the role of intuition in decision making not on examining intuition as a source of knowledge (Rew, 1988a, 1988b, 1990). Nursing students are not likely to be in the position to make autonomous decisions in the clinical setting.

While the samples were primarily made up of experienced nurses in the studies that demonstrated the emotions, physical sensations, and connections associated with intuition use, Pyles and Stern (1983) concluded that mentors are able to facilitate nursing gestalt, the use of logic and intuition in the novice. This conclusion supports the fostering of intuitive abilities among nursing students and the need to measure intuition use by nursing students. By defining intuition as a nonlinear way of knowing, perceived through emotions, physical sensations, and connections, measurement of intuition use by nursing students is realistic task despite their lack of experience.

The six available intuition instruments that were described do not measure any of the three dimensions identified in the multidisciplinary literature review. None of the developed instruments have been tested in samples of nursing students. The AUINS (Rew, 2000) and the HINTS (Himaya, 1991) defined and measured intuition in the context of decision-making. The MBTI (Briggs-Myers & McCaulley, 1985) and the AIM Survey (Agor, 1989) defined intuition as global, unconscious, and the considering of possibilities. The Westcott's Test of Intuitive Ability defined and measured intuition as getting the correct answer. None of the discussed intuition instruments measured intuition as a knowing or as knowledge gained from emotional awareness, physical awareness, and the making of connections.

A prominent gap in the literature is that there is no established intuition instrument designed specifically for the nursing student. An instrument designed specifically for the nursing student is a demonstrated need as well as an instrument that measures intuition as a knowing. A valid and reliable instrument developed to measure the use of intuition by the nursing student needs to focus on the dimensions of emotional awareness, physical awareness, and the making of connections at the physical and spiritual level. Measuring the use of intuition by nursing students can demonstrate whether nursing students use this type of knowledge and can serve as a catalyst in fostering awareness of intuitive abilities among nursing students.

*Summary*

Intuition has been defined and conceptualized in the nursing, business, education, medical, and psychology literature as a nonlinear process of knowing that is perceived through emotional awareness, physical awareness, and/or through the making of connections at the physical or spiritual level. This definition is reflective of the three identified dimensions of intuition (a) emotional awareness, (b) physical awareness, and (c) the making of connections.

The theoretical and empirical literature related to intuition is vast and encompassing of many disciplines. Research findings demonstrated the use of emotional awareness when caring for patients or making decisions (Hansten, 2000; King & Clark, 2002; Ling & Luker, 2000; Rew, 1988a, 1988b, 1990; Young, 1987). Feelings were either of a positive, encouraging, or reassuring nature or of a negative, apprehensive, or ominous nature. Intuition was also linked to sensory cues, experience, gut feel, and decision-making (Davis-Floyd & Davis, 1996; Isenberg, 1984; Kelly, 1994; Khatri & Ng, 2000; McCutcheion & Pincombe, 2001; Pyles & Stern, 1983). Finally, intuition is identified as a knowing that comes from connections made at the physical or spiritual level (Agan, 1987; Leners, 1992; Pyles & Stern, 1983; Schraeder & Fischer, 1987; Young, 1987).

Spirituality, self-confidence, open-mindedness, experience, and uncertain circumstances were identified as antecedent variables that influenced intuition use. Established intuition measures from the disciplines of nursing, business, and

psychology were described but the available instruments measured none of the identified dimensions of intuition defined in this literature review.

Measurement of the perceptions of physical and emotional sensations and the connections that take place at a physical or spiritual level operationalize the abstract and complex concept of intuition. The identified dimensions of intuition make measurement of intuition use by nursing students a realistic task. The purpose of this study is to develop an instrument specifically designed to measure the use of intuition among nursing students.

# CHAPTER 3

# METHODOLOGY

The need for an instrument that measures the use of intuition by nursing students was supported by a review of the theoretical and empirical literature. The methodology used to develop and psychometrically test the newly developed intuition instrument is described in this chapter.

## *Development of the Intuition Instrument*

Instrument development took place in three phases. These phases incorporated the stages of instrumentation described by Mishel (1989). The activities for instrument development outlined by Mishel (1989) included (a) clarifying the concept, (b) developing the theoretical definition, (c) operationalizing the concept, (d) developing the items, (e) pretesting the instrument, and (f) establishing reliability and validity. These specific activities enhance control and decrease measurement error.

The three phases of development for this intuition instrument included (a) concept clarification (b) item development, and (c) psychometric testing of the newly developed instrument. Table 3.1 lists the phases of instrument development and the activities for this study undertaken for each phase. These phases were reflective of the stages outlined by Mishel (1989).

Table 3.1

*Phases of Instrument Development*

| Phases of Development for the Intuition Instrument: | Stages of Development Recommended by Mishel's (1989): | Activities Performed at Each Phase: |
|---|---|---|
| Phase 1: Concept Clarification | •Clarifying the concept (Literature review)<br>•Developing the theoretical definition, which includes the dimensions of the concept. | 1. Reviewed intuition literature from multiple disciplines<br>2. Determined how intuition conceptualized in literature<br>3. Formulated a concept definition for intuition based on literature review<br>4.Identified measurable dimensions of intuition<br>5. Examined available intuition instruments<br>6.Developed a conceptual framework that provided a visual diagram of how intuition is conceptualized by using the identified dimensions of intuition |
| Phase 2: Item Development | •Operationalizing the concept.<br>• Developing items<br>•Pretesting the instrument | 1.Created initial items for each dimension of intuition<br>2. Seven experts evaluated the content validity of initial instrument<br>3. Determined scaling<br>4. Pretested the newly developed instrument in convenience sample of senior nursing students |
| Phase 3: Psychometric Testing | • Establishing reliability and construct validity | 1. Administered new instrument to a randomly selected sample of senior nursing students<br>2. Determined the construct validity through principal component factor analysis<br>3. Determined the reliability of instrument by calculating the Cronbach's alpha for each factor and for the total measure |

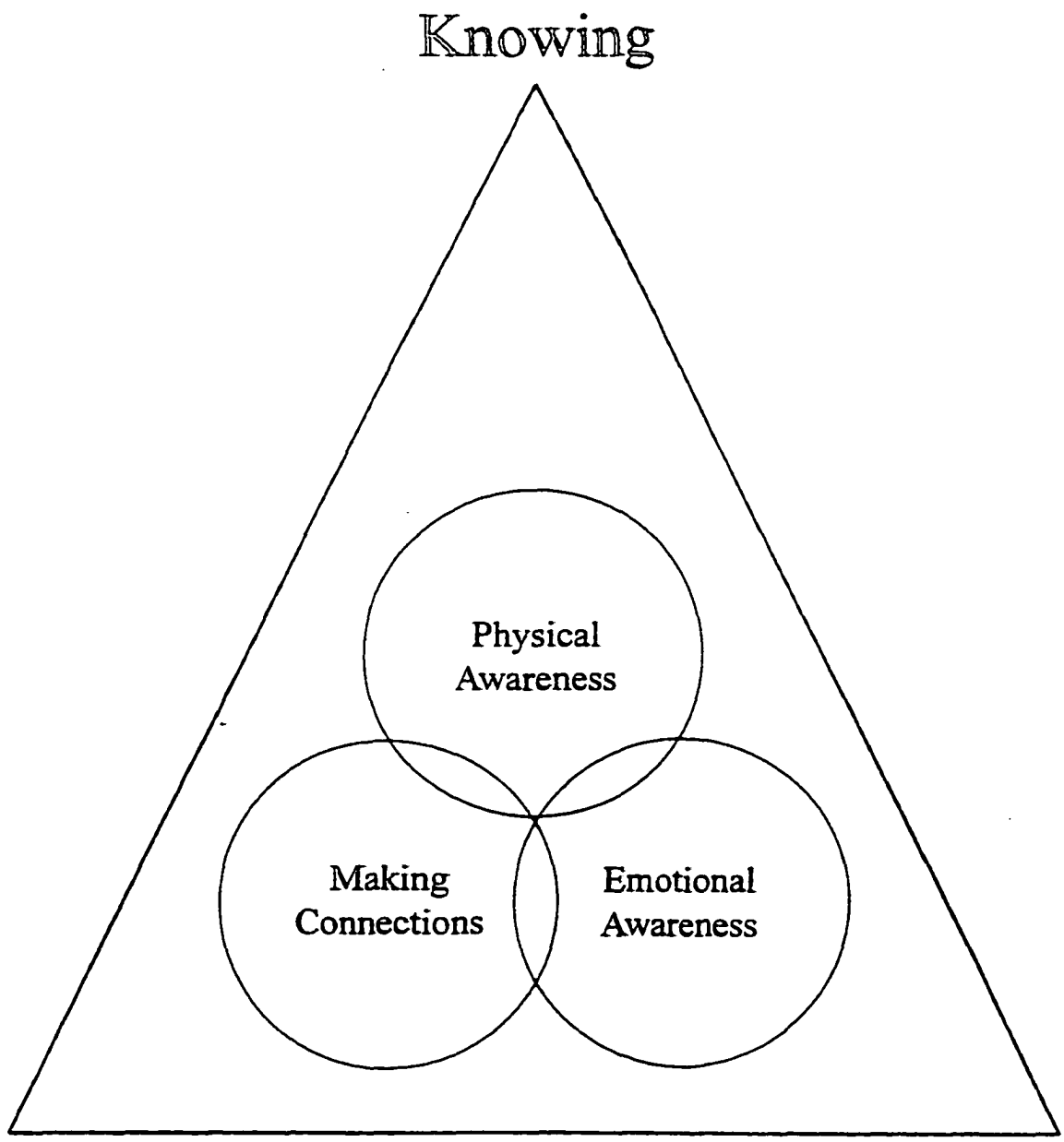
*Phase 1: Concept Clarification*

Clarifying the concept of intuition involved reviewing the literature from multiple disciplines, defining intuition, identifying dimensions of intuition, and reviewing the existing intuition measures. Theoretical and empirical literature was reviewed. Intuition was conceptualized as (a) a knowing, (b) the making of connections at the physical or spiritual level, (c) a nonlinear process that complements analysis, and (d) difficult to articulate. Dimensions of intuition identified in the literature review included (a) emotional awareness, (b) physical awareness, and (c) the making of connections. An examination of the available intuition instruments demonstrated that these three identified dimensions of intuition have not been measured.

The concept of intuition was defined as a nonlinear process of knowing that is perceived through physical awareness, emotional awareness and/or through physical or spiritual connections. A conceptual framework was designed to link the dimensions of emotional awareness, physical awareness, and the making of connections as the basis of knowing. Figure 3.1 illustrates the linkage of these dimensions and their relationship to knowledge in a visual diagram.

The overlapping of circles within the pyramid illustrates the nonlinear nature of intuition and the three sources of knowledge. Knowing located at the top of the pyramid comes through physical awareness, emotional awareness, and the making of connections. The three overlapping circles within the pyramid also represent the difficulty in verbalizing this knowledge and the difficulty in identifying the source of knowledge.

*Figure 3.1. Conceptual Framework*



*Phase 2: Item Development*

Development of the instrument involved (a) creating the initial scale items, (b) establishing content validity, (c) determining the scaling, and (d) pretesting the newly developed instrument in a sample of senior nursing students.

*Item Construction.* Scale items were constructed by the researcher for the dimensions of emotional awareness, physical awareness, and the making of connections. Methods of generating scale items were outlined by Mishel (1989) and included (a) reviewing the literature, (b) using literature reviews and interviews with experts, (c) selecting items from existing scales, and (d) performing a qualitative investigation with the target population. To generate items for each dimension, the researcher closely examined the available narratives and quotes from interviews published in the intuition research. Scale items from existing intuition instruments were not used because these instruments did not measure any of the three dimensions of intuition.

Additionally, senior nursing students and new graduates were interviewed to explore the concept of intuition. Exploring the concept of intuition was done to fulfill the requirements for two doctoral courses focusing on qualitative research designs. The professor for each course obtained approval from the university's Internal Review Board. While these two selected groups are not traditionally thought of as experts, they are representative of the target population in this study. Table 3.2 lists a sample of the comments made by senior nursing students and new graduates that are reflective of the identified dimensions of intuition.

Table 3.2

*Sample Comments Reflective of Intuition Dimensions*

| Dimension | Comments by Senior Nursing Students and New Graduates |
|---|---|
| Physical Awareness | "Gut feeling"<br>"If I foresaw it happening"<br>"Tells you to do something"<br>"Really on my back"<br>"You listen to it" |
| Emotional Awareness | "Underlying feeling on a situation"<br>"Really bad feeling"<br>"It's just a feeling inside, whether you intrinsically know something is right or wrong"<br>"It is something you feel inside"<br>"Getting an odd feeling" |
| Making Connections | "Because of a feeling he put off"<br>"Mother's intuition, your connection with a child"<br>"Energy level of the house seemed unreal" |

Mishel (1989) stressed the need to generate twice as many items as one would like the final scale to contain. It was anticipated that the final scale would contain 24-30 items. The researcher generated 15-20 items for each dimension. The generated items were configured into a scale designed for testing content validity. There were 56 items in the scale used to test content validity.

*Establishing content validity.* The scale with the newly generated items was given to seven experts for testing content validity (Appendix A.) Lynn (1986) recommended a minimum of five experts to provide sufficient level of control for chance agreement among the experts examining the test items. Waltz, Strickland, and Lenz (1991) recommended that content experts (a) link each item to the identified dimensions, (b) assess the relevancy of the items to the content of

the dimension, and (c) judge whether the item adequately represents the content of the dimension.

