

CREATIVE THINKING ABILITY OF
WOMEN IN NURSING

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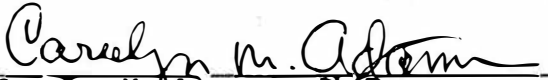
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I am submitting herewith a dissertation written by Patricia L. Richard, M.S.N., entitled "Creative Thinking Ability of Women In Nursing." I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Nursing.



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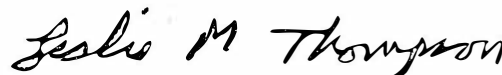


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Dean for Graduate Studies and
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DEDICATION

This dissertation is dedicated to my mother Jo Ann M. Richard who is truly a remarkable and extraordinary woman, and in loving memory of my father James S. Richard, M.D.

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The completion of this dissertation would not have been possible without the assistance and encouragement of many individuals. I am grateful to my family and friends who have kept me going with their support, love and encouragement. To my brothers and sisters, James, Susan, Margaret, Carla, Timothy, Stephen, Regina, Matthew, Thomas, Jo Anne, and Emily, and my mother Jo Ann, thank you for your encouragement, love, and support.

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ABSTRACT

Creative Thinking Ability Of Women In Nursing

By Patricia Richard
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A nonexperimental, descriptive, correlational design was used to determine the level of creative thinking ability of 60, randomly selected, baccalaureate junior and senior female nursing students. The relationship between creative thinking ability, perception of creative thinking ability, self-concept and perceived stress was also explored to assess the amount of variation in creative thinking ability accounted for by each independent variable. Instruments were the Torrance Test of Creative Thinking, Figural form B, the Khatena-Torrance Creative Perception Inventory which included two parts, What Kind of Person Are You? (WKOPAY), and Something About Myself (SAM), the Coopersmith Self-esteem Inventory (SEI), the Perceived Stress Scale (PSS), and a demographic data profile.

Twenty-eight (46.7%) of the subjects scored above the 50th percentile for Creative Thinking Ability ($N = 60$, $\mu = 113.72$, $SD = 13.14$) indicating adequate levels of creative thinking ability compared to the adult female norm ($N = 720$, $\mu = 111.63$, $SD = 16.13$). Subjects had average or above average levels of self-concept ($\mu = 77.86$, $SD = 17.65$) compared to the adult norm ($\mu = 71.7$, $SD = 18.8$), and perceived life as

stressful ($\mu = 22.05$, $SD = 7.38$) as compared to the adult norm ($\mu = 20.20$, $SD = 7.80$). Multiple regression analyses indicated that the SEI ($\mu = 77.86$, $SD = 17.65$) accounted for approximately 9% of the variance of the dependent variable, creative thinking ability (multiple $R = .295$, $R^2 = .087$, $F(1, 60) = 5.539$, $p = .02$). The other independent variables, WKOPAY ($\mu = 26.28$, $SD = 6.21$), SAM ($\mu = 27.6$, $SD = 6.71$), and PSS ($\mu = 22.05$, $SD = 7.37$) were not significant in the multiple regression equation.

The projected technological advances and expanded roles of nurses for the future will make creative thinking ability an important asset for nurses. Therefore, the implications for this study include consideration of activities to integrate and promote creative thinking stimulating activities for students throughout the curriculum. Although the majority of the subjects indicated mid to high levels of self-concept, promotion of positive professional and personal self-concepts in students by the faculty and in the curriculum are indicated. And finally, because of the high levels of stress indicated by the subjects in the study, encouragement of students to seek guidance and counseling in stressful situations is also indicated.

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CHAPTER I

INTRODUCTION

Students in nursing programs today will be the nurses of tomorrow. Soon they will be expected to make sophisticated judgements and nursing diagnoses with a high degree of accuracy that may result in life or death decisions. Their capacity to employ creative thinking abilities gives them an edge in the complicated and multifaceted field of nursing. Creative thinking is a cognitive ability that enables the individual to entertain several ideas or options at a time, eliminating the inappropriate, and retaining the correct option. This ability is crucial to diagnosis and intervention in nursing.

Coping with rapidly changing medical technology, scarce and expensive health-care resources, expansion of health services both in the hospital and the community, and the increasing complexity of patient problems require nurses who can think creatively. This need for creative thinking in nursing has been identified for the diagnosis, intervention and evaluation of patient problems (Kuhn, 1986). Creative thinking impacts the amount of time needed for diagnosis and treatment, and eventually the length of hospital stay or patient illness (Kuhn, 1986; Papper, 1984). The advances in medical technology have led to new and expanded roles in nursing (Jones, 1983; Kramer 1976). These changes have made nursing more challenging and require that the individual

pursuing nursing as a career be able to think creatively (Aichlmayr, 1969; Demetrulias & Shaw, 1985; Jones, 1983; and Sullivan, 1987). For example, creative thinking ability has been identified as an essential skill for carrying out the nursing process (Aichlmayr, 1969; Simms & Lindberg, 1978; and Stepp-Gilbert and Wong, 1985). Both the nursing process and creative thinking involve assessment, consideration of multiple solutions, selection of an appropriate solution, and intervention, followed by evaluation. Other facets of changing roles in nursing that demand creative thinking abilities include promotion of professional collegial relationships (Murphy, 1985; Sullivan, 1987) and development of nursing theory and research (DeGroot, 1988; Kalisch, 1975; Kuhn, 1986; Murphy, 1985; Pesut, 1985).

Personality factors may have an affect on performance, cognitive ability and creative thinking ability of the nurse. These factors include perception of creative thinking ability, self-concept and amount of perceived stress experienced by the individual (Cohen, Kamarck, & Mermelstein, 1983; Khatena, 1981; Phillips, 1973; Purkey, 1970; Rogers, 1959). A nonexperimental descriptive correlational study is needed to determine the level of creative thinking ability of nurses and the affect of these personality factors on creative thinking ability.

Problem of Study

This study was designed to investigate the relationship between the creative thinking ability, perception of creative thinking ability, self-concept and perceived stress of students enrolled in nursing.

Therefore, the problem of this study was to answer the question: What is the relationship between perception of creative thinking ability, self-concept, perceived stress and creative thinking ability of female nursing students?

Rationale for the Problem

The American Association of Colleges of Nursing (AACN) (1986) reported that the diverse demands of present day nursing require individuals with the ability to think creatively. Specifically, the authors of the report stated "the diversity and complexity of nursing practice in today's health care field makes it necessary to prepare nurses who can think critically and creatively and who have a sound education in nursing science, related sciences, and the humanities" (p. 3). These diverse and complex areas of nursing include practice, education, research, and the advancement of nursing science and knowledge. Scarce and expensive resources combined with continuing technological advances make the practice of nursing a management challenge as well (Demetrulias & Shaw, 1985; Kuhn, 1986).

Additionally, the nursing profession needs creative individuals who can solve some of the problems facing nursing today. These problems include the shortage of nurses partially created by nurses leaving nursing for other professions, poor career planning and mobility, and lack of recognition of nursing as a profession (National Association of Nurse Recruiters, 1980; Wintz, 1987). Kuhn (1986) suggested that contributing to the shortage of nurses is the fact that fewer students

are choosing nursing as a career and more students are opting for occupations with greater visibility and recognition as professions. The overall image of nursing as a career was also identified as a factor in student selection of a career outside of nursing.

Along with the shortage of nurses, the cost of health care is a continuing challenge. Timeliness and accuracy of diagnosis and treatment are receiving more and more attention with the rising costs of health care and declining federal funding. Additionally, health care professionals are being challenged by their patients to improve accuracy of diagnosis and treatment. These factors suggest a need for utilization of creative thinking abilities by nurses on a continual basis. The benefits derived from the use of creative thinking are: improved medical management (Stephenson & Bass, 1983); increased resourcefulness in diagnosing difficult patients leading to decreased length of hospital or institutional stay with a reduction in cost to the individual and government (Kuhn, 1986; Papper, 1984); an increased number of nursing professionals interested in research and generation of nursing knowledge (Kuhn, 1986; DeGroot, 1988; Kalisch, 1975; Murphy, 1985; Pesut, 1985); and advancement of professional collegial relationships (Murphy, 1985; Sullivan, 1987).

Perception of ability, self-concept and perception of stress are factors that have been found to influence performance and cognitive ability but not necessarily creative thinking ability (Cohen, Kamarck, & Mermelstein, 1983; Phillips, 1973; Purkey, 1970; Rogers, 1959). Of

these factors, perception of ability has been directly linked to creative thinking ability (Khatena, 1981). These personality characteristics directly influence the ability to perform cognitive activities at any given point in time. Each of these characteristics will be discussed below.

The first factor, perception of ability, has been linked by Rogers (1959), to most aspects of personality development. The performance and self-actualization of the individual are directly influenced by the perception the person has of self and the perception others have of that person. Perception of creative thinking ability has been found to be related to creative thinking ability (Khatena, 1981; Pesut, 1988), individual strengths, the power to perform (physically, emotionally, intellectually and creatively) and self-concept (Sisk, 1972). Khatena (1981) suggested that individuals who accurately view themselves as creative tend to behave in creative ways. A positive relationship between creative thinking behavior and perception of creative ability was identified by Phillips (1973) who determined that college students who are creative also perceive themselves as creative and perform in creative ways. The converse was also found to be true, for example, individuals with low creative thinking behaviors accurately perceived themselves as having low creative thinking abilities.

The second factor that influences cognitive ability is the self-concept of the individual. Self-concept has been linked to performance of cognitive abilities for many years. According to Purkey

(1970), the idea of self "serves to edit all incoming information and to influence our future performance" (p. 23). In addition to the influence that self-concept has on performance, Purkey asserted that a reciprocal relationship between the two variables exists. The individual who has a positive attitude of self tends to perform successfully. Conversely, performing poorly tends to influence the individual's self-concept in a negative manner. In other words, performance is enhanced when the individual has a positive self-concept and likewise, the individual with a poor self-concept is likely to exhibit inferior performance (Sisk, 1972; Purkey, 1970).

Rogers (1959) identified self-concept as influencing the ability of the individual to perform and self-actualize. Rogers indicated that the individual is most likely to participate in creative thinking activities during periods of self-actualization. There is considerable literature acknowledging the link between self-concept and performance of general cognitive abilities (Coopersmith, 1967; Gergen, 1971; Purkey, 1970; Rogers, 1959; Shavelson & Stuart, 1981; Wylie, 1961). However, a link between self-concept and specific creative thinking abilities has not been identified.

The final influencing factor is the perception of stress by the individual. Poor concentration and decreased accuracy of cognitive abilities and possible impairment of future performance result from situations perceived as stressful by the individual (Beck & Srivastava, 1991).

According to Rogers (1961), creative thinking is most successful when one is responsive to inner conditions that promote creative thinking. These inner conditions are "openness to experience", "internal locus of evaluation" with freedom from external evaluation, and ability to "toy with elements and concepts" (p. 354). When the individual is unable to respond to these inner conditions due to internal or external stressors, the ability to self-actualize is repressed. The interference with the drive for self-actualization would indirectly influence the ability to perform creatively.

The challenges facing nursing and the demands of the future led to the question being studied. The results of the study will be relevant to patient care provided by nurses. Creative thinking can: 1) lead to early and accurate identification of patient problems; 2) result in more rapid intervention, decreased recovery time and cost for the patient; and 3) stimulate research interest and collegial relationships among nurses.