The selection of content experts is based on clinical expertise, a history of publishing in refereed journals, national presentations, and research on the phenomena of interest (Grant & Davis, 1997). The criterion used to select the content experts for the development of this instrument was clinical expertise in a nursing specialty and experience with educating nursing students. A panel of experienced nurses with diverse clinical backgrounds is representative of the clinical experiences students are exposed to in an entry level nursing program.

The expert panel consisted of nurses with experience in acute care, adult mental health, critical care, medical-surgical nursing, pediatrics, school nursing, and women's health nursing. The years of clinical experience in the nursing specialties ranged from 14 to 30 years. Table 3.3 lists the clinical specialty and years of experience of the seven experts.

Table 3.3

*Clinical Specialty and Years of Experience of Content Experts*

| Content Expert | Specialty | Years of Experience |
|---|---|---|
| #1 | Acute Care | 25 |
| #2 | Adult Mental Health | 14 |
| #3 | Critical Care | 24 |
| #4 | Medical-Surgical | 20 |
| #5 | Pediatrics | 21 |
| #6 | School Nursing | 30 |
| #7 | Women's Health | 22 |

Prior to completing the content validity scale, each member of the panel was provided information on the conceptual underpinnings of the instrument development (Grant & Davis, 1997). The seven experts were given the content validity scale with an instructional note that listed the intended purpose of the new instrument and provided directions that delineated what was expected of the expert. The experts were asked to determine the validity of the items, which required assessing the content and relevancy of each item. The experts were also asked to judge whether the item adequately represented the content of the dimension. To judge validity, the experts rated each item using a 4-point rating scale: (1) not valid, (2) somewhat valid, (3) quite valid, and (4) very valid. To judge the representativeness of each item, the experts were asked to circle yes or no to indicate whether the item represented the dimension. The content validity scale also provided space for the expert to provide written feedback on the clarity of the item and to discuss whether the item was appropriate for the dimension.

To accept an item as valid, five of the seven experts had to rate an item as quite valid (3) or very valid (4) (Lynn, 1986). The Content Validity Index (CVI) for each dimension was obtained by determining the proportion of items rated as valid by the experts over the total number of items rated for the dimension (Waltz, Strickland & Lenz, 1991). The CVI for the entire instrument was obtained by determining the proportion of the total number of valid items over the total number of items in the instrument. The CVI for the entire scale was .79. Forty-four items out of 56 items were rated as valid. The CVI for the dimension of emotional awareness was .83, for the dimension of physical awareness .78, and

for the dimension of making connections .75. Table 3.4 shows the CVIs for the initial scale and each dimension. The validity rating and the CVI for each item created by the researcher are listed by dimension in Appendix B.

Table 3.4

*Content Validity Index for Initial Intuition Scale and Each Dimension*

| Scale/Dimension: | CVI |
|---|---|
| 56-Item Scale | .79 |
| Dimension: Emotional Awareness | .83 |
| Dimension: Physical Awareness | .78 |
| Dimension: Making Connections | .75 |

*Item selection and scaling.* The newly developed instrument measures the use of intuition by nursing students. It is a behavior scale that measures the frequency of intuitive experiences. Items used in the final scale were those that received a valid content rating and had a CVI of .86 or 1.00. If 6 out of the 7 experts rate an item as quite valid or very valid, the CVI for the scale item is .86 (Lynn, 1986). Although 44 items were rated as valid, only 33 items were included in the scale to be tested. The 33 items were chosen based on the CVI and feedback provided by the content experts. Table 3.5 lists the valid items by dimension that were retained in the 33-item intuition instrument.

Table 3.5

*List of Valid Items Retained in 33-Item Intuition Instrument*

| |
|---|
| Emotional Awareness: |
| 1. I get a persistent feeling about a patient's condition. |
| 2. I get a bad feeling about a patient's condition. |
| 3. I get a good feeling about a patient' s condition. |
| 4. I get an odd feeling about a patient's condition. |
| 5. I have caring feelings for my patient. |
| 6. I get a nagging feeling about a patient's condition. |
| 7. I feel something will happen before it happens. |
| 8. I experience ominous feelings when caring for a patient. |
| 9. I am aware of my patient's feelings. |
| 10. I feel anxious when I think something is wrong will go wrong. |
| 11. I get a calm feeling with I know things will be okay. |
| 12. I get a peaceful feeling when I know my patient is stable. |
| Physical Awareness: |
| 1. I experience a gut reaction when something is wrong with my patient. |
| 2. I get a sinking feeling in my stomach when something is about to go wrong with my patient. |
| 3. My muscles tighten when I think something is wrong with my patient. |
| 4. My heart beats fast when I think something is wrong with my patient. |
| 5. The hair on my arms and neck stand up when something is wrong with my patient. |
| 6. I get a lump in my throat when something is wrong with my patient. |
| 7. I get a shiver down my spine when I think something is wrong with my patient. |
| 8. I feel cold when something is wrong with my patient. |
| 9. I feel nauseous when something is wrong. |
| Making Connections: |
| 1. I can read my patient's expressions. |
| 2. I sense positive energy coming from my patient. |
| 3. I sense negative energy coming from my patient. |
| 4. I sense an energy field around my patient. |
| 5. I understand my patient even if we do not speak to each other. |
| 6. I read the nonverbal body language of my patient. |
| 7. I recognize the spirituality of my patients. |
| 8. I sense a spiritual connection with my patients. |
| 9. I connect with my patients at the soul level. |
| 10. I experience a deep connection with my patients. |
| 11. I do not need verbal communication to sense a spiritual connection with m patient. |
| 12. I read the nonverbal cues of my patient. |

The final scale is a 5-point Likert-type scale. The responses on the final scale indicate the frequency of intuitive behaviors used by the nursing student. The five responses included (a) never, (b) rarely, (c) sometimes, (d) often, and (e) always. There are two absolute responses, always and never, and three that vary. The choices of rarely, sometimes, and often allow the nursing student to discriminate meaningfully without being overwhelmed by too many responses (DeVellis, 1991). No reverse items were used. While the use of reverse or negatively worded items decrease response set bias, Glaser (2000) indicated that negatively worded items may unintentionally introduce a new construct.

*Pretesting.* Pretesting of the developed instrument in a small sample of nursing students was performed. Pretesting the instrument allowed this researcher to determine if the directions and items were clear to the students and to identify potential problems prior to the administration of the instrument to a larger sample of nursing students. It provided the opportunity to simulate the conditions and direct experience of the study (Mishel, 1989). Pretesting also determined the time requirements for completing the scale.

A convenience sample of 20 nursing students enrolled in a bachelor's of science in nursing program was used to pretest the newly developed instrument. Approval was obtained from the university's Internal Review Board where the convenience sample was drawn. The pilot sample received a packet containing (a) an informed consent, (b) a demographic information sheet, and (c) the newly developed instrument (Appendix C). The instrument administered to the students provided space for them to make comments on the clarity of the items and

problems that they encountered in completing it. They were also asked to state how long it took to complete the entire packet of paperwork.

Of the 20 students in the convenience sample, 18 (90%) returned a completed packet. Table 3.6 summarizes the demographic information collected from the pretest sample. The sample consisted of 13 females and 5 males. The ages of the sample ranged from 21-40 years of age. The ethnic background included 12 Caucasians, 1 African- American, 3 Hispanics, and 2 of Asian descent. Seventy-eight percent of the students worked as nursing assistants and 11% worked as a licensed vocational nurse. Eighty-three percent considered themselves to be spiritual, 72% participated in a religious group, and 78% identified themselves as Christians.

The minimal feedback from the pretesting focused mainly on several of the demographic questions and on the vocabulary used for the items in the instrument. No changes were made to the directions. The word "ominous" was removed from one item and replaced with the phrase "feeling of dread". Several of the demographic questions were reworded. Based on the feedback provided by the sample of senior students the time requirements for completing the consent, demographic questions, and instrument was estimated to be 10-15 minutes.

Table 3.6

*Demographic Characteristics of Pretest Sample (N=18)*

| Characteristic | N | % |
|---|---|---|
| Age | | |
| 20-25 years of age | 11 | 61 |
| 26-30 years of age | 2 | 11 |
| 31-35 years of age | 2 | 11 |
| 36-40 years of age | 3 | 17 |
| Gender | | |
| Female | 13 | 72.2 |
| Male | 5 | 27.8 |
| Ethnicity | | |
| Caucasian | 12 | 66.7 |
| African American | 1 | 5.6 |
| Hispanic | 3 | 16.7 |
| Asian American/Pacific Islander | 2 | 11.1 |
| American Indian | 0 | 0 |
| Other | 0 | 0 |
| Type of Nursing Program | | |
| BSN | 18 | 100 |
| Worked as a Nursing Assistant: | | |
| Yes | 14 | 77.8 |
| No | 4 | 22.2 |
| Years as a Nursing Assistant: | | |
| 0-1 year | 8 | 47.1 |
| 1-2 years | 0 | 0 |
| 2-4 years | 9 | 0 |
| Over 4 years | 0 | 52.9 |

| | | |
|---|---|---|
| Worked as a LVN/LPN | | |
| Yes | 2 | 11.8 |
| No | 15 | 88.2 |
| Years as a LVN/LPN | | |
| 0-1 year | 0 | 77.8 |
| 1-2 years | 0 | 0 |
| 2-4 years | 0 | 0 |
| Over 4 years | 2 | 22.2 |
| Consider Self Spiritual | | |
| Yes | 15 | 83.3 |
| No | 2 | 11.1 |
| No response | 1 | 5.6 |
| Participate in a Religious Group | | |
| Yes | 13 | 72.2 |
| No | 5 | 27.8 |
| Religious Affiliation: | | |
| Christian | 14 | 87.5 |
| Hindu | 0 | 0 |
| Jewish | 0 | 0 |
| LDS | 0 | 0 |
| Muslim | 0 | 0 |
| Other | 4 | 12.5 |

The Statistical Package for Social Sciences, (SPSS) version 10.1 was used to compute the frequency and percentage of the demographic characteristics of the sample and to determine the alpha coefficient of the measure. An alpha reliability of .74 was obtained for the entire 33-item scale. No item was predicted

to increase the alpha coefficient if deleted. Due to the small sample size, factor analysis was not performed to make decisions regarding the dropping of items. The feasibility of finding clusters in the data was done with the data reduction function of SPSS. Using principal component analysis with varimax rotation, 11 components were extracted from the pretest data, which demonstrated the clustering of data. This clustering demonstrated to the researcher that items were factorable. No items were dropped at this time.

*Phase 3: Psychometric Testing*

This phase consisted of administering the newly developed 33-item intuition instrument to a sample of senior nursing students in order to evaluate construct validity and reliability. The intended sample and the procedure for collection of data will be described in the following sections. A description of the sample, the response rate, and the statistical findings used to evaluate construct validity and reliability will be discussed in Chapter 4.

*Sample.* The National Student Nurse Association (NSNA) provided a randomized list of students by nursing program and by year of graduation. A random sample of 1,000 senior nursing students consisting of 500 senior bachelor's of science in nursing (BSN) students and 500 second year associate degree students(AD) was used. Randomization was performed by using the right hand digit of the NSNA membership number. The BSN program and AD program are the main education pathways for becoming a registered nurse. Nursing students from both types of programs were included in order to (a) diversify the sample, (b) increase variety of experience among students, and (c) represent the

majority of nursing students in the NSNA. Senior nursing students in both nursing programs would have completed at least one year of clinical coursework involving direct patient care and would be 18 years of age or older.

In order to rent the list of names, the researcher had to provide written evidence of dissertation committee approval and the human subjects approval to the Director of the NSNA. Appendix D outlined these requirements. The list of randomized names was rented for a fee from a private agency after the Director of the NSNA granted permission.

The desired sample size was 330. To assess factorial validity in psychometric testing, there should be a ratio of 10 respondents for each scale item (Nunnally, 1978). Stevens (1996) recommend 2-20 responses per item or variable. Tabachnick and Fidell (2001) considered a sample of 300 to be good and "as a general rule a sample of 300 is comfortable for factor analysis" (p. 588).

*Procedure.* Approval was obtained from the University of San Diego Committee on Protection for Human Subjects to conduct the instrument development and psychometric testing. Approval for the study is found in Appendix E. Data collection was done through the United States Postal System and involved two separate mailings.

One thousand intuition instruments were sent to the 500 BSN students and the 500 AD students on the randomly generated list rented from NSNA. A low response rate is an anticipated problem with collecting data through the mail. Gillis and Jackson (2002) listed tips to increase the response rate for a mailed instrument or survey. The suggested tips included (a) identifying the researcher as

the sender on the envelope, (b) making the instrument look professional, (c) sending the material first class with a stamp, (d) enclosing a stamped addressed return envelope (e) following up with a thank you postcard or a reminder, (f) following up with a second letter and copy of instrument 3 weeks later if no response, and (g) sending a third follow up 6-7 weeks later.

Through the U.S. mail, each nursing student received a business size envelope with two copies of the informed consent/introductory letter (Appendix F), a scantron form with demographic questions and the newly developed instrument (Appendix G), and a stamped return addressed envelope. The data collection process involved requesting the students to read and sign one of the informed consent forms, to respond to the demographic questions on side one of the scantron sheet, and to respond to the intuition instrument on side two of the scantron sheet. The completed forms were to be returned in the stamped return addressed envelope.

The business-size envelopes sent to the students had a return address label, which identified the researcher as a doctoral student. The demographic questions and the intuition instrument were placed on a scantron sheet to provide a professional appearance (Appendix G). A stamped addressed envelope was also provided to insure a return of the completed instrument. The first mailing of 1,000 instruments was sent by presorted first class mail. A computer program generated the labels for this mailing. The program allowed the postal clerk to update the addresses supplied by NSNA via Internet access prior to generating the address labels for the mailing. The computer program printed the name and address for

each student directly on the business-size envelope. The 1,000 addressed envelopes were presorted by zip codes and presented to the post office in eight large mail trays.

Three weeks (21 days) after the first mailing, 1,000 postcard reminders/thank-yous were sent out to all the students included in the initial mailing. This postcard thanked those that had already responded and served as a reminder to those who had not responded. A second mailing of 510 instruments was done approximately 2 weeks after the postcard reminders were sent. The second mailing included names of students from the initial mailing that had not responded.

Estimated time for completion of instrument was approximately 10-15 minutes and this time requirement was noted in the informed consent/introductory letter. The data was collected over 2 months, from May 3, 2002 to July 1, 2002. During the data collection time frame, there was an increase in the first class postage stamp from 34 cents to 37 cents. This increase took place on June 29, 2002. The second mailing took place before the 37 cents stamps were available to be placed on the enclosed stamped return envelope. Because the 34 cent first class stamp was placed on the return envelopes, June 29, 2002 marked a logical end for data collection. Several responses were received after this date, because students placed additional postage on the stamped return addressed envelope. A possible complication of the increase in postage is the loss of responses because additional postage was not added to the envelope.

Informed consent was incorporated into an introductory letter. The introductory letter informed the students of the (a) purpose of the study, (b) voluntary nature of their participation, (c) confidentiality of the responses, (d) use of grouped data for publication, (e) risks and/or benefits of their participation, and (f) freedom to withdraw from the study at any time. The letter also stated that the student needed to be 18 years of age or older in order to participate in the study.

There were no apparent risks to the students who completed the instrument. A considered risk was the possibility of the student believing that the instrument was measuring nursing skills. A student may have felt inadequate if he or she did not understand the items in the instrument. The introductory letter/consent stated the purpose of the instrument to prevent this assumption.

Confidentiality was maintained by assigning a code number to each student. The code number was placed on the instrument instead of the student's name. The scantron form had a section marked "ID #" in the upper left hand corner where the code number was placed by the researcher (Appendix G). Two copies of the introductory letter/consent form were sent to each student along with the intuition instrument. One copy was to be signed and returned with the completed intuition instrument and the other copy was to be retained by the student. The consent forms were marked in the upper left hand corner with "Return with Scantron Form" and "Student's Copy" to decrease confusion for the student. As noted in the consent form, all data and confidential information related to the study will be shredded five years after the study is completed.

The scantron forms were coded prior to mailing the instruments to the students. A master list of names was created by the computerized bulk mailing program, Envelope Manager. Student names were organized by city, state, and zip code. Each student was given a code number that was documented on this list. The return of the instruments was monitored by matching the code number on the scantron sheet to the name on the list. The name was highlighted when a response was received. At this time, the consent form was separated from the scantron sheet and the code sheet. The code number was used to identify the respondent because it was difficult to read the signed consent forms. The majority of the signatures were illegible. All data related to the study was stored in a locked file cabinet in the researcher's office. The scantron sheets and the consent forms were stored in separate file drawers and the list of names and code numbers was also stored separately in a locked file drawer.

An incentive was used to increase the response rate. The first mailing offered a raffle ticket for a $150 gift certificate from Southwest Airlines. The nursing student had to fill out the enclosed raffle ticket and return with the completed scantron sheet and consent form. The returned raffle ticket was placed in a basket. A manual drawing of the ticket took place five weeks after the first mailing. The date for the drawing, June 7, 2002, was included in the introductory/consent letter. A colleague of the researcher drew the winning ticket. The winner of the gift certificate was notified by phone and email. The student who won the raffle lived in a city not serviced by Southwest Airlines, so a gift certificate from American Airlines was sent to the student through the U.S. mail.

A second mailing of 510 instruments was sent to non-respondents. A new code was used to track responses and a first class stamp was used to send envelopes rather than the use of first class presorted mail. The incentive for the second mailing was a $50 gift certificate from Amazon. Com. The date for the second drawing, June 22, 2002, was included in the introductory/consent letter (Appendix H). A colleague of the researcher drew the winning raffle ticket. The winner was notified by phone and email and received the gift certificate electronically. Only two mailing were necessary for the data collection process. The researcher received 349 responses by mail, which exceeded the desired sample size of 330.

*Data analysis.* SPSS Version 10.1 was used for all of the data analysis. The researcher performed data entry. After the data was entered from each individual scantron form, the researcher double-checked each entry before entering the data from the next scantron sheet. Missing data were handled by using the exclude listwise function in SPSS.

Descriptive statistics in the form of frequencies and percentages were computed to describe the characteristics of the sample and items in the intuition instrument. Principal component factor analysis was used to evaluate the construct validity of the new scale. The use of an exploratory method of factor analysis permits item groupings and patterns of factors to emerge rather than directing analysis to find a specific pattern (DeVellis, 1991). It is more reassuring to the researcher if the anticipated factors result on their own, rather than being forced (DeVellis, 1991). The Cronbach's alpha (alpha coefficient) was used to

test internal consistency for the intuition instrument and for each factor that emerged in the factor analysis.

Principal component analysis exacts the maximum variance from a data set for each component while the varimax orthogonal rotation minimizes the number of variables with high loadings on a given component, thus simplifying interpretation (Tabachnick & Fidell, 2001). The criteria for extraction of factors included using (a) eigenvalues of 1.00 or above because they provide the total variance explained by each factor (Burns & Glove, 2001), and (b) Cattell's scree test, which provided visual guidance in determining the number of factors or components to extract. Other considerations for extraction included (a) salient loadings, (b) simple structure instead of factorial complexity, and (c) conceptual consistency and interpretability.

*Summary*

Instrument development took place in three phases (a) concept clarification, (b) item development, and (c) psychometric testing. Intuition was defined as a nonlinear process of knowing that is perceived through physical awareness, emotional awareness, and /or through connections at the physical or spiritual level. A conceptual framework was designed to illustrate the relationship between the three identified dimensions of intuition.

Development of the instrument involved creating items for each dimensions of intuition and establishing content validity. Pretesting of the new instrument was done with a sample of 20 senior nursing students resulting in minimal changes. The newly developed intuition instrument was mailed to a

random sample of 1,000 senior nursing students who were members of the National Student Nurse Association. Two mailings resulted in 349 responses (35% response rate). Psychometric testing included (a) descriptive statistics to describe the sample and scale items, (b) principal component factor analysis with varimax rotation, and (c) estimation of reliability by determining the Cronbach's alpha coefficient. The findings are described in Chapter 4.

# CHAPTER 4

# RESEARCH FINDINGS

This chapter will describe the sample, the response rate, and the statistical findings of this study. In addition, the construct validity and reliability of the newly developed intuition instrument will be discussed.

## *Description of Sample*

Of the 1,000 randomly selected members of the NSNA who were sent the newly developed instrument, 349 (35%) completed and returned them. Table 4.1 summarizes the demographic characteristics of this sample. The sample was predominantly between the age of 21-25 (47%), female (89.1%), Caucasian (75.6%), and enrolled in a BSN nursing program (55%). The age of the sample ranged from 19 to 60 years of age. Fifty–four percent of the students had experience as a nursing assistant and 8% had experience as a LPN or LVN. Slightly over ninety-two percent of the students considered themselves to be spiritual persons and 80% percent participated in a religious group. Nearly 72% were Christian.

Table 4.1

*Demographic Characteristics of Study Sample (N=349)*

| Characteristic | N | % |
|---|---|---|
| Age | | |
| 18-20 | 11 | 3.2 |
| 21-25 | 165 | 47.2 |
| 26-30 | 62 | 17.9 |
| 31-35 | 30 | 8.5 |
| 36-40 | 24 | 6.8 |
| 41-45 | 18 | 5.1 |
| 46-50 | 13 | 3.7 |
| 51-55 | 6 | 1.8 |
| 56-60 | 4 | 1.2 |
| No response | 16 | 4.6 |
| Gender: | | |
| Female | 311 | 89.1 |
| Male | 34 | 9.7 |
| No response | 5 | 1.1 |
| Ethnicity: | | |
| Caucasian | 264 | 75.6 |
| African-American | 24 | 6.9 |
| Hispanic | 19 | 5.4 |
| Asian/Pacific Islander | 16 | 4.6 |
| American Indian | 6 | 1.7 |
| Other | 9 | 2.6 |
| No response | 11 | 3.2 |
| Type of Nursing Program | | |
| BSN | 192 | 55 |
| AD | 133 | 38.1 |
| LVN | 1 | 0.3 |
| No response | 23 | 6.6 |
| Worked as NA: | | |
| Yes | 190 | 54.4 |
| No | 158 | 45.3 |
| No response | 1 | 0.3 |

| | | |
|---|---|---|
| Years as NA: | | |
| 0-1 year | 82 | 23.5 |
| 1-2 years | 49 | 14 |
| 2-4 years | 31 | 8.9 |
| over 4 years | 30 | 8.6 |
| Not applicable | 157 | 45 |
| Worked as LVN: | | |
| Yes | 28 | 8 |
| No | 321 | 92 |
| Years as LVN: | | |
| 0-1 year | 4 | 1.1 |
| 1-2 years | 5 | 1.4 |
| 2-4 years | 5 | 1.4 |
| over 4 years | 12 | 3.4 |
| Not applicable | 323 | 92.6 |
| Spiritual | | |
| Yes | 322 | 92.3 |
| No | 27 | 7.7 |
| Participate in Religious Group: | | |
| Yes | 281 | 80.5 |
| No | 68 | 19.5 |
| Type of Religious Group | | |
| Christian | 251 | 71.9 |
| Hindu | 1 | 0.3 |
| Jewish | 2 | 0.6 |
| LDS | 10 | 2.9 |
| Muslim | 0 | 0.0 |
| Other | 19 | 5.4 |
| No response | 66 | 18.9 |

Using the NSNA membership as a sample source increased the geographic diversity of the sample. Responses came from 43 states, which included Alaska and Hawaii. The states with highest response rates included Texas with 35

responses (10% of sample), Florida with 34 responses (9.7%), California with 23 responses (6.5%), Georgia with 19 responses (5.4%), Iowa with 16 responses (4.5%), and New York with 14 responses (4%). Factors that may account for the higher number of responses from these states as compared to the other states include (a) an increased membership in the NSNA from these states and (b) students from these states benefiting from the incentive of a gift certificate from Southwest Airlines. Nursing students from seven states were not included in the NSNA sample. Responses from Arkansas, Maine, Massachusetts, New Hampshire, New Mexico, Rhode Island, and Washington, DC were not obtained.

The randomized sample was reflective of the NSNA membership (personal correspondence with Susan Wong, July 3, 2002). The membership is predominantly female (92.9%), Caucasian (51%), and between the ages of 18-28 (79%). The membership of the NSNA is 37.42% associate degree students, 52.19% baccalaureate students, and 7.88% diploma students. Diploma students were not included in this sample because they represent a small percentage of nursing students. Without specific demographic information on the sample included in the randomized mailing list, a basic assumption that can be made about the non-respondents is that the students lacked interest or belief in the topic of intuition or simply lacked the time or inclination to complete it.

*Response Rate for Mailings*

Two mailings yielded a response rate of 35% (N=349) from the sample of 1,000 nursing students. A response rate of 30% to 60% is realistic for most mailed questionnaires (Dillman, 1978). The response rate for the first mailing of

1,000 instruments was 28% with 288 responses returned by day 37. Day 1 (May 3, 2002) was the day the instruments were mailed out. The first returned instruments arrived on day 6. The majority of the responses were received between day 8 and day 18. The maximum number of responses was received on day 11 (68 envelopes). Nine envelopes with the intuition instrument were returned from the first mailing because of an incorrect address.

The postcard reminder/thank yous were sent out on day 21 because the responses had decreased at this time. Approximately 26 responses arrived after the mailing of the postcard. The second mailing of 510 instruments occurred on day 33 (June 4, 2002). The response rate for this mailing was 12%, with 61 responses being returned. The majority of the responses were returned between days 7 and 14. The maximum response was received on day 7 (11 envelopes). Ten instruments were returned for incorrect addresses, which could be attributed to the fact that many students may have changed residence during the summer months. The researcher was able to determine if an instrument was from first mailing or second mailing by the incentive raffle ticket that was returned and the code on the scantron sheet.

### *Statistical Analysis*

The purpose of this study was the development of a valid and reliable intuition instrument to be used by nursing students. The statistical analysis included (a) examining the frequencies and percentages for all data and means and standard deviations for interval items; (b) establishing the initial internal reliability of the 33-item intuition instrument; (c) establishing the initial reliability

of the three dimensions of intuition; (d) evaluating the construct validity of the 33-item instrument; and (e) establishing the internal reliability for the revised 25-item intuition instrument. The following sections will outline the statistical procedures and rationale used.

*Descriptive Statistics*

The frequency, percentage, mean, and standard deviation for each of the 33 items in the scale were examined by SPSS. The response choices included (1) never, (2) rarely, (3) sometimes, (4) often, and (5) always. The minimum score was (1) for a response of never and the maximum score was (5) for a response of always. Although 349 responses were received, only 336 were used when the exclude case listwise function was used for missing data. Table 4.2 summarizes the statistics for the 33 items, including the range of scores, the mean, and the standard deviation for each item.