Nurses are involved with making sophisticated judgements and nursing diagnoses on a daily basis. The ability of the nurse to make accurate decisions depends on the use of creative thinking to formulate such decisions. Many factors affect the individual's cognitive and creative thinking abilities at any given time. These factors include perception of ability (Khatena, 1981; Pesut, 1988; Phillips, 1973), self-concept (Purkey, 1970; Sisk, 1972), and perception of stress (Beck & Srivastava, 1991; Rogers, 1959). Several researchers have

investigated the encouragement of creative thinking ability in nurses (Eisenman, 1970; Thomas, 1979; Torrance, 1964). However, no agreement among studies of creative thinking ability can be identified, therefore, further study is indicated.

For this study, the dependent variable being investigated is the creative thinking ability of female nursing students. The independent variables are perception of creative thinking ability, self-concept, and perceived stress of the female student nurses. Demographic variables to be collected to describe the sample are age, ethnicity, marital status, and college level (junior or senior), number of full-time college semesters completed, and whether or not the subjects have completed a college degree.

Theoretical Framework

Perception, self-concept and creative thinking are characteristics of the personality, therefore, Rogers' (1959) Theory of Personality (TOP) was selected as the theoretical framework for this study. Developed by Rogers to explain personality development and behavior in humans, this theory formed a basis for studies of inappropriate personality development, behavior, and therapeutic change in personality.

Rogers' theory assumes that a person is an organized whole who has an innate need for self-actualization. Because of this need, goals are directed toward actualization of the organism. Perception of experience is reality for the individual who also perceives the world as having

order. Orderliness in the environment reinforces the perception of experience. The self-concept is defined by the person's perception of experience and interaction with the environment and significant others. Self-concept is reflected in the total self-regard complex which includes "such attitudes as self-satisfaction, self-acceptance, self-esteem, self-favorability, congruence between self and ideal self, and discrepancies between self and ideal self" (Wylie, 1961, p. 127). According to Rogers (1947, 1959), when congruence exists between the ideal self and actual perceived self the self-concept of the individual is heightened. On the other hand, when a disparity exists between the ideal self and actual perceived self the individual experiences a lowered self-concept. The congruence between ideal self and actual perceived self, and the resulting self-concept determine the potential of the individual to successfully self-actualize.

Self-esteem is used to describe the evaluative component of the self-concept or self regard complex (Gergen, 1971; Wylie, 1961). According to Rogers (1959), as a person matures, interaction with the environment shapes and molds the self as a product of experience. Experience is valued within the context of how that experience moves the individual toward the goal of self-actualization. Conditions in the environment can impinge on the ability to regulate and control the self. When these environmental stressors interfere, the person may either exhibit behavioral abnormalities or adapt to the stressor. The behavior of the person changes when views of self change. Behavior change in

response to this internal feedback can be positive or negative. The fully functioning person is said to exist when the individual has reached the point of maximal creativity and self-actualization (Rogers, 1959).

The Theory of Personality (TOP) is part of a collection of four theoretical formulations that are linked together by strong interrelationships and called the Theory of Therapy (TOT). The TOT contains the TOP, the Theory of Interpersonal Relationships (TIR), and the Theory of the Fully Functioning Person (TFFP). Included with the TOT is a collection of fields of human experience and endeavor that Rogers labels Theoretical Implications for Various Human Activities (figure 1).

Rogers' TOP was selected as a framework for this study due to the existing theoretical relationships between the concepts of perception, self-concept, and stress. All of these concepts are linked to self-actualization which, according to Rogers (1959), is a major factor in development of the personality. Of primary interest for this study is creative thinking ability which is an integral activity of the self-actualized individual's personality (Rogers, 1959).

In the TOP, a person moves developmentally from infancy to adulthood. Rogers (1959) viewed each human infant as perceiving any and all experience as reality, thereby perceiving reality in a unique manner. Different aspects of the personality are developed through perception of the reaction of others to the exhibited behavior. It is

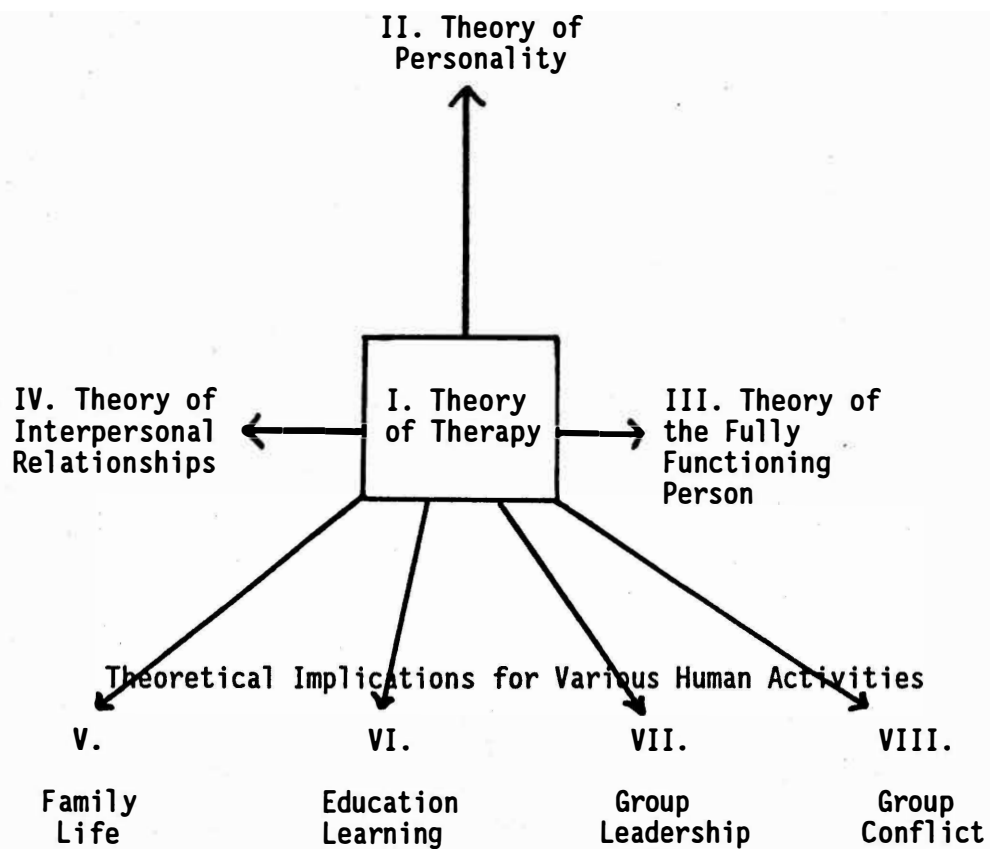


Figure 1. Simplified diagrammatic representation of Rogers' Theory of Therapy, Personality, Interpersonal Relationships and the Fully Functioning Person (1959, p. 193)

through this process that an infant develops a personality. A few of the aspects developed are an internal frame of reference for reality, a self-concept, a need for positive regard, self-regard, and conditions of worth. The total self-regard complex consists of self experiences including the need for positive regard, self-experience, and conditions of worth. In this respect, total self-regard includes the evaluative component of the self-concept which is reflected as self-esteem (Gergen, 1971; Rogers, 1959; Wylie, 1961). All of these aspects of the personality are developed as a part of a goal directed internal tendency toward self-actualization or satisfaction of perceived needs.

According to Rogers (1959), whenever a real or perceived threat is experienced to any aspect of the personality, the threat is perceived as a stressor. When confronted with a task perceived as stressful, attempts to avoid stress are directed at keeping the gap between ideal and actual performance very narrow. When this occurs, there is congruence between the evaluation of the performance and the actual performance. When avoidance is not successful, either a defense mechanism, such as denial, is used or adaptation occurs. Rogers (1961) emphasized qualities of the self-actualized or fully-functioning person to be success in adaptation to stressors, perceptively open to all experiences, and maximally creative.

The tendency toward self-actualization is the dominant stimulus for creativity and the creative thinking process (Rogers, 1961). Self-actualization and the creative thinking process are dynamic

entities that change as a person matures. Components of a personality use a feedback system that assists in the regulation of behavior. A disparity with one aspect of the personality affects other components and self-actualization (Rogers, 1959). For example, if an individual experiences a performance failure, the failure will be perceived as a stressor and have a negative affect on self-concept and perception of ability. The effect on these personality components will in turn alter the ability to self-actualize. A graphic representation of these components and an interpretation of the feedback system is depicted in figure 2.

Rogers (1961) defined the creative process as "the emergence in action of a novel relational product, growing out of the uniqueness of the individual on the one hand, and the materials, events, people, or circumstances of his life on the other" (p. 350). Rogers contended that the individual creates to satisfy a self need in an effort to actualize the being.

In summary, through the TOP, Rogers explained the development of the personality and the influence of perception, self-concept and stress on that development. The motivational factor for the individual is the desire for self-actualization. Creative activities such as creative thinking are most likely to occur when the individual is self-actualized. These personality components share a feedback system that helps regulate the behavior of the individual.

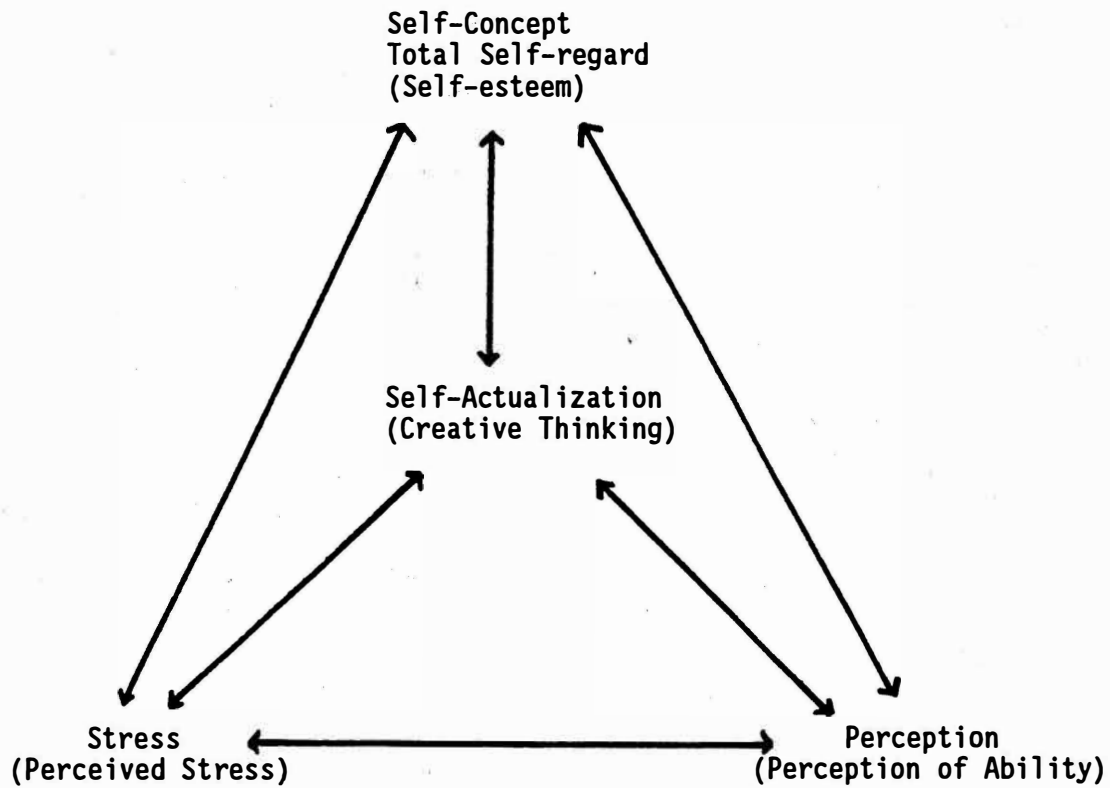


Figure 2. An interpretation of the relationship between Rogers' (1959) concepts: self-concept, perception, stress, and self-actualization.