The responses for most of the items ranged from never (1) to always (5), and the histograms for the frequency of responses showed a normal distribution curve with few exceptions. Items #3, #15, #18, and #33 did not have a normal distribution of responses among the five choices. It is desirable to have item means close to the center of the range of possible scores (DeVellis, 1991). Items that have a mean that is near the extremes of the response choices tend to correlate poorly with other items. Items that had means near the extremes included item #15 with a mean of 4.7 and item #23 with a mean of 1.9. The alpha coefficient is the most important indicator of scale's quality but examining the

means of the scale items and the variances is a useful double-check (DeVellis, 1991).

Table 4.2

*Descriptive Statistics for Scale Items*

| Item: | Range of Scores | M | SD |
|---|---|---|---|
| 1 | 1 – 5 | 3.6 | .76 |
| 2 | 1 – 5 | 3.3 | .82 |
| 3 | 2 – 5 | 3.9 | .58 |
| 4 | 1 – 5 | 3.4 | .89 |
| 5 | 1 – 5 | 3.1 | .78 |
| 6 | 1 – 5 | 3.3 | .92 |
| 7 | 1 – 5 | 3.2 | 1.1 |
| 8 | 1 – 5 | 3.5 | .69 |
| 9 | 1 – 5 | 2.8 | .96 |
| 10 | 1 – 5 | 3.7 | .95 |
| 11 | 1 – 5 | 3.3 | .76 |
| 12 | 1 – 5 | 2.1 | .79 |
| 13 | 1 – 5 | 2.4 | 1.0 |
| 14 | 1 – 5 | 2.4 | 1.1 |
| 15 | 3 – 5 | 4.7 | .51 |
| 16 | 1 – 5 | 2.9 | 1.1 |
| 17 | 1 – 5 | 2.8 | .94 |
| 18 | 2 – 5 | 4.1 | .70 |
| 19 | 1 – 5 | 2.5 | 1.1 |
| 20 | 1 – 5 | 2.8 | .86 |
| 21 | 1 – 5 | 3.9 | .85 |
| 22 | 1 – 5 | 2.2 | .96 |
| 23 | 1 – 5 | 1.9 | .80 |
| 24 | 1 – 5 | 3.1 | .89 |
| 25 | 1 – 5 | 2.2 | 1.1 |
| 26 | 1 – 5 | 4.1 | .72 |
| 27 | 1 – 5 | 3.0 | .96 |
| 28 | 1 – 5 | 3.3 | .99 |
| 29 | 1 – 5 | 3.1 | .82 |
| 30 | 1 – 5 | 4.1 | .82 |
| 31 | 1 – 5 | 3.2 | 1.0 |
| 32 | 1 – 5 | 4.2 | .77 |
| 33 | 2 – 5 | 4.2 | .69 |

*Initial Reliability of the 33-Item Intuition Instrument*

Internal consistency reliability, which examines the homogeneity of the items in a given scale, is measured by the Cronbach's alpha coefficient (DeVellis, 1991). The alpha coefficient is an important indicator of a scale's reliability because it provides an indication of the proportion of variance in the scale scores that is attributable to the true score (DeVellis, 1994). Reliability is expressed in the form of a correlation coefficient. A 1.00 indicates a perfect reliability whereas .00 means there is no reliability. An alpha of .70 is considered acceptable for a newly developed instrument (Burns & Glove, 2001).

The Cronbach's alpha was used to test the reliability of the initial 33-item intuition instrument and to test the reliability of the three dimensions that the new scale was created to measure. Determining the internal consistency of the measure involved examining the inter-item correlation means, the corrected item-total correlations, and the alpha if item deleted.

The alpha coefficient for the entire scale was .91. Generally items with low-item total correlations are dropped in order to raise the level of reliability (Mishel, 1989). After examining the corrected item-total correlations and the alpha if item deleted, no items were dropped at this time. The corrected item-total correlations ranged from .2405 (Item #15) to .5914 (Item #19). Shelley (1984) recommended deleting items with correlations lower than .20. This was not necessary. No item was predicted to increase scale reliability if dropped. The decision to not delete items at this time was based on (a) the fact that the items in

this scale related to the different dimensions of intuition (Mishel, 1989) and (b) the reliability was as high as desired (Nunnally, 1978).

The initial reliabilities for each dimension of intuition were also examined. The alpha coefficient for the dimension of emotional awareness was .76, for the dimension of physical awareness it was .86, and for the dimension of making connections it was .82. Examination of the corrected item-total correlations and the alpha if item deleted was also performed for each dimension. For the dimensions of physical awareness and emotional awareness, deletion of items would not increase the alpha. For the dimension of emotional awareness, deletion of item 26 would increase the alpha from .7616 to .7646. This item was not deleted at this time because factor analysis would provide more information for making this decision and the increase in the alpha coefficient was not significant. Table 4.3 summarizes the initial alpha coefficients for the intuition instrument and each dimension.

Table 4.3

*Cronbach's Alpha for the 33-Item Intuition Instrument and Three Dimensions*

| Scale/Dimension | # Items | Alpha |
|---|---|---|
| Intuition Instrument | 33 | .91 |
| Emotional Awareness | 11 | .76 |
| Physical Awareness | 9 | .86 |
| Making Connections | 12 | .82 |

*Construct Validity*

Construct validity for the newly developed intuition instrument was evaluated using principal component factor analysis with orthogonal varimax rotation. Principal component analysis with varimax rotation is recommended for exploratory factor analysis when there are at least 20 variables (Nunnally, 1978). All 33 items in the instrument were subjected to the factor analysis.

The criterion of 10 responses per item for factor analysis was met with the 349 received responses (Nunnally, 1978). Only 336 responses were usable after using the exclude listwise function in SPSS. Another method used to determine sample adequacy is the Kaiser measure of sampling adequacy. It is the ratio of the sum of squared correlations to the sum of squared partial correlations (Tabachnick & Fidell, 2001). Values of this ratio should approach 1 if partial correlations are small and factor analysis is useful for this data. Values over .6 are necessary for factor analysis. The value of .878 was obtained when SPSS performed this function. Thus the data provided by the sample could be computed for factor analysis.

The initial principal component analysis with varimax rotation of the 33-item intuition instrument extracted 7 components, which explained 59.158 % of the cumulative variance. Table 4.4 presents the 7-factor solution for the original 33-item intuition instrument and the commonalities for each item. The eigenvalues, percent of variance, and cumulative percentage for each extracted factor are also included. Only the factor loadings of .50 and above are presented in this table.

Table 4.4

*Seven Factor Solution for Original 33-Item Intuition Instrument*

| **Factor:** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | |
|---|---|---|---|---|---|---|---|---|
| **Item:** | | Factor | Loadings | | | | Commonality | |
| 1 | | | .739 | | | | | .601 |
| 2 | | | .664 | | | | | .597 |
| 3 | | | | .606 | | | | .479 |
| 4 | | | .672 | | | | | .606 |
| 5 | | | .734 | | | | | .629 |
| 6 | | | | | | .809 | | .726 |
| 7 | | | | | | | | .500 |
| 8 | | | | | | | | .493 |
| 9 | | | | | | .755 | | .727 |
| 10 | | | | | .543 | | | .603 |
| 11 | | | | | | | | .491 |
| 12 | | | | | | | .522 | .577 |
| 13 | | | | | | .616 | | .646 |
| 14 | .795 | | | | | | | .705 |
| 15 | | | | | | | | .411 |
| 16 | .682 | | | | | | | .587 |
| 17 | | | | | | | .618 | .605 |
| 18 | | | | .806 | | | | .685 |
| 19 | .806 | | | | | | | .723 |
| 20 | | | | | | | | .536 |
| 21 | | | | | | | | .451 |
| 22 | .667 | | | | | | | .591 |
| 23 | | | | | | | .591 | .515 |
| 24 | | .760 | | | | | | .684 |
| 25 | .637 | | | | | | | .516 |
| 26 | | | | | | | | .373 |
| 27 | | .780 | | | | | | .712 |
| 28 | | | | | | | .549 | .615 |
| 29 | | .724 | | | | | | .631 |
| 30 | | | | | .736 | | | .658 |
| 31 | | .643 | | | | | | .572 |
| 32 | | | | | .668 | | | .602 |
| 33 | | | | .793 | | | | .677 |
| Eigenvalues | 8.799 | 3.061 | 2.140 | 1.659 | 1.519 | 1.210 | 1.136 | |
| % of variance | 26.663 | 9.275 | 6.484 | 5.027 | 4.602 | 3.665 | 3.441 | |
| Cumulative % | 26.663 | 35.938 | 42.422 | 47.449 | 52.051 | 3.441 | 59.158 | |

The criterion for factor loading was set at 0.50. There are no set values for minimal factor loadings but many recommendations are available in the literature. Nunnally (1978) recommended a minimum criterion of .40 and Tabachnick and Fiddell (2001) recommended a loading of .32 or above. Gorsuch (1983) stated that the loading should be high enough to suggest that a relationship exists between the variable and the factor. By using .50 as the minimum factor loading, secondary loading on another factor was decreased for this data set and this simplified the interpretation of the factors.

Commonality is the measure of an item's shared variance (Polit, 1996). It is the amount of variance an item shares with all the other items in the analysis and is equal to the sum of the squared loadings across the factors (Hair, Anderson, Tatham, & Grablowsky, 1979). The size of the commonality is useful when assessing how much variance is accountable by an item in the factor solution. The typical range for commonality estimates is .50 to .80 (Nunnally, 1978). Large commonalities suggest that a large amount of variance has been extracted by the factor solution (Hair et al., 1979). The commonality values for the items in the 33-item scale ranged from .373 to .727 (Table 4.4).

Twenty-six items had a factor loading of .50 or above, with factor loadings ranging from .522 to .806. Items that did not meet the criterion factor loading of .50 were deleted from the intuition instrument in a step-by-step fashion (Items #7, #8, #11, #15, #20, #21, and #26). Principal component factor analysis was done after each item was dropped. The loadings for the items intended to be deleted did not increase each time principal component analysis was performed. An

examination of the dropped items revealed that the item wording was vague and did not capture the essence of the extracted factors. Several of the items double-loaded. Item #10, which had a factor loading of .543, was deleted because it was not consistent with the remaining two items within the factor it loaded on. Table 4.5 lists the items that were deleted from the instrument because of low factor loadings, double loading, vague wording, or because it did not capture the essence of the factor.

Principal component analysis and varimax orthogonal rotation was performed with the remaining 25 items using 338 responses. This statistical procedure also resulted in 7 components as in the original 33-item scale. The scree plot was examined and it also demonstrated 7 components (Figure 4.1). These components accounted for 66.22% of the variance. Table 4.6 summarizes the eigenvalues, percent of variance, and cumulative percentage and presents the factor loadings and commonalities for the remaining 25 items. The items are presented in ascending order by factor loadings for each factor.

Table 4.5

*Items Dropped From the Original 33–Item Instrument and Rationale*

| Items Dropped: | Rationale: |
|---|---|
| #7. My muscles tighten when I think something is wrong with my patient. | -Double factor loadings<br>- Loadings < .50 |
| #8. I get a good feeling about a patient's condition. | -Double factor loading<br>-Loadings < .50 |
| #10. My heart beats fast when I think something is wrong with my patient. | -Did not capture essence of factor |
| #11. I understand my patient even if we do not speak with each other. | -Double factor loadings<br>-Loadings < .50 |
| #15. I have caring feelings for my patient. | -Triple factor loadings<br>-Loadings < .50<br>-Vague wording |
| #20. I feel something will happen before it happens. | -Double loadings<br>-Loadings < .50 |
| #21. I recognize the spirituality of my patients. | -Double loadings<br>-Loadings <. 50<br>-Vague wording |
| #26. I am aware of my patient's feelings. | -Double loadings<br>-Loadings < .50<br>-Vague wording |