Assumptions

The following assumptions were generated from Rogers' (1959) Theory of Personality and were used as the foundation for the investigation of creative thinking abilities, perception of creative thinking abilities, self-concept and perceived stress of female nursing students:

1. The perceptions the individual (student) has of self-concept, stress level and creative thinking ability are reality for the individual (student) (Rogers, 1959).
2. Self-concept and creative thinking ability of an individual (student) are influenced by interaction with the internal and external environment (Rogers, 1959).
3. The (creative thinking) ability of an individual (student) is influenced by the perception of (creative thinking) ability (Rogers, 1959).
4. Congruence between the ideal and actual perceived self results in heightened self-concept of the individual (Rogers, 1947, 1959).
5. Disparity between the ideal self and actual perceived self results in a lowered self-concept of the individual (Rogers, 1947, 1959).

Research Questions

The following research questions were proposed for investigation in this study:

1. What is the level of creative thinking ability of female nursing students?
2. What is the relationship between creative thinking ability, and age and number of full-time semesters completed of female nursing students?
3. How much of the variance in creative thinking ability is explained by the perception of creative thinking ability, self-concept, and perceived stress of female nursing students?

Definition of Terms

The following terms were defined for this study:

Creative thinking ability is defined by Torrance (1974) as becoming receptive to: "problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results" (p. 8). Creative thinking ability was operationally defined as the total score obtained on the Torrance Test of Creative Thinking (Figural Form), an instrument designed to measure creative thinking ability (Torrance, 1962).

Perceived stress is the "degree to which situations in one's life are appraised as stressful" (Cohen, Kamarck & Mermelstein, 1983, p. 385). Perceived stress was operationally defined as the score on the

Perceived Stress Scale, an instrument designed to measure an individual's perception of life stressors (Appendix A).

Perception of creative thinking is the personal recognition of creative abilities (Khatena & Torrance, 1976). Perception of creative thinking ability was operationally defined as the cumulative score on the Khatena Torrance Creative Perception Inventory, an instrument designed to measure perception of creative thinking ability (Khatena & Torrance, 1976).

Self-concept, is the perception of self which is generated through interaction with the environment (Rogers, 1959; Shavelson, Hubner & Stanton, 1976). Self-concept was operationally defined as the score on the Coopersmith Self-Esteem Inventory (CSEI) an instrument designed to assess total self-regard or the evaluative component of self-concept (Coopersmith, 1967; Gergen, 1971; Wylie, 1961)..

Limitations

A randomly selected sample of female nursing students, in one geographical area, who agreed to participate in the study was used. Therefore, the findings of the study can only be generalized to the population being studied. Additionally, since there are a variety of differences in the abilities of males and females, specifically the spatial differences, the sample was limited to females (Bock & Kolakowski, 1973; Maccoby & Jacklin, 1974).

Summary

Perception of creative thinking ability, self-concept, perceived stress and creative thinking ability are all facets of the personality and were the focus of this study. More specifically, the study was designed to: determine the level of creative thinking ability of female nursing students; and the relationship between perception of creative thinking ability, self-concept, perceived stress and creative thinking ability of female nursing students. Rogers' (1959) Theory of Personality (TOP) was used as the framework for this study. The theory described the development of the personality from infancy to adulthood and described the role of perception, self-concept, perceived stress and creative thinking ability in personality development.

Subsequent chapters focus on the study designed around the research questions. Chapter Two contains the review of the literature involving the dependent and independent variables, creative thinking ability, perception of ability, self-concept, and perceived stress. Chapter Three focuses on the research methodology used to answer the research questions. Chapter Four presents the results of the study, and finally, Chapter Five discusses the results presented in Chapter Four.

CHAPTER II

REVIEW OF THE LITERATURE

Creative thinking ability is an important element in the quest for self-actualization by an individual. Rogers (1959, 1961) maintained that self-actualization, creative behavior, successful adaptation to stressors, and perceptual openness to all experiences are characteristics of the fully functioning person. The personality components that have an effect on the ability to self-actualize and become maximally creative are perception of ability, self-concept, and perceived stress. A review of the literature is provided to define and discuss the interrelatedness of the variables: creative thinking, perception of ability, self-concept and perceived stress as related to adults over the age of eighteen. Additionally, a review of the research and theoretical literature will provide background for the study.

Creative Thinking

Creative thinking ability refers to a collection of general cognitive talents that are thought to be associated with creative accomplishments (Torrance, 1990). The following theoretical perspective reviews some of the events leading to the current definition and measurement of creative thinking ability. The literature review investigates creative thinking ability in nursing populations.

Theoretical Perspective

Impetus for research on creative behavior was generated by Guilford (1970), president of the American Psychological Association (APA) in 1950 who reported that there were only 165 citations dealing with creativity in Psychological Abstracts prior to 1950. Following his address to the APA, more than 740 books and research articles on creative behavior were published between 1950 and 1965. This surge in research activity helped to clarify and change many of the beliefs of the time. Among the beliefs dispelled were the unchanging nature of the IQ, and the belief that people are either creative or noncreative from birth (Guilford, 1970; Rhodes, 1961).

Researchers interested in creativity continue to be challenged by the lack of a universally accepted definition of the concept (Guilford, 1970). Definitions of creative behavior are nebulous at best and are applied mostly to performance, fine arts and literature. Researchers looked to the writings of Plato and Aristotle to form their own definitions of creativity (Murray, 1959). As a result of this common origin, many of the definitions have similar wordings and characteristics.

For example, Rogers (1961) attempted to clarify the concept by defining the creative process as "the emergence in action of a novel relational product, growing out of the uniqueness of the individual on the one hand, and the materials, events, people, or circumstances of his life on the other" (p. 350). Parnes (1972) defined creative behavior as

"behavior which demonstrates both uniqueness and value in its product. The product may be unique and valuable to a group or organization, to society as a whole, or merely to the individual himself" (p. 193). Parnes further described creativity as a "function of knowledge, imagination, and evaluation" (p. 194).

Torrance (1974) described the cognitive act of creativity or creative thinking as:

a process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results (p. 8).

Guilford (1950) described specific characteristics of a creative individual that included "sensitivity to problems", "fluency" "novel ideas", "flexibility", "synthesizing ability", "analyzing ability", "reorganization or redefinition", "degree of complexity", and "evaluation" (p. 451-453). These characteristics repeatedly surfaced, in some form, in the literature by different authors (Rogers, 1961; Torrance, 1962).

In order to test and strengthen their definitions, researchers developed instruments to measure creativity and creative thinking. Several articles related to original instruments that have since been refined. For example, the Minnesota Test of Creative Thinking (MTOCT)

developed by Torrance (1962) was the precursor to the present Torrance Tests of Creative Thinking (TTCT) (Torrance, 1966 & 1974; Cramond, in press). The MTOCT was a single test which consisted of six tasks which included the Product Improvement Test, Unusual Uses, Circle-Objects Test, and the Ask-And-Guess Test which consists of three parts: sensing gaps in knowledge and asking questions, forming hypotheses about causes, and forming hypotheses about consequences. The MTOCT activities have been revised and divided into the two tests of the TTCT. Creative thinking ability was operationalized in this study as the creativity index score on the TTCT (Torrance, 1974).

The Personal Opinion Survey (POS) is a 30-item, pencil and paper, creative personality measure (Eisenman, 1968). The POS includes five subtests: Tolerance for Complexity, Tolerance for Ambiguity, Scanning, Independence of Judgment, and Regression in the Service of the Ego. Another measure used by Eisenman (1970) was the Unusual Uses Task (UUT) which involved subjects making an exhaustive list of uses for a particular item, for instance, a brick. The UUT was used to test fluency and originality of the responses.

The Torrance Common Problems Test (TCPT) has been used to measure "awareness of possible problems that might arise in connection with certain socially interactive situations" (Bailey, McDonald & Claus, 1970, p. 104). This test required the subject to list all conceivable problems that could arise as a result of five common social situations. Responses were rated as either coercive and manipulative or responsive

and sensitive. Another test developed by Torrance was the Torrance Social Improvements Test (TSIT). This task required the subject to list improvements for five social practices. The responses were then rated on originality of the suggested intervention.

A measure designed specifically for nursing problems was the Bailey General Nursing Problems Test (BGNP). The BGNP was developed to measure original solutions to uncommon nursing problems (Bailey, McDonald & Claus, 1970). To complete the test subjects listed any and all plausible solutions to problems regardless of the uniqueness of the solution.

In summary, the documentation of research efforts concerning the concept of creativity were few prior to 1950. The call for scholarly investigation of the concept by Guilford prompted increased research activity resulting in the development of several definitions upon which research could be based. Of all the definitions evolved over the years Torrance (1974) has been cited most in the literature. Likewise, of all the instruments developed to measure creativity and creative thinking the Torrance Test of Creative Thinking was the most frequently cited.

Creative Thinking In Nursing Education

Creative thinking ability in nursing is necessitated by dramatic changes in the role of nurses during the past few decades. Individuals pursuing nursing as a career must be able to think creatively. According to Aichlmayr (1969), Demetrulias and Shaw (1985), and Sullivan (1987) there is a need for nurses who think creatively to cope with

rapidly changing medical technology, scarce and expensive health-care resources, expansion of health services both in the hospital and the community, and the complexity of both patient and nursing problems. In addition, the promotion of professional collegial relationships, new and expanded roles, and the development of nursing theory and research demand that nurses possess creative thinking abilities.

Stepp-Gilbert and Wong (1985) identified creative thinking as an essential skill for nurses. As an integral part of nursing curriculum, learning the nursing process requires the use of creative thinking. A component of creative thinking is divergent thinking. Divergent thinking is a process by which multiple solutions are considered and then the one most appropriate solution is selected for the situation. According to Guilford (1950, 1959) divergent thinking was thought to contain the most important elements of creative thinking. The process allows the individual "to think in different directions, sometimes searching, sometimes seeking variety" (Guilford, 1962, p. 160). Divergent thinking allows the nurse to consider a variety of alternatives to solving a problem thus producing unique and unusual solutions.

Stepp-Gilbert and Wong (1985) were interested in ways to encourage divergent thinking in a nursing curriculum. In an effort to impress upon students the importance of discharge planning, a course assignment was revised to allow the students to employ divergent thinking concepts to produce a product and solve a patient problem simultaneously. The

students were able to draw upon previous knowledge and different experiences to produce the solution. The project also promoted independence in investigation of multiple approaches to problem resolution and accountability for their own learning. Benefits derived from the experience included student self satisfaction, feelings of accomplishment, autonomy and an appreciation for creative productivity.