*Figure 4.1. Scree Plot for 25-Item Instrument*

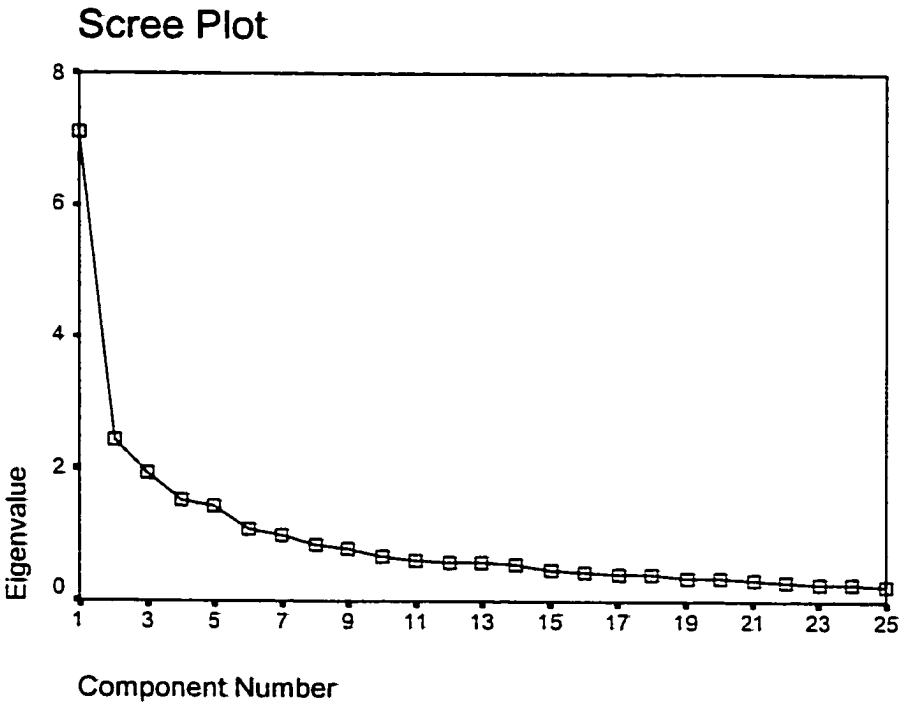


Table 4.6

*Principal Component Analysis with Varimax Rotation For 25-Item Instrument*

| **Factor:** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | Commonality |
|---|---|---|---|---|---|---|---|---|
| | | Factor | Loadings | | | | | |
| **Item:** | | | | | | | | |
| 19 | .827 | | | | | | | .748 |
| 14 | .796 | | | | | | | .715 |
| 16 | .735 | | | | | | | .614 |
| 22 | .670 | | | | | | | .611 |
| 25 | .634 | | | | | | | .542 |
| 1 | | .779 | | | | | | .647 |
| 5 | | .713 | | | | | | .608 |
| 2 | | .706 | | | | | | .628 |
| 4 | | .669 | | | | | | .621 |
| 27 | | | .824 | | | | | .759 |
| 24 | | | .773 | | | | | .690 |
| 29 | | | .743 | | | | | .667 |
| 31 | | | .666 | | | | | .595 |
| 18 | | | | .830 | | | | .737 |
| 33 | | | | .792 | | | | .694 |
| 3 | | | | .669 | | | | .540 |
| 6 | | | | | .799 | | | .715 |
| 9 | | | | | .769 | | | .750 |
| 13 | | | | | .669 | | | .668 |
| 23 | | | | | | .631 | | .534 |
| 17 | | | | | | .628 | | .627 |
| 28 | | | | | | .589 | | .614 |
| 12 | | | | | | .534 | | .602 |
| 30 | | | | | | | .858 | .828 |
| 32 | | | | | | | .838 | .803 |
| Eigenvalues | 7.104 | 2.442 | 1.934 | 1.539 | 1.444 | 1.085 | 1.010 | |
| % of variance | 28.415 | 9.767 | 7.735 | 6.155 | 5.774 | 4.338 | 4.039 | |
| Cummulative % | 28.415 | 38.182 | 45.917 | 52.072 | 57.847 | 62.185 | 66.224 | |

The 25 items included in the principal component analysis loaded on one of 7 factors. The loadings ranged form .534 to .858 in the rotated component matrix. Rotation converged in 6 iterations. The number of items per factor or component ranged from 2- 5 items. Each factor was labeled to describe the items that loaded on it. Factor 1 was labeled as physical sensations; Factor 2 as premonitions; Factor 3 as spiritual connections; Factor 4 as reading of cues; Factor 5 as sensing energy; Factor 6 as apprehension; and Factor 7 as reassuring feelings. Table 4.7 lists the items for each factor and the loading. Commonalities for the 25-item scale the values ranged from .532 to .828 (Table 4.6).

Because this analysis was of an exploratory nature, a minimum number of items loading on a factor was not established prior to the analysis. Nunnally (1978) recommended having at least two variables to estimate a factor. Factor 7 had only two items. The loadings for these items were over .838. There are several reasons this factor was retained. If one item loads on a factor then the factor is poorly defined, yet if two items load on a factor it is important to determine if the two items highly correlate with each other (Tabachnick & Fidell, 2001). The reliability coefficient of the two items was .80. These items related to feeling of calmness and peacefulness and did not correlate with other items in the instrument. Further item development and statistical analysis is necessary before a decision to delete Factor 7 is made.

Table 4.7

*Items for Seven Factors and Factor Loadings*

| Item | Factor Loading |
|---|---|
| **Factor 1: Physical Sensations** | |
| 19. I get a shiver down my spine when I think something is wrong with my patient. | .827 |
| 14. The hair on my arms and neck stand up when something I wrong with my patient. | .796 |
| 16. I get a lump in my throat when something is wrong with my patient. | .735 |
| 22. I feel cold when something is wrong with my patient. | .670 |
| 25. I feel nauseous when something is wrong. | .634 |
| **Factor 2: Premonitions** | |
| 1. I experience a gut reaction when something is wrong with my patient. | .779 |
| 5. I get a bad feeling about a patient's condition. | .713 |
| 2. I get a persistent feeling about a patient's condition. | .706 |
| 4. I get a sinking feeling in my stomach when something is about to go wrong. | .669 |
| **Factor 3: Spiritual Connections** | |
| 27.I connect with my patients at the soul level | .824 |
| 24.I sense a spiritual connection with my patients. | .773 |
| 29. I experience a deep connection with my patients. | .743 |
| 31. I do not need verbal communication to sense a spiritual connection with my patient. | .666 |
| **Factor 4: Reading Cues** | |
| 18. I read the non-verbal body language of my patient. | .830 |
| 33. I read non-verbal cues of my patient. | .792 |
| 3. I can read my patient's expressions. | .669 |
| **Factor 5: Sensing Energy** | |
| 6. I sense positive energy coming from my patient. | .799 |
| 9. I sense negative energy coming from my patient. | .769 |
| 13. I sense an energy field around my patient. | .669 |
| **Factor 6: Apprehension** | |
| 23. I experience a feeling of dread when caring for my patient. | .631 |
| 17. I get a nagging feeling abut a patient's condition. | .628 |
| 28. I feel anxious when I think something will go wrong. | .589 |
| 12. I get an odd feeling about a patient's condition. | .543 |
| **Factor 7: Reassuring Feelings** | |
| 30. I get a calm feeling when I know things will be okay. | .858 |
| 32. I get a peaceful feeling when I know my patient is stable. | .838 |

Theoretically, 3 factors were expected. Instead 7 factors emerged and added depth to the 3 original intuition dimensions. Exploring the underlying relationships among the scale items is vital to the instrument development. While the percentage of variance explained by Factors 6 and 7 is low, 4.3 % and 4% respectively, the notion of delineating emotional awareness into feelings of apprehension (Factor 6) and feelings of reassurance (Factor 7) is important to explore. As a result of the exploratory factor analysis, the 33-item intuition instrument was reduced to 25 items. The revised 25-item intuition instrument can be viewed in Appendix I.

*Reliability of the 25-Item Intuition Instrument*

The findings from principal component analysis with varimax rotation resulted in the deletion of 8 items. SPSS was used to measure the alpha for the 25-item scale and for each of the 7 factors. The Cronbach's alpha for the 25-item scale was .89, which is an acceptable value. No item was predicted to increase the alpha more than .01, if the item was deleted. The corrected item-total correlations ranged from .2520 (Item #33) to .5957 (Item # 19). Again, no item was deleted based on this analysis.

The reliabilities of the items for each factor were also calculated. The alpha coefficients were as follows: .84 for Factor 1, .79 for Factor 2, .82 for Factor 3, .73 for Factor 4, .71 for Factor 5, .69 for factor 6, and .80 for Factor 7. Thus the alpha coefficients for the 7 factors ranged from .69 for Factor 6. to .84 for Factor 1. The lowest reliability was for Factor 6. This reliability was considered acceptable because (a) the instrument is still in the initial stages of

development and (b) the items in this factor are reflective of the findings in the literature. Table 4.8 provides a summary of the alpha coefficients for the 25-item intuition scale and for each factor.

Table 4.8

*Final Cronbach's Alpha for Intuition Instrument and Seven Factors*

| Scale/Factor | # Items | Alpha |
|---|---|---|
| Intuition Instrument | 25 | .89 |
| Factor 1 | 5 | .84 |
| Factor 2 | 4 | .79 |
| Factor 3 | 4 | .82 |
| Factor 4 | 3 | .73 |
| Factor 5 | 3 | .71 |
| Factor 6 | 4 | .69 |
| Factor 7 | 2 | .80 |

Various guidelines and rules of thumb exist for acceptable reliability coefficients (Nunnally, 1967, 1978; Pedhazur & Schmelkin, 1991). For a measure in the early stages of construct development, an alpha of .50 or .60 is satisfactory (Nunnally, 1967) but the value of .70 was later suggested as an acceptable value for a new scale (Nunnally, 1978). Understanding the purpose of the instrument, the stage of development, and the amount of error that the researcher is willing to tolerate was a suggestion provided by Pedhazur and Schmelkin (1991). The alpha values for this scale and each factor were accepted as satisfactory because this instrument is in the early stages of development.

*Summary*

The intuition instrument developed by the researcher to measure the use of intuition by nursing students underwent construct validity and reliability testing. In order to access a large sample of nursing students, the instrument was sent to 1,000 randomly selected members of the National Student Nurse Association. Two mailings were necessary to elicit the desired response rate from the sample. The final count for returned instruments was 349, a 35% response rate.

Principal component factor with varimax rotation, used to evaluate the construct validity of the initial 33-item intuition instrument, yielded 7 factors that explained 59.2% of the variance. The criterion for factor loadings was set at .50, which resulted in the deletion of 8 items. Principal component analysis with varimax orthogonal rotation was repeated with the 25-item instrument and it also elicited 7 factors: Factor 1, physical sensations; Factor 2, premonitions, Factor 3, spiritual connections; Factor 4, reading of cues; Factor 5, sensing energy; Factor 6, apprehension; and Factor 7, reassuring feelings. These seven factors explained 66.2% of the variance. The Crombach's alpha was .89 for the revised 25-item intuition instrument. The reliabilities of the items in the seven factors ranged from .69 to .84. A discussion of the validity and reliability findings, limitations, and implications for further research will be addressed in Chapter 5.

# CHAPTER 5

# DISCUSSION

The purpose of this study was to develop and psychometrically evaluate an intuition instrument designed specifically for the nursing student. This process involved clarifying and defining intuition and developing and psychometrically testing the newly developed instrument. The instrument was tested in a sample of 349 senior nursing students from AD and BSN nursing programs. This chapter will discuss (a) the results of the psychometric testing, (b) a revision of the conceptual framework, (c) the limitations of the instrument developed, and (d) the implications for future research.

## *Results of Psychometric Testing*

Construct validity was evaluated using principal component factor analysis with varimax orthogonal rotation. The seven factors that emerged supported the concept definition of intuition. Intuition was defined and conceptualized as a nonlinear process of knowing that is perceived through physical and emotional awareness and/or through connections at the physical or spiritual level. The seven factors represent the three dimensions of intuition: Factor 1, physical sensations, denotes the dimension of physical awareness;

Factor 2, premonitions, Factor 6, apprehension, and Factor 7, reassuring feelings, reflect the dimension of emotional awareness; and Factor 3, spiritual connections, Factor 4, reading of cues, and Factor 5, sensing energy, represent the dimension of making connections.

Each of the seven factors is consistent with the findings from the classic intuition studies found in the discipline of nursing (Agan, 1987; Leners, 1992; Rew, 1988a, 1988b; Pyles & Stern, 1983; Schraeder & Fischer, 1987; Young, 1987) as well as with the recent studies that explored the use of intuition by experienced nurses (Hansten, 2000; King & Clark, 2002; Ling & Lucker, 2000) Items in Factor 1 represent the physical sensations and gut feelings that experienced nurses (Kelly, 1994; Pyles & Stern, 1983), midwives (Davis-Floyd & Davis, 1996), and business managers (Isenberg, 1984; Khatri & Ng, 2000) verbalized in the qualitative studies. The various types of feeling described in the nursing literature are represented by Factors 2, 6, and 7. Practicing nurses cited reassuring or encouraging feelings (Hansten, 200; King & Clark, 2002), feeling that predict or forewarn (Rew, 1988a, 1988b), and feelings of anxiety, unease, or fear (King & Clark, 2002; Rew, 1988a, 1988b) when describing intuitive experiences.

Experienced nurses (Leners, 1992), midwives (Davis-Floyd & Davis, 1996), and holistic nurses (Agan, 1987) described spiritual connections associated with intuitive experiences, which are represented by the items in Factor 3. Reading patient cues was identified as a personal factor that facilitated intuition use (Schraeder & Fischer, 1987). Items in Factor 4 represent the reading of patient

cues. Finally the notion of sensing energy, which was described by nurses, is represented by Factor 5 (Agan, 1987; Leners, 1992).

The most important finding for the profession of nursing is that a sample composed of senior nursing students, who are not experienced practitioners demonstrated the dimensions of intuition. This finding supports the conceptual definition and the use of intuition by the student and novice.