The Effect of Nursing Curriculum On Creative Thinking Ability

Torrance (1964) evaluated creative thinking among nursing students enrolled in a three year diploma program. Three groups of students, one group from each academic year from 1959 to 1962 entered the study as freshmen and completed it as seniors (Group A $n = 17$; Group B $n = 23$; Group C $n = 23$). The three year period of study was implemented to determine the effectiveness of the curriculum over time. The instrument used as a pre- and post-test was the Minnesota Test of Creative Thinking (MTOCT) developed by Torrance (1962). Torrance (1964) sought to answer these questions: "does nursing education reduce the creative development of students?" and "does a nursing education program eliminate the most creative students who enter?" (p. 29).

To answer the first question Torrance (1964) reported the results of three groups of students. Group A ($n = 17$) tested significantly higher as seniors ($\mu = 147.9$) than as freshmen ($\mu = 89.9$, $p < .005$) on all six tasks of the MTOCT. At the time that Groups B ($n = 23$) and C ($n = 23$) were evaluated, a revised scoring system was used which grouped the scores into four categories: ideational fluency, flexibility,

originality and elaboration; and a total score. The results of each category were: ideational fluency (Group B Freshman $\mu = 59.4$, Senior $\mu = 97.5$; Group C Freshman $\mu = 55.6$, Senior $\mu = 112.5$); flexibility (Group B Freshman $\mu = 40.0$, Senior $\mu = 49.4$; Group C Freshman $\mu = 33.4$, Senior $\mu = 53.3$); originality (Group B Freshman $\mu = 69.4$, Senior $\mu = 97.5$; Group C Freshman $\mu = 58.6$, Senior $\mu = 100.1$); elaboration (Group B Freshman $\mu = 45.1$, Senior $\mu = 61.4$; Group C Freshman $\mu = 42.7$, Senior $\mu = 67.2$); and total score (Group B Freshman $\mu = 213.9$, Senior $\mu = 305.8$; Group C Freshman $\mu = 190.3$, Senior $\mu = 333.1$). Again, as seniors the groups scored significantly higher than as freshmen ($p < .005$).

Although means for pre- and post-testing for each group were reported, no possible ranges of scores or other statistical values were included.

The second question addressed student retention as a phenomena of concern. Pre-test scores of freshmen students who dropped out of the program were compared with pre-test scores of students who persisted and completed the program (Group A dropouts $n = 17$, persisted $n = 45$; Group B dropouts $n = 22$, persisted $n = 76$; Group C dropouts $n = 17$, persisted $n = 78$). With the exception of flexibility (Group A dropouts $\mu = 13.0$, persisted $\mu = 16.5$; Group B dropouts $\mu = 39.6$, persisted $\mu = 44.0$, $p < .10$; Group C dropouts $\mu = 30.8$, persisted $\mu = 33.5$, $p < .05$), no significant differences were found between those who dropped out and those who persisted in the program when tested as freshmen in 1960 and 1961. Those 1960 freshmen who persisted were found to have a significantly higher flexibility score than those who dropped out ($p <$

.05). Although means for dropouts and graduates for each group were reported, no other statistical values were included.

Torrance (1964) reported that results of the data supported an increase in creative thinking as students continued through the curriculum. In response to the results from the second question Torrance proposed that drop-out students might have been less flexible thinkers than those who completed the program in nursing study.

Eisenman (1970) also focused on the change of creative ability of students during their nursing education but with decidedly different results. The all female sample was selected from two schools of nursing in Philadelphia ($N = 266$). The students were tested during their freshmen, junior and senior levels. Sixty of the total number of students were tested both during their freshmen and senior years to provide a longitudinal sample.

The Unusual Uses Task (UUT) was the measure for creativity that resulted in fluency and originality scores. The Personal Opinion Survey (POS) was also used as a measure of creative personality characteristics. The findings from the two schools were evaluated using t -test at each level of the programs. Due to lack of significant differences between the two schools, the results were combined and evaluated by class level in subsequent tests. Additionally, as a result of a high correlation between fluency and originality for the UUT ($r = .88$), the results for fluency were not analyzed. Eisenman (1970) reported a decline in originality as class level increased for the

cross-sectional sample ($F = 15.25$, $p < .001$). Using t -test to determine the post hoc differences between means, freshmen were found to "have significantly more originality than juniors, who in turn have significantly more originality than seniors" ($t = 5.19$, $p < .01$) (p. 323). Longitudinal findings on the originality variable were found to be similar to the cross-sectional results. The t -test was used to evaluate significant change over the two year period. Freshmen showed a significant decline in originality by the time they became seniors ($t = 5.28$, $p < .001$).

Cross-sectional results of the POS were consistent with the previous test. No significant difference was found between the different levels of students ($F = 1.15$, p not reported). Longitudinal results for the POS were similar to cross-sectional results in that no significant change in opinion occurred during the two year period ($t = 1.62$, p not reported).

Eisenman (1970) suggested that the results of the originality factor of the UUT were possibly related to the conforming and conventional nature of nursing education and the subordinate role of nurses. The insensitivity of the POS may have resulted from student desire to select the "correct" or expected answer rather than personal opinion.

Level Of Professional Training And Creative Thinking Ability

Level of professional training has also been the subject of investigations of creative thinking in nursing. Ventura and Meyers

(1976) compared students from 16 associate, diploma and baccalaureate degree programs in nursing to study creative thinking abilities of nursing students. A convenience sample of volunteers was used to obtain the N of 344 subjects. Due to the use of a convenience sampling technique, the sample sizes were not representative of the available populations (associate $n = 82$, diploma $n = 126$, baccalaureate $n = 127$).

The instrument used was the Torrance Tests of Creative Thinking (TTCT), Form A, both verbal and figural. An analysis of variance (ANOVA) was used to evaluate the results between and among groups. Significant results were reported on the following tasks: Verbal fluency ($F = (3, 332) 5.28, p < .01$); originality ($F = (3, 332) 26.19, p < .01$); figural fluency ($F = (3, 332) 3.06, p < .05$); flexibility ($F = (3, 332) 3.35, p < .05$); and figural elaboration ($F = (3, 332) 9.57, p < .01$). No significant differences between groups were found related to the tasks of verbal flexibility and figural originality. Post hoc pairwise comparisons were performed on the significant results using the Scheffe technique.

Post hoc comparisons of group means for the verbal results indicated diploma students scored significantly higher on verbal fluency ($F = (2, 332) 5.82, p < .01$) than the associate and baccalaureate students, and baccalaureate students scored significantly higher on verbal originality ($F = (2, 332) 26.19, p < .01$) than the associate and diploma students. The figural results indicated diploma students scored higher on figural fluency ($F = (2, 332) 3.06, p < .05$) and flexibility

($F = (2, 332) 3.35, p < .05$). The results of the figural elaboration as determined by the post hoc tests indicated that the associate students scored significantly higher than baccalaureate students (second) and diploma students (third). Results of the post hoc tests were not reported (Ventura & Meyers, 1976; Ventura, 1979).

Results from the study prompted Ventura (1979) to recommend the need for longitudinal study and delineation of characteristics for each group. In addition, Ventura suggested a follow-up study of all groups for the evaluation of creative thinking abilities and performance after graduation in the practice realm. Concluding, Ventura suggested the development, implementation and evaluation of experimental curricula to encourage creative thinking among nursing students.

Sullivan (1987) also investigated creative thinking among students with different levels of educational preparation. The sample involved registered nurses (RN) with preparation at the diploma or associate degree level enrolled in a baccalaureate program of nursing ($n = 51$). The TTCT form A was used to assess nurses' creative thinking abilities upon entry to the program and the equivalent form B was used on completion of the program. Results indicated that the overall creativity index was significantly higher upon entry ($\mu = 114$) to the program than upon exit ($\mu = 107.10$) ($t = .016, p = .016$). When the components of the TTCT were evaluated individually, flexibility was significantly higher at the end of the program ($\mu = 49$) than at the beginning ($\mu = 46$) ($t = 2.15, p = .040$). Originality however, was

significantly lower at the end of the program ($\mu = 65$) than at the beginning ($\mu = 79$) ($t = -2.77$, $p = .009$). The factor of fluency was not significantly altered by the educational experience. Sullivan believed that the results were inconsistent with the goals of baccalaureate education, and that additional learning experience would enhance creative thinking ability. The findings were inconsistent with an earlier study by Sullivan (1984) in which results indicated that graduating registered nurses from a baccalaureate nursing program ($n = 53$) had significantly higher scores ($p < .01$) on the TTCT at graduation than upon entry to the program.

Innovative Approaches in Nursing Curriculum to Foster Creative Thinking

An effort to integrate creative problem solving skills into nursing curricula was implemented at the University of California School of Nursing, San Francisco in the 1950s and 1960s. The goal was to produce graduates with sophisticated creative problem solving abilities while instilling a need to be involved in the cycle of exploring possible alternatives for problem solving from a solid theoretical background (Bailey, McDonald & Harms, 1966; Harms & McDonald, 1966a, 1966b; McDonald & Harms, 1966). After the implementation of the curriculum to stimulate creative problem solving based on the definition by Torrance (1974), an investigation was undertaken to determine its success. The researchers hypothesized a resultant increase in overall general creative ability (Bailey, McDonald & Claus, 1970).

The sample consisted of college women ($N = 141$) from three nursing classes during a six year study period. The groups were deemed to be homogeneous when entering the program based on demographic and personality measures using an analysis of variance (ANOVA) and a t -test. Instruments used in the study were the Torrance Tests of Creative Thinking (TTCT), the Torrance Common Problems Test, The Bailey General Nursing Problems Test and the Torrance Social Improvements Test (Bailey, McDonald & Claus, 1970). For their study Bailey, McDonald and Claus (1970) selected two verbal tasks and two figural tasks, one each from the two TTCT forms. The verbal tasks selected were the Product Improvement Activity and the Unusual Uses Activities. The figural tasks selected were the Incomplete Figures Activities and the Repeated Figures Activity. Each task was evaluated on fluency, flexibility, originality, and elaboration.

Results of the TTCT were generated using ANOVA and t -test procedures. Using the graduating class of 1966 as the control group (C) ($n = 47$) and graduating classes from 1967 (E_1) ($n = 50$) and 1968 (E_2) ($n = 44$) as experimental groups, significant differences appeared in verbal fluency ($F = 46.33$, $p < .005$); flexibility ($F = 51.70$, $p < .005$); originality ($F = 24.60$, $p < .005$); and figural fluency ($F = 3.44$, $p < .025$). Figural flexibility, originality and elaboration were not significantly different. Factor analysis produced two factors: a verbal creativity factor and a figural creativity factor. The two experimental groups E_1 and E_2 were found to be significantly higher on

the verbal factor ($p < .005$) than the control group C and E₂ differed significantly from E₁ on this factor ($p < .001-.0005$). Group C was significantly higher than E₁ on the figural factor ($p < .01$); however, no F values were given for the two factors by the authors.

Based on the findings Bailey, McDonald and Claus (1970) reported that changes in the curriculum were most likely responsible for the positive results of the study. They could not, however, explain the superior performance by the control group with respect to figural creativity and its relationship to nursing decision making. Their conclusion with respect to the creativity measures was that "the experimental curriculum has produced significantly more creative behavior than the curriculum that preceded it" (p. 107) thus supporting the hypothesis.

Thomas (1979) also investigated the effect of a revised curriculum designed to promote "individuality and a problem-solving approach to nursing interventions" on creative ability after graduation (p. 116). Thomas hypothesized that students at varying levels and graduates of the new nursing program would have higher creative thinking measures than those students in the old curriculum. An additional hypothesis negated a relationship between cognitive and creative measures.

Thomas (1979) used the TTCT, verbal form to measure creative thinking. Rather than using all seven tasks in the instrument, Thomas selected three of the seven that focused on divergent thinking characteristics. The three tasks were Unusual Uses, Unusual Questions

and Just Suppose, each of which produced two or more scores for fluency, flexibility, originality, and elaboration.

The population from which the convenience sample was drawn included nursing students from an older established curriculum and the new revised curriculum at the same school of nursing. The groups were designated as Nursing I (pretest $n = 109$), Nursing V (post-test $n = 40$) from the new curriculum and Seniors from the old curriculum (post-test $n = 43$) (Thomas, 1979). Findings enabled rejection of the hypotheses with the beginning students in the new curriculum ($\mu = 57.24$) scoring higher creative strengths than the students completing the new curriculum ($\mu = 45.28$, $t(2, 83) = 2.69$, $p < .05$). Additionally, the students from the old curriculum ($\mu = 56.12$) exhibited higher creative strengths than the students in the new curriculum ($\mu = 48.42$, $t(2, 83) = 2.03$, $p < .05$). Discussion of the results presented an explanation of an inflexible, structured nursing program which stifled students creative ambitions. Two alternate explanations focused on temporal changes in the students and an overall decline in nationwide pre-college testing (SAT and ACT). The relationship between creative and cognitive abilities was vague and required further attention (Thomas, 1979).

In summary, literature regarding creative thinking in nursing was diverse but no synergy existed. Torrance (1964) reported that creative thinking ability increased in response to the nursing curriculum over time while Eisenman (1970) determined that originality declined as class level increased as a result of the curriculum. Eisenman also suggested

that the curriculum may have been responsible for producing conforming and subordinate nurses. Ventura and Meyers (1976) in their investigation of the level of professional training found diploma students scored significantly higher on verbal fluency than associate and baccalaureate students; and baccalaureate students scored significantly higher on the verbal originality factor than the other two groups. Figural results indicated that diploma students scored higher on figural fluency and flexibility than the other two groups; associate degree students scored significantly higher on figural elaboration than diploma and baccalaureate students. Sullivan (1987) determined that flexibility was significantly higher at the end of the program than the beginning for RN students returning for a baccalaureate degree. However, originality was found to be significantly lower at the end of the program than at the beginning.

Curriculum innovations designed to produce nurses with sophisticated creative problem-solving abilities were the focus of Bailey, McDonald, and Claus (1970) who reported positive results suggesting the curriculum was responsible. However, Thomas (1979) found that curriculum innovations did not necessarily produce the desired results. Studies involving nursing populations were few and provided conflicting results. The instruments applied varied widely as did types of educational settings and preparation of the samples.

Perception of Ability

Perception has long been considered an integral component of the personality, personality development, self evaluation and performance. Perception of creative thinking ability was hypothesized by Khatena (1981) as being a predictor of creative thinking ability. Therefore, if nursing students perceived themselves as creative then they should exhibit creative thinking abilities.

Theoretical Perspective

Perception is the result of the accumulation of information by the senses from certain stimuli. How each individual interprets information varies based on previous experiences (Steele & Maraviglia, 1981). According to Kelley (1962), the process of perceiving is a method of directing information to the psychological self which allows it to grow and develop throughout the lifespan. Kelley claimed that the caliber of individual personal behavior was a function of the character of information the individual perceived throughout life. Through selective perception the self is fed particular information which determines the quality of psychological growth. This selective process is influenced by the experience of the individual. In this manner, the perceptive process assists the individual in the pursuit of self-actualization or a fully functioning state.

Perceived creative ability therefore has been found to have an impact on the ability to think creatively. This relationship was identified by Khatena (1977) during the process of developing an

instrument to measure creative perception and concluded that a person "who perceives himself as creative, and with accuracy, is a person who can be expected to behave in creative ways" (p. 517). The belief that the inclination of an individual to perform in creative ways was measurable and that individuals could perceive their ability, lead to the development of the Khatena Torrance Creative Perception Inventory (KTCPI) by Khatena and Torrance (1976). The instrument consists of two individual autobiographical, self report, check-lists that measure creative perceptions. The check-lists are the What Kind of Person Are You? (WKOPAY) and Something About Myself (SAM). Each measures creative perceptions in a different manner. WKOPAY is based on the belief that creative and non-creative behaviors are integral parts of the psychological self, and is designed to stimulate individuals to indicate, on the check-list, their subconscious proclivity to behave in creative ways (Torrance & Khatena, 1970). SAM relies on the products resulting from and the thinking strategies used by individuals that portray creative personality characteristics (Khatena, 1971). Perception of creative thinking ability was operationalized in this study as the total scores obtained on WKOPAY and SAM.

Another instrument designed to measure perception of creative thinking ability was a questionnaire developed by Marriner (1977). The questionnaire was based on a five point likert scale that ranged from outstanding to very poor, and included creativity, sensitivity,

ideational fluency, flexibility, originality, penetration, analysis, synthesis and redefinition.

In summary, perception is a broad concept and an integral part of the personality. Perception of creative thinking ability has been studied by investigators who chose to create their own instrument or chose to use the KTCPI. The KTCPI with its component parts, the WKOPAY and SAM, is the more frequently used instrument focusing on the perception of creative thinking ability.

Perception Of Creative Thinking Ability Of Undergraduate College Students

Investigating the relationship between creative thinking ability and perception of creative thinking ability, Phillips (1973) used the TTCT and the WKOPAY to select a sample from three undergraduate educational psychology classes ($N = 100$) consisting of both male ($n = 24$) and female ($n = 76$) participants. The sample was divided into two equal groups based on high or low scores on the TTCT. Phillips reported that WKOPAY scores of the high creative group ($\mu = 25.02$) were significantly higher than those of the low creative group ($\mu = 22.70$) ($F = 3.14$, $p < .07$). Phillips' findings supported evidence that those who perceived themselves as creative did so in an accurate manner, and that they possessed creative personality characteristics.

In another study of undergraduate college students, Daniels, Heath and Reed (1983) investigated the difference in self-perceptions between education and non-education majors. The sample consisted of a small number of students ($N = 44$) with 28 education and 16 noneducation

majors. The authors used the SAM check list to investigate the self-perceptions of the sample. Results were found to be nonsignificant ($F = 1.16$) for differences between groups using an ANOVA. Evaluating the six creative orientations of the SAM on an individual basis, only the self-strength factor was deemed to be significant. Noneducation students ($\mu = 6.88$) showed significantly more self-strength than the education students ($\mu = 4.96$) ($F = 8.10$, $p < .01$). Discussing the results, Daniels, Heath, and Reed indicated that there was no evidence that college major was necessarily linked to creative behavior.

Daniels, Heath, and Enns (1985) examined the effects of a creativity training activity on perception of creative ability in university women. The sample consisted of women from a variety of schools of study ($N = 140$) who were randomly assigned to the control or experimental groups. SAM was used as a pre- and post-test for both groups. In addition, the experimental group participated in two creativity training sessions involving 20 different activities after the pre-test and prior to post-testing. The control group did not receive any additional treatment.

The data were evaluated using a 2 X 2 ANOVA procedure with grade and group being the two levels of the design. Daniels, Heath, and Enns (1985) reported no significant results for group, grade, or group and grade interaction. Based on the findings, the authors suggested the need to encourage university women to "become more resourceful, versatile, and more willing to take risks" (p. 165).

Perception Of Creative Thinking Ability
Of Students In Nursing And Other Majors

Perception of creative thinking ability was investigated by Marriner (1977) with a subject population of Nursing, English, and Biology students ($N = 590$). Marriner developed a questionnaire that incorporated the creativity and perception concepts from the literature which included creativity, sensitivity, ideational fluency, flexibility, originality, penetration, analysis, synthesis and redefinition. Conclusions determined that students majoring in humanities, professional studies, and social science perceived themselves as being significantly more creative than nursing majors when compared on the creative thinking components of fluency and flexibility ($p < .05$). Nursing majors perceived themselves significantly less creative than other majors with respect to flexibility and fluency, as well as originality and penetration of ideas.

In another investigation involving practicing registered nurses (RNs) with varying educational preparation, Pesut (1988) used the WKOPAY to compare the sample with adult norms and sophomore nursing students. WKOPAY was also used as a pre- and post-test to evaluate the effectiveness of a "self-instructional creativity training program" (p. 101). The sample ($n = 28$) consisted of volunteer RNs from three community hospitals. The majority of the group (57%) were diploma graduates, 36% associate degree graduates, and 7% baccalaureate degreed. Using the total score of WKOPAY, Pesut determined that the RN sample "perceived themselves as slightly more creative than male adults ($\mu =$

28.42, SD = 5.77) or female adults ($\mu = 26.68$, SD = 5.52, $t = 1.68$, $p < .10$)" (p. 101). However, compared with a sophomore nursing student sample, there was no significant difference in the way the RNs and students perceived themselves ($\mu = 28.90$, SD = 7.45, $t = -.029$, $p < .66$).

Comparing the sample to the adult and female norms on the five factors of WKOPAY, four factors were found to be significant. The RNs scored significantly lower than the adult norms ($n = 645$) on Acceptance of Authority ($t = 6.12$, $p < .001$); Self Confidence ($t = 6.20$, $p < .001$); and Inquisitiveness ($t = 6.12$, $p < .001$). There were no significant differences between the samples on the factor of Disciplined Imagination ($t = -1.22$, p ns). RNs scored significantly higher on the factor of Awareness of Others than the adult norm ($t = -7.68$, $p < .001$). When compared to female norms ($n = 455$) the RNs scored significantly lower on Acceptance of Authority ($t = 36.03$, $p < .001$); Self-Confidence ($t = 31.33$, $p < .001$); and Inquisitiveness ($t = 19.06$, $p < .001$). Again the RNs scored significantly higher on the factor of Awareness of Others than the female norm ($t = -40.21$, $p < .001$), and Disciplined Imagination ($t = -15.35$, $p < .001$). In theory, low acceptance of authority and high disciplined imagination would be associated with higher levels of creativity. Therefore, the results indicated a more positive perception of creative ability among nurses than the adult and female norm samples.

In summary, perception is an integral component of the personality and plays a major role in personality development. Perception of

creative thinking ability is thought to be a predictor of creative thinking ability (Khatena, 1981). The two scales of the Khatena-Torrance Creative Perception Inventory, WKOPAY and SAM have been the most widely used measures of perceptions of creative thinking ability.

Of the studies reviewed the samples consisted of general undergraduate college students and nursing students. Phillips (1973), Daniels, Heath, and Reed (1983), and Daniels, Heath, and Enns (1985) studied the general undergraduate college population. Phillips used WKOPAY to measure creative thinking ability and found that individuals who perceived themselves as creative did so accurately. Daniels, Heath, and Reed (1983); and Daniels, Heath, and Enns (1985) used the SAM to measure the perceptions of creative thinking ability. The results of the two studies were not significant.