*Revision of the Conceptual Framework*

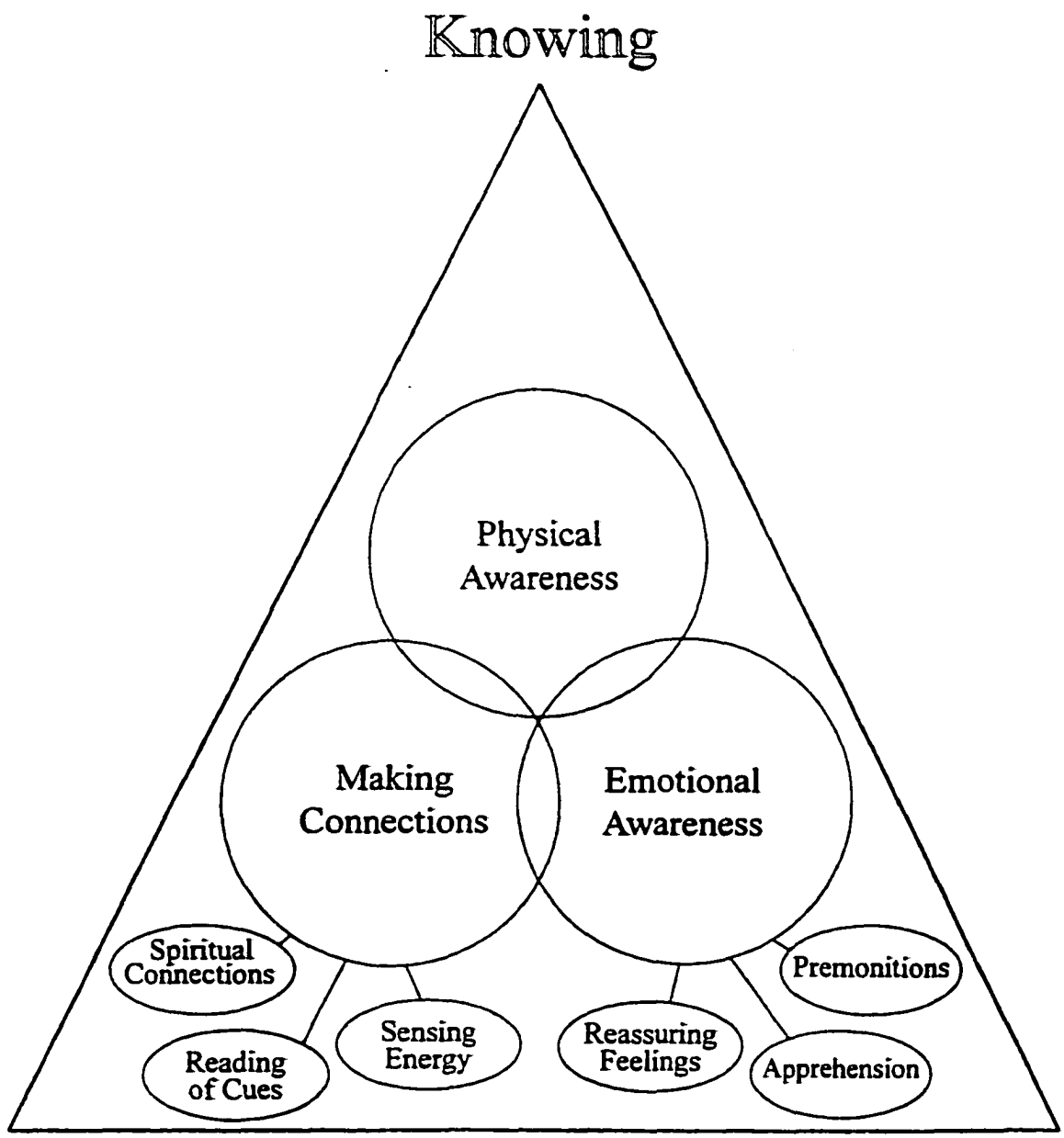
The initial conceptual framework, which stemmed from the definition of intuition as a nonlinear way of knowing, included three dimensions of intuition. The dimensions of emotional awareness, physical awareness, and the making of connections at the physical and spiritual level were configured into three overlapping circles, where the overlapping of the circles represented knowing. Findings from the psychometric analysis suggested that the conceptual framework, which was a visual schema of the concept definition, was too general. The seven factors that emerged provided greater depth and clarity for the concept of intuition. Physical awareness in the form of physical sensations remained a distinct dimension. However, emotional awareness embodied three distinct sub-dimensions: premonitions, apprehension, and reassuring feelings. In a like manner, making connections included spiritual connections, reading of cues, and sensing energy.

The framework was revised to incorporate the 7 factors. Figure 5.1 illustrates the revised conceptual framework that still conceptualizes and defines intuition as a knowing. Physical sensations, premonitions, apprehension,

reassuring feelings, spiritual connections, reading of cues, and sensing energy are all sources of knowledge that can be used when care is provided to patients either by the nursing student or experienced nurse.

This revised framework serves as a springboard for further validation of the instrument and eventually the testing of a theory related to intuition use by nursing students. Exploratory factor analysis is considered a theory generating procedure because it assists in determining the number of factors in the conceptual underpinnings of a concept (Stevens, 1996). The initial conceptual framework only delineated three dimensions or factors that explained intuition use. Use of principal component factor analysis (PCA) demonstrated that there are more factors involved. Further testing of the revised intuition measure with PCA is necessary to create a solid conceptual framework. When a strong theory is established with a strong empirical base, confirmatory factor analysis (CFA) will be used to test the theory (Stevens, 1996).

*Figure 5.1. Revised Conceptual Framework*



### *Limitations of the Instrument Developed*

A discussion of the limitations encountered in the development and testing of the intuition instrument is an important step when examining the results of the study. The limitations identified are associated with the (a) item development and establishment of content validity, (b) data collection process, and (c) sample used for analysis.

#### *Item Development and Testing of Content Validity*

Principal component factor analysis extracted 7 factors from the 33-item instrument. An examination of the items representing each factor demonstrated inconsistencies in the wording of the items. Some items dealt with the condition of the patient, while the majority of the items dealt with "when something is wrong with my patient". Only one item had the stem of "when I think something is wrong with my patient". The intent and focus of the researcher was to capture intuition as verbalized by experienced nurses in the published qualitative studies. For future item development and revision, attention to the wording of the items is recommended. The use of common stems in the item pool would provide consistency in the conditions where intuition use is described. In addition, this consistency in the wording of the items would simplify the task of interpreting the factors.

Another issue noted after factor analysis was the tone of the items. For example, of the 12 items generated for the dimension of emotional awareness, eight items were of impending, ominous, and foreboding feelings and only two items were of feelings that elicited a peacefulness or calmness (Table 3.5). All the

items relating to physical sensations addressed sensations that occur only when something is wrong with the patient (Table 3.5). Future item development should involve generating equal numbers of items, which balance feelings and activities.

A related concern or limitation that deals directly with the items was the choice of content experts. The seven experts used for testing content validity had many years of experience in a nursing specialty and had worked with nursing students. The researcher wanted to include these experts because of their diverse experiences with intuition in various settings. The experts were provided an explanation on how intuition was conceptualized and defined for the purpose of this instrument development.

Grant and Davis (1997) recommended clinical expertise among content experts. They also made the recommendation that the content experts be chosen from those that have published or presented on the topic of interest. The selected experts had diverse clinical experiences and were familiar with the concept of intuition yet had not published on the topic. An advantage of using experts that have researched and published articles related to intuition is that they are familiar with how samples of nurses have verbalized intuition. For future content testing of items, efforts to locate and enlist the help of experts who have published articles related to intuition should be made. This type of expertise may prevent the inconsistency in the wording of items.

*Data Collection Process*

The data collection process involved mailing the intuition instrument via the U.S. postal system to the nursing student and having the completed instrument

returned in an enclosed stamped addressed envelope. Baker (1985) described the process of mailing questionnaires as a valuable data collection technique because it allows large amounts of data to be collected at a low cost. Mailing the intuition instrument to a randomized sample of nursing students provided access to a sample of students with geographically diverse backgrounds and who attended different nursing programs throughout the United States.

While there are advantages and conveniences with mailing an instrument, there are a few limitations related to this method of data collection. Contrary to Baker (1985), Woolley (1984) described the use of mailed questionnaires as lacking in validity because of poor response rates and the biased sample that returns the questionnaire. A poor response rate and having a sample of convenience are identified limitations related to this data collection process.

Limitations for this mailing that may have influenced the response rate included (a) the type and timing of mailing, (b) the increase in the first class postage stamp from 34 cents to 37 cents, and (c) interest or belief in the concept of intuition. A possible limitation was that the initial mailing of the 1,000 instruments was done through presorted first class mail. The use of a computerized program that updated the addresses and sorted the letters by zip codes was chosen over using a first class stamp. Presorting the envelopes should theoretically facilitate the mailing of letters, but a possible result could have been the trays of envelopes being left unattended.

Another limitation was the timing of the mailing. The first 1,000 instruments were sent the first week in May. This month is the traditional month

for graduation and when many graduating students are moving away from college or home for their first job. It was thought that many responses might have been delayed due to forwarding of mail. Also, the last semester of a nursing program is hectic with studying for finals and preparing for the nursing boards. It is recommended that the mailing of instruments to senior nursing students be done early in the semester when students may have more time to complete the instrument.

The intent of the researcher was that the mailings of the instruments occur in the month of March. Mailing the instruments in May was unavoidable for this researcher because of time requirements related to human subjects approvals and pretesting. The anticipated increase of the stamp from 34 cents to 37 cents, which took place on June 29, 2002, was another factor considered. Responses may have not reached the researcher because additional postage was not placed on the return envelope. The goal was to have the required responses for analysis by this date. An earlier date for mailing the instruments may have prevented a conflict with finals, graduation ceremonies, and the change in the postal rate. Finally the lack of interest or belief in the concept of intuition may have been a factor contributing to the response rate.

*Sample*

The sample of students that returned the instrument was a self-selected sample. The sample consisted of senior nursing students randomly selected from the membership list from the National Student Nurse Association. The mailing of the instruments was to a random sample, yet the returned responses may represent

a self-selected sample. While it may be a self-selected sample, it was not geographically limited. It is a sample that is of a national makeup, with responses from 43 states and from many nursing programs throughout the states.

An issue that surfaced with the sample used to test this intuition instrument is that the sample was predominantly young, Christian, and female despite the randomization of names on the mailing list. This is reflective of the NSNA membership but may not be representative of all nursing students found in the United States. In the future, efforts should be made to obtain a stratified random sample. A sample that has more males and diversity in ethnicity and religious participation is needed to test the revised intuition instrument.

Obtaining a large sample of students to test a newly developed instrument can be challenging, especially if the students are under the age of 18. Most nursing student are 18 years of age or older but access to an academic setting requires approval either from a Human Subjects Protection Committee or the responsible governing body on campus. Going through the appropriate approval committee on each campus can be overwhelming if the goal is a sample of 1,000 students or more. Purchasing a mailing list provided a convenient and logical alternative for accessing a large, random sample of nursing students.

The ability to design the make up of a sample is available by using a large computerized mailing list, which can be purchased. Future testing of the revised intuition instrument will involve locating a sample of nursing students stratified for diversity. Purchasing a computerized mailing list offers some valuable options

for the researcher. The researcher can specify the make up of the sample whether by gender, age, ethnicity, or by geographic region.

*Implications for Future Research and Knowledge Development*

The exploratory nature of this study provides the stimulus for more studies related to (a) additional item development and psychometric testing of the revised intuition instrument and (b) development of a nursing theory that focuses on the use of intuition among nursing students. A discussion of the psychometric findings demonstrates the need for further item development and psychometric testing of the revised intuition instrument. Higher level statistical analysis would also strengthen the conceptual underpinnings for the intuition instrument and contribute to theory development.

The need for the development of additional scale items corresponds to the (a) percentage of variance explained by Factor 6 and Factor 7, (b) alpha coefficient for the items contained in Factor 6, and (c) the number of items in Factor 7. Factor 6 and Factor 7 have eigenvalues that just met the cutoff value of 1.00, which was the predetermined value for analysis. They each explained less than 5% of the variance. The alpha coefficient for the four items in Factor 6 was .69, which is an acceptable value for a newly developed instrument (Nunnally, 1967). Finally, Factor 7 contains only two items, but the factor loadings are above .83 and the reliability of the two items is .80. Because this is an instrument in the early stages of development, the notion of potential factors was valued over the activity of deleting items because of low variance or low reliabilities.

Tabachnick and Fidell (2001) noted that the last few factors may represent interesting findings and in this case, Factor 6 and Factor 7 suggest that the dimension of emotional awareness encompasses opposing feelings: apprehensive feelings and reassuring feelings. Additional analysis is necessary to clarify the three factors that are related to feelings (Factors 2, 6, and 7). The primary concern relates to the items in Factor 2, premonitions, and Factor 6, apprehension, which are very similar. Developing additional items that relate to feelings of premonitions, forewarning, and apprehension is necessary for defining and labeling these feelings. Clarification and delineation of the items that relate to feelings is necessary for concept clarity.

With no established intuition instruments developed specifically for nursing students or developed to specifically measure the identified dimensions, it is difficult to compare or contrast the finding of this study with another intuition instrument. The testing of criterion validity was not done at this stage because there are no intuition instruments that have been tested in samples of nursing students and no instruments that have measured intuition as a way of knowing. This instrument is unique from the available nursing intuition instruments (Himaya, 1991; Miller, 1993; Rew, 2000) in that it is measuring (a) the physical and emotional sensations experienced by the nurse, (b) the connections made between a nurse and patient at the physical and spiritual level, and (c) the sensing of energy or energy fields. The available intuition instruments, primarily developed for experienced nurses, have measured intuition as a component of complex decision-making (Himaya, 1991; Rew, 2000).

The only plausible intuition instrument that could be used to test the criterion validity of the new intuition instrument would be Himaya's Intuition Semantic Scale (HINTS) (Himaya, 1991). The scale items found in HINTS do not imply clinical experience or autonomy in nursing practice, which is found in the other available nursing intuition measures (Miller, 1993; Rew, 2002). This instrument needs to be tested in samples of nursing students before it can be used to test the criterion validity of this newly developed intuition instrument.

A significant finding of this study was the demonstration of intuition use by the nursing student. The factors that emerged from the statistical analysis demonstrated that nursing students use/or experience intuition in a similar fashion as the experienced nurses interviewed in the qualitative nursing studies (Agan, 1987; Leners, 1992, Pyles & Stern, 1983; Schraeder & Fisher, 1987; Rew, 1988a, 1988b; Young, 1987). The intention of the researcher is that knowledge gained from future testing of this intuition instrument will assist the nursing student in identifying feelings, connections, or sensations that are encountered while providing patient care. A method of scoring the instrument will be established once the validity and reliability testing are completed. A scoring system that delineates the factors will allow students to determine where their strengths and preference for knowing are.