Marriner (1977) and Pesut (1988) investigated the perceptions of creative thinking ability among nursing students. Marriner used a self developed questionnaire and investigated non-nursing as well as nursing majors. The results determined that non-nursing majors perceived themselves significantly more creative than nursing majors. Pesut (1988) investigated practicing registered nurses and used WKOPAY to measure perceptions of creative thinking ability. When compared to the norms, the RNs scored significantly lower on Acceptance of Authority and significantly higher on Disciplined Imagination, which are two factors

of WKOPAY. These results are associated with higher levels of creativity than more conforming results.

Self-concept

Developed from birth, the self-concept, an integral component of the personality, is equivalent to the perception of self by the individual. Congruence between the ideal self and perceived self helps to determine the ability of the individual to self-actualize and become maximally creative.

Theoretical Perspectives

Self-concept is a broad construct that encompasses many characteristics of the self. Though valued as a construct by psychologists, researchers question the validity of such studies. One facet of the problem is the lack of a precise and stable definition. In broad terms, the "self-concept is a person's perception of himself" which leaves the construct open to a variety of interpretations by investigators (Shavelson, Hubner, & Stanton, 1976, p. 411).

A second facet in the validity question is the large numbers of instruments designed to measure self-concept resulting in an inability to generalize across investigations. Shavelson, Hubner, and Stanton, (1976) recognized the need for evidence of empirical equivalence among measurements and populations and suggested the need for multiple studies using one instrument, with similar and diverse populations.

A third facet refers to the nature of self-concept measurements. The majority are autobiographical, self-report scales that require the

subject to select among desirable and undesirable self-descriptions. Several authors reported skepticism in the ability of the subjects to be objective in their report, predicting they would opt for more socially desirable selections (Cronbach, 1970; Crowne & Stephens, 1961; Snygg & Combs, 1949).

Attempting to quantify the construct, Rogers (1951) provided this definition: "the self-concept or self-structure may be thought of as an organized configuration of perceptions of the self which are admissible to awareness" (p. 136). The components included in Rogers' definition were self perceptions; perceived effect of interactions between the self, others, and the environment; perceived value judgments as related to objects and experiences; and positive or negative perceptions of personal goals and ideals.

A measure of general self-concept which included self-esteem was developed by Coopersmith (1967). The Self-Esteem Inventory (SEI) originally evolved from scale items developed by Rogers and Dymond (1954). Coopersmith defined self-esteem as:

the evaluation which the individual makes and customarily maintains with regard to himself: it expresses an attitude of approval or disapproval, and indicates the extent to which the individual believes himself to be capable, significant, successful, and worthy. In short, self-esteem is a personal judgment of worthiness that is expressed in the attitudes the individual holds toward himself. It is a subjective experience

which the individual conveys to others by verbal reports and other overt expressive behavior (p. 4-5).

Much of the research performed by Coopersmith was devoted to the construct validity of the instrument. Shavelson, Hubner, and Stanton (1976) described the self-concept as having seven unique features: "organized, multifaceted, hierarchical, stable, developmental, evaluative, differentiable" (p. 411). The first feature, "organized", refers to the way the individual categorized experiences as they were reflected by the culture in which the individual was raised.

The second feature, "multifaceted", refers to different facets of the self-concept such as "school, social acceptance, physical attractiveness, and ability" (p. 412). The third feature, the "hierarchical" nature of the self-concept, arranges the facets in order of significance to the self (p. 412). Therefore, the personal experiences the individual has had within the facets of the self-concept formed a hierarchy. The experiences of the individual build the base of the hierarchy, with the general self-concept placed at the top. This hierarchical theory demanded that the self-concept be determined by specific situations (Shavelson, Hubner, & Stanton, 1976).

The fourth feature, "stability", refers to the general self-concept at the top of the hierarchy. As the hierarchy is descended, self-concept becomes situation-specific and less stable. Therefore, an individual could have a situational failure such as an athletic task failure that may disrupt a specific level of the hierarchy

without disturbing the stability of the general self-concept. To alter the stability of the general self-concept, "many situation-specific instances, inconsistent with general self-concept, would be required" (Shavelson, Hubner, & Stanton, 1976, p. 414).

The fifth feature, "developmental", reflects the self-concept development from infancy to the adulthood (p. 414). Infants do not differentiate between themselves, others, and the environment. As they grow, they perceive feedback from the environment and significant others that build their concept of self. The self-concept of the child does not become multifaceted, structured, stable and differentiated until experiences and situations are integrated and coordinated (Shavelson, Hubner, & Stanton, 1976).

"Evaluative", the sixth feature, focuses on feedback received by the individual to specific situations (Shavelson, Hubner, & Stanton, 1976, p. 414). As an infant grows, feedback from significant others in response to the behavior helps the infant form a self evaluative system for the infant. Evaluations are made against ideal standards of behavior which the infant or child senses from the environment and significant others. The strength of the evaluation component varies depending on the situation and individuals involved. As the individual compares the self against what is believed to be ideal, and evaluation perceived by peers and significant others, modifications in the self-concept are made. Therefore, varying levels of significance are given to various dimensions of the evaluation process. The weighting

depends on the how the event was perceived in the past experience, culture, and society. The final feature of self-concept is "differentiable" from other related constructs. "Therefore, the more closely the self-concept is linked with specific situations, the closer is the relationship between self-concept and behavior in the situation" (Shavelson, Hubner, & Stanton, 1976, p. 415).

Psychological literature strongly endorsed the fact that self-concept is closely associated with perceived personal and professional success (Korman, 1970; Wiggins, 1973). Schaer and Trentham (1986) described similar findings when they studied self-concept and job satisfaction. They reported "a significant relationship between teachers' self-concept and job-related attitudes" (p. 955). Self-concept was operationalized in this study as the total score on the Coopersmith Self-Esteem Inventory (Coopersmith, 1967) which produced three scales: social self-esteem, home self-esteem, and academic self-esteem. Other instruments that appeared in the literature were the: Eysenck Personality Inventory (EPI) (Eysenck & Eysenck, 1955); Minnesota Multiphasic Personality Inventory (MMPI) (Dahlstrom, Welch & Dahlstrom, 1979); Scale of Guilt (Buss & Durkee, 1957); Washburne Social-Adjustment Inventory (Washburne, 1940); Social Desirability Scale (Crowne & Marlowe, 1964); Feelings of Inadequacy Scale (Janis & Field, 1959); Empathic Fantasy Scale (Elms, 1966); Locus of Control Scale (Rotter, 1966); Anxiety Differential Scale (Alexander & Husek, 1962); and Tennessee Self-Concept Scale (Fitts, 1965). Each of the above

scales attempted to measure some, but not necessarily the same facet of the self-concept. The large number of different scales to measure self-concept was identified as an impediment to the study of the concept (Shavelson, Hubner & Stanton, 1976).

To summarize, the self-concept was identified as a broad, multifaceted concept that presents the researcher with many problems; namely the lack of a precise and stable definition; the large number of instruments used to measure the concept; and the nature of the measures, often autobiographical or self-report scales. The definition developed by Coopersmith (1967) helped to operationalize the concept, while the features identified by Shavelson, Hubner, and Stanton (1976) assisted in the further understanding of the concept. The large variety of instruments used to measure self-concept made it difficult to compare studies with the same characteristics. Therefore, an attempt was made to compare studies using similar populations or types of studies. The remainder of this section on self-concept will describe studies in the literature using college and nursing populations.

Validation of The Coopersmith Self-Esteem Inventory

Attempting to study the content and construct validity and evaluate the psychometric properties of the Coopersmith SEI, Ahmed, Valliant and Swindle (1985) selected a sample from varying levels of college psychology courses. The sample ($n = 154$) included volunteer subjects who were given bonus points in their courses for participating in the study. Instruments used included the Coopersmith SEI, adult

form; the Psychopathic Deviance, Psychasthenia, and K scales of the Minnesota Multiphasic Personality Inventory (MMPI), (Dahlstrom, Welch, & Dahlstrom, 1979); Scale of Guilt (SOG), (Buss & Durkee, 1957); Test of Self-Efficacy (Ryckman, Robbins, Thornton, & Cantrell, 1982); and the Eysenck Personality Inventory, Form A (EPI), (Eysenck & Eysenck, 1955). Factor analysis produced four factors from the SEI named View of Life, Family Relations, Tolerance and Confusion Level, and Sociability. Results from the analysis concluded that the SEI was a heterogeneous scale.

The correlation results between the SEI and Lie scale of the EPI and the Self-efficacy scale were not significant. However, the negative correlation between the SEI and the Guilt scale was significant (no values given by author). This assessment verified construct validity and was consistent with "the construct of the scale since people of high self-esteem do not feel inadequate about themselves" (Ahmed, Valliant, & Swindle, 1985, p. 1239-1240). Also significant was the negative correlation between the SEI with the Psychasthenia scale ($r = .339$, $p < .05$) of the MMPI. This finding was consistent with the scale in that "people with high self-esteem do not experience or at least express feelings of guilt or anxiety" (p. 1240). The other correlations with MMPI subscales were not significant.

Leung and Sand (1981) investigated the relationship between self-esteem, communication apprehensiveness and general feelings of happiness with a sample consisting of 57 male, and 143 female college

students ($n = 200$) from freshmen to seniors enrolled in psychology courses. Instruments used included the Coopersmith SEI and the Washburne Social-Adjustment Inventory (SAI) to measure emotional maturity which included a lie scale (T1), truthfulness scale (T2), happiness (H), Nonalienation (A), purposefulness (P), self-control (C), impulse-judgement (I), realistic wishes (W), and sympathy (S). High scores on the SEI reflected high self-esteem and low scores on the SAI reflected greater emotional maturity.

The results indicated a significant, negative correlation for females ($n = 143$, $r = -.25$, $p < .01$) and the combined males and females ($n = 200$, $r = -.17$, $p < .01$) between the SEI subscale self-esteem (SE) and lie scale (T1). Additionally, there was a significant correlation for the females between the SE and the truthfulness (T2) subscale of the SAI ($r = .17$, $p < .05$). The authors suggested that females with high self-esteem had an inclination to be less truthful than those with lower self-esteem. However, after dividing the groups by high and low self-esteem, there were no significant F values between high and low self-esteem and the T2 subscale for any of the groups. This result conflicted with the first conclusion from the above correlation.

When the T1 and T2 scores were correlated for the total group ($r = -.22$, $p < .01$) the authors interpreted the results as indicating honest tendencies by both measures. They concluded that there may have been an "halo effect" taking place and that "perhaps high SE females, because of their generally positive image of themselves, are less likely

to notice, hence more likely to overlook, any negative aspects about themselves, while the opposite is probably true of low SE females" (p. 296).

Other results of the study indicated a negative correlation between the SEI and the happiness (H) subscale ($r = -.65$, $p < .01$); nonalienation (A) subscale ($r = -.77$, $p < .01$); purposefulness (P) subscale ($r = -.40$, $p < .01$); self-control (C) subscale ($r = -.45$, $p < .01$); and impulse-judgment (I) subscale ($r = -.27$, $p < .05$); and a positive correlation with realistic wishes (W) subscale ($r = .31$, $p < .01$) of the SAI for the males. Female results indicated negative correlations between the SEI and the happiness (H) subscale ($r = -.59$, $p < .01$); nonalienation (A) subscale ($r = -.66$, $p < .01$); sympathy (S) subscale ($r = -.20$, $p < .01$); purposefulness (P) subscale ($r = -.46$, $p < .01$); self-control (C) subscale ($r = -.53$, $p < .01$); and impulse-judgment (I) subscale ($r = -.28$, $p < .01$); and a positive correlation with realistic wishes (W) subscale ($r = .30$, $p < .01$) of the SAI.

Divided into high and low self-esteem groups, high self-esteem groups had more realistic wishes than low self-esteem males ($F = 10.04$, $p < .01$) and females ($F = 10.04$, $p < .01$). According to the table accompanying the article, low self-esteem groups had significantly higher means for the happiness, nonalienation, purposefulness, and self-control subscales for males and females and impulse-judgment for females.

Study of the construct of self-esteem with a college sample was also the focus of an investigation by Fleming and Watts (1980). The dimensions - organized multifaceted, hierarchical, stable, developmental, evaluative, and differentiable- identified by Shavelson, Hubner, and Stanton (1976), were targeted for comparison with factor analytic results of a questionnaire appropriate for a college age group. The sample consisted of sophomore college students ($n = 106$) enrolled in psychology courses. The self-esteem measure used was the Feelings of Inadequacy Scale (FIS) developed by Janis and Field (1959) and modified to a 7-point Likert scale. Other instruments designed to measure personality characteristics included the Social Desirability Scale (SDS), (Crowne & Marlowe, 1964); Empathic Fantasy Scale (EFS), (Elms, 1966); Locus of Control Scale (LCS), (Rotter, 1966); Anxiety Differential Scale (ADS), (Alexander & Husek, 1962); and the Vocabulary Test (VT) developed by Thorndike (1942) to test verbal intelligence.

Factor analysis of the self-esteem measure items divided into three distinct factors: Social Confidence, School Abilities, and Self-regard. Several of the personality measures correlated with the self-esteem factors. Significant correlations were found between Social Confidence and external Locus of Control ($r = -.29$, $p < .05$), and Situational Anxiety ($r = -.31$, $p < .001$). Verbal Intelligence ($r = .30$, $p < .001$), Need for Approval ($r = -.25$, $p < .001$), Empathetic Fantasy ($r = -.21$, $p < .05$), and Situational Anxiety ($r = -.17$, $p < .05$) significantly correlated with School Abilities. Significant

correlations were also found between Self-regard and external Locus of Control ($r = -.22$, $p < .05$), Situational Anxiety ($r = -.30$, $p < .001$), and the factor of Social Confidence ($r = -.36$, $p < .001$). External Locus of Control ($r = -.30$, $p < .05$), and Situational Anxiety ($r = -.39$, $p < .001$) correlated significantly with the total Self-esteem scores. Demographic measures of self reported GPA, birth order, number of siblings and sex did not significantly correlate with any of the self-esteem factors.

Results indicated that the independence of the School Abilities factor from the other two factors might have been related to the individual academic self-esteem of the sample. In addition, the correlation between Verbal Intelligence and the School Abilities factor seemed to be a predictable outcome and reinforced the factor designation of School Abilities. Need for approval was negatively correlated with the School Abilities factor which confirmed previous research.

The negative correlation between Empathic Fantasy and the School Abilities factor was an unexpected finding for Fleming and Watts (1980). Interestingly, they indicated a possible relationship between teachers rewarding "convergent logical thinking rather than creativity or fantasy" (p. 927-928). Another theory for the failure to learn by empathic students was that they may have been involved in daydreaming or fantasy during learning periods such as class time which would have had a negative effect on their learning. The negative correlation between self-esteem and anxiety confirmed previous research findings and was an

expected outcome of this study. Furthermore, the negative correlation with all factors of self-esteem confirmed the detrimental affect of anxiety on perception of self.

Birth order correlated positively, but not significantly, with Social Confidence ($r = .17$, $p < .10$). Fleming and Watts (1980) suggested that later born children may have higher self-esteem than earlier born siblings. This finding is consistent with research identifying first born siblings as being more dependent.

Self-Concept, Career, and Achievement

Farmer and Fyans (1983) investigated the environmental and psychological influence on career and achievement of married women returning to college after an absence to start a family ($n = 162$). The Coopersmith SEI, adult form was used to determine self-esteem in a sample consisting of 53 freshmen and 109 sophomore women. Three SEI subscales were used in the analyses: Social Self-Esteem (SSE), Home Self-Esteem (HSE), and Academic Self-Esteem (ASE). Four verbal cues were used to measure Fear of success (FOS). Sex role orientation was measured using the Bem Sex Role Inventory (BSRI), which was used to divide the group into feminine and androgynous sex types.

Canonical analyses indicated a relationship between SSE and career motivation which was divided into: total group, androgynous, feminine and undifferentiated classifications. SSE correlated with feminine sex types for the first year sample ($r = -.46$, $p < .05$) and with androgynous sex types for the second year sample ($r = .30$, $p < .05$). Analyses

indicated a relationship between HSE and achievement motivation which was also divided by the total, androgynous, feminine and undifferentiated classifications. The HSE correlated with the first year androgynous sample ($r = -.34$, $p < .05$), feminine sample ($r = -.46$, $p < .05$) and with the second year total sample ($r = -.36$, $p < .05$), (Farmer and Fyans, 1983).

Discussion of the results indicated that the significant relationship between SSE measure and career motivation was negative for the feminine freshmen and positive for the androgynous sophomores. The authors concluded that peer acceptance and support might be responsible for the positive correlation between career motivation and sophomores with androgynous sex type orientation. The results also indicated a significant relationship between HSE and achievement motivation. Achievement motivation negatively correlated with freshmen androgynous and feminine sex type women, and all sophomore women. Conclusions were made that suggested a lack of support of goals from significant others, as perceived by the women with high achievement motivation, as the reason for the negative correlation. Academic self-esteem did not correlate with career or achievement motivation (Farmer and Fyans, 1983).

Resnick, Fauble, and Osipow (1970) investigated the level of vocational crystallization of high and low self-esteem college students. The study involved college male ($n = 114$) and female ($n = 102$) students enrolled in beginning psychology courses. The sample included students

at each level of study from freshmen to seniors, however, the majority were freshmen. Demographic and career choice variables were measured using the Biographical Inventory Questionnaire (BIQ). Degree of preference for a career was measured using the Kuder Preference Record (KPR), (Kuder, 1960), and self-concept was measured using the Tennessee Self-Concept Scale (TSCS), (Fitts, 1965). The sample was divided into high, medium, and low self-concept groups, resulting in equal thirds of the male and female groups.

A significant difference favoring high self-esteem males related to certainty of career choice but there was no significant difference between high and low self-esteem males for KPR scores above 75. Similar results were reported for the female sample: no significant difference between high or low self-esteem females for KPR scores above 75; however, high self-esteem females had greater certainty than low self-esteem females for career choice (Resnick, Fauble, and Osipow, 1970).

Self-Concept, Success and Failure

Watkins and Astilla (1980) investigated the relationship between self-esteem and causes of success or failure in a Filipino college population. The sample consisted of 241 freshmen students enrolled as Liberal Arts majors. Self-esteem was measured by the Coopersmith SEI. A self report to a standard question provided the causal attribution component which was then subdivided into internal and external causal attributes. Subjects were divided into top 25% and

bottom 25% self-esteem groups based on their SEI score. The authors found that internal sources such as ability and effort were related to high self-esteem more often than the external sources such as task difficulty or luck. Additionally, subjects with high self-esteem more often associated success with internal sources than they did failure. In most cases, the Filipino students did not rely on luck as a predictor of success or failure.

The ANOVA procedure was used to determine the attributions of causality to pooled internal sources, ability and effort. Findings for self-esteem main effects ($F = 4.31, p < .05$) were significant as were the findings for future performance main effects ($F = 25.58, p < .05$). A significant F value was also produced for the combined effects of self-esteem and future performance ($F = 7.38, p < .05$). The evaluation of simple effects between self-esteem and success were significant ($F = 11.39, p < .05$) as were the effects between future performance and high self-esteem ($F = 30.21, p < .05$). Interpretation indicated that those with high self-esteem would identify internal sources such as hard work, ability and effort as being responsible for their future successes rather than future failures.

In summary, self-concept, developed as a result of feedback from the environment and significant others, is a significant component of the personality. Literature related to self-concept was divided by college status; career and achievement; and success and failure. Ahmed, Valliant, and Swindle (1985), Leung and Sand (1981), and Fleming and

Watts (1980) studied self-concept of undergraduate college students. Each study utilized different measures for the concept which resulted in variable findings. Farmer and Fyans (1983), and Resnick, Fauble, and Osipow (1970) investigated self-concept, career, and achievement. Farmer and Fyans (1983) found that social and family support played a significant role in goal achievement while Resnick, Fauble, and Osipow (1970) found that high self-esteem was related to certainty of career choice. Watkins and Astilla (1980) examined the relationship between self-concept, success and failure. They reported that internal causal attributes such as ability and effort were more highly related to high self-esteem and success than external attributes.

Perceived Stress

Stress has been identified as an important and necessary variable in life (Selye, 1974). Nursing students are particularly vulnerable to stress in dealing with the lives of other people and their illnesses as well as their own. Many schools of nursing are enrolling more nontraditional students who may face multiple factors that can increase the amount of perceived stress in their lives such as actively pursuing an education, financial worries, and family concerns.

Theoretical Perspectives

Stress and stressors are defined as the events that produce the biological stress response. Selye (1974) defined stress as the "nonspecific response of the body to any demand made upon it" (p. 14). Each stressful event elicits a nonspecific response from the body that

is required for adaptation to the stressor. Selye asserted that any factor that produced the nonspecific response of the body and required adaptation was considered a stressor regardless of whether the agent was pleasant or unpleasant.

Early stress theory focused on the "adaptive-cost hypothesis" (Cohen, 1980, p. 82) which explained the additive effect of continuous adaptation to physical and psychological stressors. The General Adaptation Theory by Selye (1974) supported this hypothesis with the detrimental stage of exhaustion that followed prolonged exposure to stressors. Since the development to the General Adaptation Theory by Selye there have been many attempts to explain the process of stress on the human body. Several theories exist at present that attempt to describe the aftereffects of stress such as information overload, learned helplessness, arousal, and the frustration-mood hypothesis. Additionally, stress has been divided into types: stressful life events and global stress.

Stressful life events are those incidents which "are proximate to rather than remote from the onset of a disorder" (Dohrenwend & Dohrenwend, 1981, p. 2). In other words, stressful life events are specific, identifiable events that closely precede the onset of symptoms associated with a stress related disorder. Cohen, Kamarck and Mermelstein (1983) described global stress as "unpredictable, uncontrollable, and overloading" (p. 387). The amount of global

perceived stress experienced is dependent upon the assessment of the individual regarding situations in their life.

The effect of global stress on individuals depends on their ability to adapt to the stressors. Cohen, Kamarck and Mermelstein determined that levels of perceived stress were influenced by "daily hassles, major events, and changes in the availability of coping resources, all of which are variable over a short period" (p. 393). Spacapan and Cohen (1983) found that anticipation of stressful situations could cause some of the same effects as actual stressful situations. Effects of anticipated, as well as actual, stressful situations include: irritability, frustration, hypertension, poor performance, and other physical symptoms. Gaining control over the stressor and strengthening coping mechanisms have been found to be effective methods of dealing with stressful situations and lessening the effects of stress (Cohen, 1980; Cohen & Williamson, 1988; LaBelle, 1974; Spacapan & Cohen, 1983)

A multitude of responsibilities and expectations presented by faculty, family, social situations and self are potential stressors in the lives of student nurses in academic and hospital settings. Young families, aging parents, financial woes and full or part time employment encroaching on their time and energy, present a type of global stress for nursing students.