Exploratory factor analysis is used for theory development and confirmatory factor analysis is used to test the theory (Grimm & Yarnold, 1995). The delay of using confirmatory factor analysis (CFA) relates to the need to clarify several of the factors. Delineation of the feelings experienced during

intuition use is essential and needs to be done prior to the use of CFA. Also, intuition is a complex and abstract concept that is controversial in some scholarly circles. A cautious and statistically sound approach to developing a theory of nursing intuition and testing this theory with confirmatory factor analysis is vital to the profession of nursing.

Additional higher level statistical analysis such as confirmatory factor analysis of the newly developed instrument will contribute to the development and testing of a theory describing intuition use among nursing students. This process of tool development serves as an initial step in the development of an intuition theory because the development of this instrument required the clarification and conceptualization of intuition. Developing and testing a nursing theory related to intuition use among nursing students would be a monumental step in legitimizing intuition use among all nursing professionals. More importantly, examining how and whether nursing students use intuition, should be considered and fostered in the academic and clinical setting.

*Summary*

The purpose of this study was to develop and psychometrically evaluate an instrument that measures the use of intuition by nursing students. A discussion of the psychometric findings, the limitations, and the implications for future research and knowledge development demonstrates the significance of these early findings. The most significant finding of this study focuses on the evidence that nursing students experience the emotions, physical sensations, and connections related to intuition that have been verbalized by experienced nurses.

Efforts were made to minimize the limitations in this study but unavoidable ones were explicated. Recommendations for future testing of the newly developed intuition instrument are made and include (a) consistency in the wording of the items or the use of a stem, (b) use of content experts who have published on the topic of intuition, (c) mailing the instruments earlier in a semester to avoid conflict with exams and graduation, and (d) use of a stratified random sample.

The validity and reliability findings for the newly developed intuition instrument are acceptable at this stage of instrument development. The seven factors that resulted from the principal component exploratory factor analysis with varimax orthogonal rotation are supportive of the concept definition and add more clarity and depth to conceptual framework. Future psychometric analysis of the revised 25-item intuition instrument is needed to clarify the seven factors. Confirmatory factor analysis is an essential follow up once the factors have been clarified. The development of a valid and reliable intuition instrument specifically for nursing students will (a) demonstrate and measure intuition use by students and (b) enable the longitudinal measurement of intuition.

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# APPENDICES

Appendix A

**Measuring the Use of Intuition by Nursing Students**

**Testing the Content Validity**

The purpose of this scale is to measure the use of intuition by nursing students who have completed at least one year of clinical course work involving direct patient care.

Three dimensions of intuition have been identified in the literature. They are (a) emotional awareness, (b) physical awareness, and (c) making connections. Each of these dimensions is defined prior to the developed scale items.

**Instructional Note:**

1. Please determine the validity of each item. This requires assessing the content and relevancy of each item and judging whether it is an appropriate measure of the specified dimension. Please circle the number that best describes the item: (1) not valid, (2) somewhat valid, (3) quite valid, or (4) very valid.

2. Please judge whether the item adequately represents the content of the dimension. Focus on the content of the item and how it represents the dimension and circle the yes or no in this column.

3. Please add comments and suggestions to improve the clarity of the items. Please comment on whether items are appropriate for senior nursing students.

**Please complete the following information:**

Name:_____

Nursing Specialty:_____

Years of Nursing Experience:_____

**Dimension: Physical Awareness:**

Awareness or knowing that comes through the body, the five senses, or physical sensations.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. I experience a gut reaction when something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 2. A voice alerts me to problems that my patient may experience. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 3. I get a funny sensation in my stomach when something is about to go wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 4. My muscles tighten when I think something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 5. My heart beats fast when I think something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 6. I visualize patient outcomes before they happen. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 7. My chest gets tight when something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 8.The hair on my arms and neck stand up when something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9. I get a lump in my throat when I think something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 10. I get a shiver down my spine when something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 11. I get goose bumps (or goose pimples) when I think something is wrong. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 12. A thought alerts me to a patient problem. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 13. I foresee patient problems. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 14. I get a warm feeling throughout my body, when I am sure my patient is okay. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 15. I feel cold when something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 16. I feel nauseous when something is wrong with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 17. A voice tells me there are problems with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 18. I see patient problems before they happen. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |

**Dimension: Emotional Awareness**

Awareness or knowing that comes through feelings or through a caring understanding.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. I get a persistent feeling about a patient's condition. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 2. I get a bad feeling about a patient's condition. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 3. I get a good feeling about a patient's condition. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 4. I get an odd feeling about a patient's condition. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 5. I feel fearful about a patient's condition. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 6. I have caring feelings for my patients. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 7. I get a nagging feeling about a patient's condition. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 8. I feel something will happen before it happens. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 9. I experience good feelings when caring for my patients. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 10. My feelings influence how I care for my patients. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |

| | | | | | | |
|---|---|---|---|---|---|---|
| 11. I experience ominous feelings when caring for a patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 12. I feel my patient's pain. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 13. I reflect on my feelings when providing patient care. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 14. My feelings are helpful when I do my nursing assessment. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 15. I am aware of my patient's feelings. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 16. I feel anxious when I think something will go wrong. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 17. I get a calm feeling when I know things will be okay. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 18. I get a peaceful feeling when I know my patient is stable. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |

**Dimension: Making Connections**

The sensing of relationships on a physical or spiritual level. Physical connections or relationships take place between two people. This type of connecting fosters or permits an understanding of body language or nonverbal communications. Spiritual connections emphasize the universal and spiritual connectedness of humans and the sensing of energy or energy fields.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. I sense a physical connection with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 2. I can read my patient's expressions. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 3. I sense a physical connection with my patient during my nursing assessment. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 4. I sense positive energy coming from my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 5. I sense negative energy coming from my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 6. I sense an energy field around my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 7. I understand my patient even if we do not speak to each other. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 8. I read the nonverbal language of my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 9. I believe that there is a universal connection among people. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10. I recognize the spirituality of my patients. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 11. I sense a spiritual connection with my patients. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 12. I connect with my patients at the soul level. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 13. I experience a deep connection with my patients. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 14. I recognize when my patient is not doing well. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 15. I understand my patient at a spiritual level. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 16. I understand my patient's responses. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 17. I do not need verbal communication to sense a spiritual connection with my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 18. I read the nonverbal cues of my patient. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 19. I recognize a problem by looking at my patient's face. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |
| 20. I believe that there is a spiritual connection among people over time. | 1 Not Valid | 2 Somewhat Valid | 3 Quite Valid | 4 Very Valid | Represents Dimension **Yes / No** | Comments |

# Appendix B

## Content Validity Ratings For the Intuition Dimensions

*Content Validity Ratings for the Dimension of Emotional Awareness*

| Item for Dimension of Emotional Awareness: | Rated by Number of Experts as Very Valid or Quite Valid | Accepted as Valid CVI for the Item * | Retained in Final Instrument |
|---|---|---|---|
| 1. I get a persistent feeling about a patient's condition. | 7 of 7 | Yes 1.00 | Yes |
| 2. I get a bad feeling about a patient's condition. | 6 of 7 | Yes .86 | Yes |
| 3. I get a good feeling about a patient's condition. | 6 of 7 | Yes .86 | Yes |
| 4. I get an odd feeling about a patient's condition. | 6 of 7 | Yes .86 | Yes |
| 5. I feel fearful about a patient's condition. | 5 of 7 | Yes .71 | No |
| 6. I have caring feelings for my patients. | 6 of 7 | Yes .86 | Yes |
| 7. I get a nagging feeling about a patient's condition. | 6 of 7 | Yes .86 | Yes |
| 8. I feel something will happen before it happens. | 6 of 7 | Yes .86 | Yes |
| 9. I experience good feelings when caring for my patients. | 4 of 7 | No .57 | No |
| 10. My feelings influence how I care for my patients. | 5 of 7 | Yes .71 | No |
| 11. I experience ominous feelings when caring for a patient. | 7 of 7 | Yes 1.00 | Yes |
| 12. I feel my patient's pain. | 4 of 7 | No .57 | No |
| 13. I reflect on my feelings when providing patient care. | 4 of 7 | No .57 | No |
| 14. My feelings are helpful when I do my nursing assessment. | 5 of 7 | Yes .71 | No |
| 15. I am aware of my patient's feelings. | 6 of 7 | Yes .86 | Yes |
| 16. I feel anxious when I think something will go wrong. | 6 of 7 | Yes .86 | Yes |
| 17. I get a calm feeling when I know things will be okay. | 6 of 7 | Yes .86 | Yes |
| 18. I get a peaceful feeling when I know my patient is stable. | 7 of 7 | Yes 1.00 | Yes |

* 15 out 18 items rated as valid. CVI for dimension is .83

*Content Validity Ratings For the Dimensions of Physical Awareness*

| Items for Dimension of Physical Awareness: | Number of Experts that Rated as Very Valid or Quite Valid | Accepted as Valid CVI for item * | Retained in Final Instrument |
|---|---|---|---|
| 1. I experience a gut reaction when something is wrong with my patient. | 6 of 7 | Yes .86 | Yes |
| 2. A voice alerts me to problems that my patient may experience. | 2 of 6 | No .29 | No |
| 3. I get a funny sensation in my stomach when something is about to go wrong with my patient. | 6 of 7 | Yes .86 | Yes Funny sensation changed to sinking feeling |
| 4. My muscles tighten when I think something is wrong with my patient. | 6 of 7 | Yes .86 | Yes |
| 5. My heart beats fast when I think something is wrong with my patient. | 7 of 7 | Yes 1.00 | Yes |
| 6. I visualize patient outcomes before they happen. | 6 of 7 | Yes .86 | No, based on comments made by experts |
| 7. My chest gets tight when something is wrong with my patient. | 5 of 7 | Yes .71 | No |
| 8.The hair on my arms and neck stand up when something is wrong with my patient. | 7 of 7 | Yes 1.00 | Yes |
| 9. I get a lump in my throat when I think something is wrong with my patient. | 6 of 7 | Yes .86 | Yes |
| 10. I get a shiver down my spine when something is wrong with my patient. | 7 of 7 | Yes 1.00 | Yes |
| 11. I get goose bumps (or goose pimples) when I think something is wrong. | 7 of 7 | Yes 1.00 | No Same as #8 |
| 12. A thought alerts me to a patient problem. | 5 of 7 | Yes .71 | No |
| 13. I foresee patient problems. | 4 of 6 | No .67 | No Not clear |
| 14. I get a warm feeling throughout my body, when I am sure my patient is okay. | 5 of 7 | Yes .71 | No |
| 15. I feel cold when something is wrong with my patient. | 7 of 7 | Yes 1.00 | Yes |
| 16. I feel nauseous when something is wrong with my patient. | 7 of 7 | Yes 1.00 | Yes |
| 17. A voice tells me there are problems with my patient. | 3 of 6 | No .43 | No |
| 18. I see patient problems before they happen. | 3 out 6 | No .43 | No |

*14 items out of 18 rated as valid. CVI for this dimension is .78

*Content Validity Ratings for the Dimension of Making Connections*

| Items for the Dimension of Making Connections: | Number of Experts that Rated as Very Valid or Quite Valid | Accepted as Valid CVI for Item* | Retained in Final Instrument |
|---|---|---|---|
| 1. I sense a physical connection with my patient. | 5 of 7 | Yes .71 | No |
| 2. I can read my patient's expressions. | 7 of 7 | Yes 1.00 | Yes |
| 3. I sense a physical connection with my patient during my nursing assessment. | 5 of 7 | Yes .71 | No |
| 4. I sense positive energy coming from my patient. | 7 of 7 | Yes 1.00 | Yes |
| 5. I sense negative energy coming from my patient. | 7 of 7 | Yes 1.00 | Yes |
| 6. I sense an energy field around my patient. | 6 of 7 | Yes .86 | Yes |
| 7. I understand my patient even if we do not speak to each other. | 6 of 7 | Yes .86 | Yes |
| 8. I read the nonverbal language of my patient. | 7 of 7 | Yes 1.00 | Yes |
| 9. I believe that there is a universal connection among people. | 4 of 7 | No .57 | No |
| 10. I recognize the spirituality of my patients. | 7 of 7 | Yes 1.00 | Yes |
| 11. I sense a spiritual connection with my patients. | 7 of 7 | Yes 1.00 | Yes |
| 12. I connect with my patients at the soul level. | 6 of 7 | Yes .86 | Yes |
| 13. I experience a deep connection with my patients. | 7 of 7 | Yes 1.00 | Yes |
| 14. I recognize when my patient is not doing well. | 4 of 7 | No .57 | No |
| 15. I understand my patient at a spiritual level. | 5 of 7 | Yes .71 | No |
| 16. I understand my patient's responses. | 4 of 7 | No .57 | No |
| 17. I do not need verbal communication to sense a spiritual connection with my patient. | 6 of 7 | Yes .86 | Yes |
| 18. I read the nonverbal cues of my patient. | 6 of 7 | Yes .86 | Yes |
| 19. I recognize a problem by looking at my patient's face. | 4 of 7 | No .57 | No |
| 20. I believe that there is a spiritual connection among people over time. | 4 of 7 | No .57 | No |

* 15 of 20 items rated as valid. CVI for dimension is .75

Appendix C

## MEASURING THE USE OF INTUITION BY NURSING STUDENTS

INFORMED CONSENT/INTRODUCTION LETTER

Dear Nursing Student,

The purpose of this study is to get feedback on the newly developed intuition instrument. Participation in the study is voluntary. There are no risks involved and you may withdraw from the study at any time. There is no agreement, written or verbal, beyond that expressed in the consent form.

A name is not used or attached to the responses. A code number is used for tracking the packets. The consent forms will be stored separately from the completed instrument and demographic sheet. All data and consent forms will be kept in a locked cabinet in the office of the researcher. The data will be shredded five years after the completion of the study.

Students must be 18 years or older to participate. Participation involves signing the consent (bottom of the page), responding to the demographic information sheet, and completing the newly developed intuition instrument. This should take approximately 15-20 minutes. If you have questions, you can call Anita Smith (the researcher) at (619) 849-2362 or Diana Rodriguez (member of the Human Subjects Committee) at (619) 849.2235. After completing the three enclosed forms, place them in the large manila envelope and return to Anita Smith in Taylor, Room 206. A speedy response is greatly appreciated.

Thank you,

Anita Smith, RN, Ph.D (candidate)

University of San Diego

---

I, the undersigned, understand the above explanations and on that basis, I give consent to my voluntary participation in this research.

_____ _____

Signature of Subject Date

## Measuring the Use of Intuition by Nursing Students

Directions: The purpose of this instrument is to measure the use of intuition by the nursing student, who has had at least one year of course work involving direct patient care. Please choose the response that best applies to the frequency of the following behaviors. You can use a pencil or ballpoint pen to fill in the bubbles.

***If you have a comment or question regarding an item, please write in the comment section.

***Please note the time that you start this instrument and the amount of time it took to complete.

**Time Started:**_____

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. I experience a gut reaction when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 2. I get a persistent feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 3. I can read my patient's expressions. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 4. I get a sinking feeling in my stomach when something is about to go wrong. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 5. I get a bad feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 6. I sense positive energy coming from my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 7. My muscles tighten when I think something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8. I get a good feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 9. I sense negative energy coming from my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 10. My heart beats fast when I think something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 11. I get an odd feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 12. I sense an energy field around my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 13. The hair on my arms and neck stand up when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 14. I have caring feelings for my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 15. I understand my patient even if we do not speak to each other. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 16. I get a lump in my throat when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 17. I get a nagging feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 18. I read the nonverbal body language of my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |

| | | | | | | |
|---|---|---|---|---|---|---|
| 19. I get a shiver down my spine when I think something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 20. I feel something will happen before it happens. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 21. I recognize the spirituality of my patients. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 22. I feel cold when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 23. I experience ominous feelings when caring for a patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 24. I sense a spiritual connection with my patients. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 25. I feel nauseous when something is wrong. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 26. I am aware of my patient's feelings. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 27. I connect with my patients at the soul level. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 28. I feel anxious when I think something will go wrong. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 29. I experience a deep connection with my patients. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 30. I get a calm feeling when I know things will be okay. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |

| | | | | | | |
|---|---|---|---|---|---|---|
| 31. I do not need verbal communication to sense a spiritual connection with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 32. I get a peaceful feeling when I know my patient is stable. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |
| 33. I read the nonverbal cues of my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always | Comments: |

**Time Finished:**_____

How long did it take you to complete reading and signing the consent, completing the demographic sheet, and completing the instrument? _____

**Where the directions clear?** _____

**Please comment on this experience.**_____

Thank you for your time.

Appendix D


NSNA 50th Annual Convention and Alumni Reunion
Pennsylvania Convention Center - Philadelphia, PA
April 3-7, 2002

November 14, 2001

Ms. Anita Smith
2150 Pacific Beach Drive
Apt. 243
San Diego, CA 92109

Dear Ms. Smith:

I am responding to your request to rent the NSNA membership list for the purpose of conducting research for your doctoral dissertation at the University of San Diego. The list will be made available to you at NSNA's cost. However, the list cannot be released until your dissertation proposal has been accepted and approved for human research.

Once these requirements are met, please send me a letter with copies of the approval letters and your specifications for the list (i.e. graduating seniors, random selection, etc.), and I will arrange for you to obtain the labels.

Good luck with your proposal.

Sincerely,

Diane J. Mancino, EdD, RN, CAE
Executive Director

National Student Nurses' Association, Inc.
555 West 57th Street, Suite 1327 • New York, NY 10019 • (212) 581-2211 • Fax (212) 581-2368
e-mail: nsna@nsna.org • www.nsna.org

Appendix F

## MEASURING THE USE OF INTUITION BY NURSING STUDENTS

INFORMED CONSENT/INTRODUCTION LETTER

Dear Nursing Student,

The purpose of this study is to establish the reliability and validity of an instrument developed to measure the use of intuition by nursing students. Participation in the study is voluntary. There are no risks involved and you may withdraw from the study at any time. There is no agreement, written or verbal, beyond that expressed in this letter.

A code number is assigned to each student to maintain confidentiality. The code number is placed on the scantron sheet instead of a student's name. The signed consent will be kept separate from the scantron form. All data and consent forms will be kept in a locked cabinet in the office of the researcher. Data from this study will be analyzed and published only in group form. The scantron sheets and consent forms will be shredded five years after the study is completed.

Students must be 18 years of age or older to participate. Participation involves signing the consent (bottom of the page) and completing the questions on the scantron sheet. This should take approximately 10-15 minutes. For questions, see the contact numbers below. After completing the enclosed forms, place one signed consent form and the completed scantron sheet in the stamped addressed envelope and send through the U.S. mail. The second copy of the consent form is to be kept by the student.

Participation and speedy response is greatly appreciated. **To encourage a timely response and return rate, a raffle ticket for a $150 gift certificate from Southwest Airlines is included.** To be eligible for the raffle please return completed forms and raffle ticket by **June 7, 2002.**

Thank you,


| | **Contact Names and Numbers:** | |
|---|---|---|
| Anita Smith, RN, Ph.D (candidate) | Anita Smith | 619.849.2362 |
| University of San Diego | Dr. Thurkettle | 619.260.4563 |


---

I, the undersigned, understand the above explanations and on that basis, I give consent to my voluntary participation in this research.

_____ _____

Signature of Subject Date

# Measuring the Use of Intuition by Nursing Students

Use a No. 2 Pencil, Blue or Black Ink Only

Correct mark: ⬭ ● ⬭

Appendix G

***Demographics***

1. ID #

2. Age

3. **Gender:** ⬭ Female ⬭ Male

4. **Ethnicity:** ⬭ Caucasian ⬭ African-American
   ⬭ Hispanic ⬭ Asian-American/ Pacific Islander
   ⬭ American Indian ⬭ Other

5. **Type of Nursing Program you are currently enrolled in:**
   ⬭ Bachelor's of Science in Nursing (BSN)
   ⬭ Associate Degree Program (AD)

6. **Have you worked as a Nursing Assistant?**
   ⬭ No
   ⬭ Yes. How many years?
   ⬭ 0-1 year
   ⬭ 1-2 years
   ⬭ 2-4 years
   ⬭ Over 4 years

7. **Have you worked as a Licensed Vocational Nurse (LVN) or as a Licensed Practical Nurse (LPN)?**
   ⬭ No
   ⬭ Yes. How many years?
   ⬭ 0-1 year
   ⬭ 1-2 years
   ⬭ 2-4 years
   ⬭ Over 4 years

8. **Do you consider yourself a spiritual person?**
   ⬭ No
   ⬭ Yes

9. **Do you participate in a religious group.**
   ⬭ No
   ⬭ Yes. Please identify your religious affiliation.
   ⬭ Christian
   ⬭ Hindu
   ⬭ Jewish
   ⬭ Latter Day Saint
   ⬭ Muslim
   ⬭ Other

| | Never | Rarely | Sometimes | Often | Always | |
|---|---|---|---|---|---|---|
| 1. I experience a gut reaction when something is wrong with my patient. | | | | | | |
| 2. I get a persistent feeling about a patient's condition. | | | | | | |
| 3. I can read my patient's expressions. | | | | | | |
| 4. I get a sinking feeling in my stomach when something is about to go wrong. | | | | | | |
| 5. I get a bad feeling about a patient's condition. | | | | | | |
| 6. I sense positive energy coming from my patient. | | | | | | |
| 7. My muscles tighten when I think something is wrong with my patient. | | | | | | |
| 8. I get a good feeling about a patient's condition. | | | | | | |
| 9. I sense negative energy coming from my patient. | | | | | | |
| 0. My heart beats fast when I think something is wrong with my patient. | | | | | | |
| 1. I understand my patient even if we do not speak with each other. | | | | | | |
| 2. I get an odd feeling about a patients condition.. | | | | | | |
| 3. I sense an energy field around my patient. | | | | | | |
| 4. The hair on my arms and neck stand up when something is wrong with my patients. | | | | | | |
| 5. I have caring feeling for my patients. | | | | | | |
| 6. I get a lump in my throat when something is wrong with my patient. | | | | | | |
| 7. I get a nagging feeling about a patient's condition. | | | | | | |
| 8. I read the non-verbal body language of my patient. | | | | | | |
| 9. I get a shiver down my spine when I think something is wrong with my patient. | | | | | | |
| 0. I feel something will happen before it happens. | | | | | | |
| 1. I recognize the spirituality of my patients. | | | | | | |
| 2. I feel cold when something is wrong with my patient. | | | | | | |
| 3. I experience a feeling of dread when caring for my patient. | | | | | | |
| 4. I sense a spiritual connection with my patients. | | | | | | |
| 5. I feel nauseous when something is wrong. | | | | | | |
| 6. I am aware of my patients feelings. | | | | | | |
| 7. I connect with my patients at the soul level. | | | | | | |
| 8. I feel anxious when I think something will go wrong. | | | | | | |
| 9. I experience a deep connection with my patient's. | | | | | | |
| 0. I get a calm feeling when I know things will be okay. | | | | | | |
| 1. I do not need verbal communication to sense a spiritual connection with my patient. | | | | | | |
| 2. I get a peaceful feeling when I know my patient is stable. | | | | | | |
| 3. I read non-verbal cues of my patient. | | | | | | |

Appendix H

## MEASURING THE USE OF INTUITION BY NURSING STUDENTS

### INFORMED CONSENT/INTRODUCTION LETTER

Dear Nursing Student,

If you did not respond to the first mailing, this is a second opportunity to participate. The purpose of this study is to establish the reliability and validity of an instrument developed to measure the use of intuition by nursing students. Participation in the study is voluntary. There are no risks involved and you may withdraw from the study at any time. There is no agreement, written or verbal, beyond that expressed in this letter.

A code number is assigned to each student to maintain confidentiality. The code number is placed on the scantron sheet instead of a student's name. The signed consent will be kept separate from the scantron form. All data and consent forms will be kept in a locked cabinet in the office of the researcher. Data from this study will be analyzed and published only in group form. The scantron sheets and consent forms will be shredded five years after the study is completed.

Students must be 18 years of age or older to participate. Participation involves signing the consent (bottom of the page) and completing the questions on the scantron sheet. This should take approximately 10-15 minutes. For questions, see the contact numbers below. After completing the enclosed forms, place one signed consent form and the completed scantron sheet in the stamped addressed envelope and send through the U.S. mail. The second copy of the consent form is to be kept by the student.

Participation and speedy response is greatly appreciated. **To encourage a timely response and return rate, a raffle ticket for a $50 gift certificate from Amazon.Com is included.** To be eligible for the raffle please return completed forms and raffle ticket by **June 22, 2002.**

Thank you,


| | **Contact Names and Numbers:** | |
|---|---|---|
| Anita Smith, RN, Ph. D (candidate) | Anita Smith | 619.849.2362 |
| University of San Diego | Dr. Thurkettle | 619.260.4563 |


---

I, the undersigned, understand the above explanations and on that basis, I give consent to my voluntary participation in this research.

_____ _____

Signature of Subject Date

Appendix I

## Revised Intuition Instrument

Directions: The purpose of this instrument is to measure the use of intuition by the nursing student, who has had at least one year of course work involving direct patient care. Please choose the response that best reflects the frequency of the following behaviors as they apply to your clinical experiences and life experiences. You can use a pencil or ballpoint pen to fill in the small bubbles (0)

| | | | | | |
|---|---|---|---|---|---|
| 1. I experience a gut reaction when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 2. I get a persistent feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 3. I can read my patient's expressions. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 4. I get a sinking feeling in my stomach when something is about to go wrong. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 5. I get a bad feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 6. I sense positive energy coming from my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 7. I sense negative energy coming from my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 8. I get an odd feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 9. I sense an energy field around my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 10. The hair on my arms and neck stand up when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 11. I get a lump in my throat when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 12. I get a nagging feeling about a patient's condition. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 13. I read the nonverbal body language of my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |

| | | | | | |
|---|---|---|---|---|---|
| 14. I get a shiver down my spine when I think something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 15. I feel cold when something is wrong with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 16. I experience ominous feelings when caring for a patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 17. I sense a spiritual connection with my patients. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 18. I feel nauseous when something is wrong. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 19. I connect with my patients at the soul level. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 20. I feel anxious when I think something will go wrong. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 21. I experience a deep connection with my patients. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 22. I get a calm feeling when I know things will be okay. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 23. I do not need verbal communication to sense a spiritual connection with my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 24. I get a peaceful feeling when I know my patient is stable. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |
| 25. I read the nonverbal cues of my patient. | 0 Never | 0 Rarely | 0 Sometimes | 0 Often | 0 Always |