LaBelle (1974) who identified stress as a prominent component of nursing education, found that creative problem solving used as a coping

mechanism produces autonomy in students as well as a method of solving stress-inducing situations. Cleland (1965, 1967) studied the effects of situational stress on professional registered nurses and their ability to perform nursing and cognitive tasks. Findings indicated that as stressors increased, cognitive ability and performance deteriorated.

Instruments used to measure global stress that appeared in the literature were: the General Health Questionnaire (GHQ) (Goldberg, 1972); a Stress Inventory (Firth, 1986; Frances & Naftel, 1983); and the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1979). Each of these measures attempt to identify symptoms that result from stressors such as anxiety or depression.

In summary, stress as defined (Selye, 1974) was found to be a result of either pleasant or unpleasant stimuli. Stress was divided into two types: stressful life events and global stress. Global stress is mediated by the ability to adapt to stressors by the individual. Daily hassles, major events, and coping ability all influence the degree of global stress. The remainder of this section will describe studies in the literature which used college or adult populations in identifying perceived stress.

Perceived Stress Level of College Students

Kuiper, Olinger, and Lyons (1986) investigated the interaction between global stress levels and negative life events as they related to the level of depression among college students. The sample consisted of college students enrolled in beginning psychology courses ($n = 120$).

The students who participated received course credit for their involvement. Instruments used were the Beck Depression Inventory (BDI), (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961), the Perceived Stress Scale (PSS), and the Life Experiences Survey (LES), (Sarason, Johnson & Siegel, 1978). Significant correlations were found between the three instruments: BDI to PSS ($r = .58$, $p < .001$); BDI to LES ($r = .47$, $p < .001$); PSS to LES ($r = .38$, $p < .001$). The results were consistent with previous findings in regard to the PSS and the BDI (Cohen, Kamarck, & Mermelstein, 1983). Multiple regression analysis was then used to determine whether the interaction between the LES and PSS was predictive of BDI scores. Findings indicated significant main effects for both the LES ($R^2 = .26$, $F = 41.65$, $p < .001$) and PSS ($R^2 = .43$, $F = 35.43$, $p < .001$) as well as significant interaction effects ($R^2 = .47$, $F = 7.07$, $p < .01$). Using the PSS and the LES, the investigators split the groups at the median and used a two-way ANOVA and determined that the main effects of both PSS and LES were significant "(F 's (1, 116) = 8.75, p 's < .01)" (p. 152). The results indicated that individuals with negative life events and low levels of perceived stress had lower depression levels than those with negative life events and high levels of perceived stress.

Lesko and Summerfield (1989) investigated the impact of examinations and assignments on the health of college students. The sample consisted of female undergraduate students enrolled in psychology and health courses ($n = 35$). The study included physiological measures

of weight, blood pressure, and pulse rate. Data collection consisted of weekly self report responses to questions, on a scale of one to seven, regarding the amount of stress; amount of exam stress; amount of assignment stress; amount of non-school stress. In addition, subjects reported incidence of illness; number of exams; number of assignments; medication usage; amount of exercise; and results of physiological measures over a 10 week period.

The findings indicated a significant correlation between number of exams and incidence illness ($r = .32, p < .05$), and number of assignments and incidence of illness ($r = .45, p < .05$). However, the amount of perceived stress related to exams and assignments did not significantly correlate with incidence of illness. Additionally, perceived stress related to assignments correlated significantly with diastolic blood pressure ($r = .31, p < .05$). During the final exam week, diastolic blood pressure significantly correlated with overall reported stress levels ($r = .54, p < .001$), and the amount of exam stress ($r = .44, p < .01$). Other correlates indicated that those students with higher grades reported less incidence of illness ($r = -.41, p < .01$); freshmen and sophomores reported higher weekly levels of stress than upper classmen ($r = .33, p < .05$); and those who exercised more frequently reported less assignment related stress ($r = -.34, p < .05$).

Reifman and Dunkel-Schetter (1990) investigated perceived health and well-being as it related to social support and interaction of

college students. The sample consisted of male and female college students interviewed by telephone ($n = 161$). Instruments used were the four-item Perceived Stress Scale adapted for the telephone interview; a six-item academic stress index developed by students; a four item social support measure; two health and well-being measures, one adapted from the Center for Epidemiologic Studies-Depression Scale (depression scale) and the other a two-item satisfaction index of how happy they perceived themselves to be; and finally, a single item measure (health) constructed by students.

Findings indicated that academic stress was significantly correlated with the depression scale ($r = .31, p < .0001$), satisfaction ($r = -.40, p < .0001$), and health ($r = -.16, p < .05$). The Perceived Stress Scale was significantly correlated with depression scale ($r = .58, p < .0001$), satisfaction ($r = -.67, p < .0001$), health ($r = -.35, p < .0001$), and social support ($r = -.16, p < .05$).

Perceived Stress Level of Nursing Students

Beck and Srivastava (1991) studied the sources and perception of stress in a sample which included both generic ($n = 67$) and RN ($n = 25$) nursing students enrolled in a baccalaureate nursing program from the sophomore through senior levels ($N = 94$). Measures included the General Health Questionnaire (Goldberg, 1972) which provides a level indicating general strain or distress and borderline mental conflict, and the Stress Inventory (Firth, 1986; Frances & Naftel, 1983) consisting of two parts. Part one asks for a description of a stressful event (S11),

while part two contains a rating scale of 44 items requiring responses to a five point scale on stressfulness of the item (SI2).

Results indicated that all of the students' mean scores were significantly higher than the norm as measured by the General Health Questionnaire. In addition, scores for the nursing students were two times as high as previously reported scores for medical students. Within the sophomore year, the generic students ($\mu = 26.82$) showed significantly higher means on the General Health Questionnaire than the RN students ($\mu = 16.17$) ($p < .05$). The SI1 indicated consistently high levels of stress across all levels of the program. At least 50% of the group consistently selected the 12 highest ranking stress items from the SI2. Items contributing the highest levels of stress were classified under the categories of "career choice, academic environment, financial, and personal". Categories of satisfaction indicated by the students were "relationships with patients, new learning experiences, and helping others" (p. 130). In general, this study determined that students with high levels of perceived stress were more likely to develop a psychological or physical illness.

Carter (1982) investigated the amount of distress experienced and coping styles used by senior female nursing and liberal arts majors. The sample consisted of senior female students from three baccalaureate schools of nursing ($n = 103$) and from one liberal arts college ($n = 103$). Instruments used included the SCL-90R (Derogatis, 1977), a checklist of psychological symptoms ranging from mild somatization to

psychoticism; the Social Network Index, (Renne, 1974); a Coping Scale which measures six coping styles (Duff, 1979); and a Drug Use Survey, (Shapiro, unpublished) which indicates frequency of drug use.

Findings indicated that the two groups were homogeneous with respect to the SCL-90R except for the dimension of psychoticism. The liberal arts women ($\mu = .71$) showed significantly higher means for this dimension than the nursing women ($\mu = .54$) ($t = 1.98$, $p < .05$). "This dimension provides a graduated continuum from mild interpersonal alienation to more florid evidence of psychosis" (p. 249). The Social Network Index produced results that indicated that the participants from both groups had very few people with which they felt comfortable, including family members and friends. Additionally, the nursing students depended more on their children ($t = 3.82$, $p < .01$) and friends away from school ($t = 2.18$, $p < .03$) for social support than the liberal arts students. The liberal arts students, on the other hand, depended more on friends at school ($t = 2.0$, $p < .04$) and school counselors ($t = 2.57$, $p < .01$) than the nursing students. With respect to the Coping Scale, the groups were fairly homogeneous except for the liberal arts women being more college oriented than the nursing women ($t = 1.95$, $p < .05$). Results of the Drug Use Survey indicated low use of drugs by both groups, however, the liberal arts women reported more over-the-counter drug use than the nursing women. Weekly alcohol consumption was reported by 39% of the nursing women and 47% of the liberal arts women. Conclusions by Carter indicated that for the most part the two groups

were homogeneous; however, Carter suggested the need for appropriate coping styles and strengthened interpersonal networks for both groups to assist in dealing with day to day conflicts between realistic and ideal expectations.

Charlesworth, Murphy, and Beutler (1981) studied the use of relaxation training as a method of reducing anxiety and improving cognitive performance in nursing students. The experimental group consisted of female nursing students ($n = 10$) enrolled in a major nursing course. The control group consisted of seven female and one male student ($n = 8$) in an equivalent course in the same curriculum. The State-Trait Anxiety Inventory (STAI), (Spielberger, Gorsuch, & Lushene, 1979) was used as the pretest, midterm, and final measure of stress. The control group received no treatment. The experimental group received comprehensive stress management training (SMT) twice a week for five weeks after the pretest. Additionally, they were given audio tapes and were encouraged to practice with them at home on a daily basis. The midterm and final STAI measures were taken immediately before the midterm and final exams for the courses. The grade point averages for both groups were examined for homogeneity during the previous year. The difference between groups was not significant; however, the control group had higher mean grade averages than the experimental group.

Results of the data indicated that on pretest, the groups were homogeneous with respect to the state and trait anxiety measures.

Additionally, no differences between the means of the groups were found with respect to the midterm and final measures of state anxiety. Trait anxiety measures were found to differ for the groups for the final measure only. The control group ($\mu = 40.4$) was found to have significantly higher levels of trait anxiety at the final than the experimental group ($\mu = 35.0$) ($t = (1, 10) 2.14, p < .05$).

No significant differences were found between groups for the midterm and final course grades; however, the control group scored higher than the experimental group on the exams, which was consistent with their higher grade point averages at the onset of the study.

Discussion of the results indicated improved generalized (trait) anxiety. Subjective reports of reduced state and trait anxiety were given by all experimental subjects. Although the control group maintained superior midterm and final exam scores, there was a slight increase in state and trait anxiety between the midterm and final testing for that group (Charlesworth, Murphy & Beutler, 1981).

In summary, perceived stress of a global nature is influenced by daily activities including daily hassles, and annoyances. The degree to which perceived stress interfered with psychological and physical health were identified in the literature. Lacking in the literature was the degree to which perceived stress impacted cognitive and creative thinking abilities.

The literature was divided among general undergraduate college students and nursing students. Kuiper, Olinger, and Lyons (1986), Lesko

and Summerfield (1989), and Reifman and Dunkel-Schetter (1990) investigated general undergraduate college students. Kuiper, Olinger, and Lyons (1986) found that negative life events coupled with high levels of perceived stress produced more depression in the sample. Lesko and Summerfield (1989) found that increased levels of perceived stress produced more illness related physical symptoms. Reifman and Dunkel-Schetter (1990) found that academic stress and perceived global stress bears a positive significant relationship to depression, and negative significant relationship to satisfaction and health. In addition, perceived global stress was significantly, negatively correlated with social support.

Beck and Srivastava (1991), found that nursing students were experiencing higher levels of general strain or distress than medical students. They also determined that students with high levels of perceived stress were more likely to develop psychological or physical illness. Carter (1982) reported that nursing students perceived little social support and that nursing students depended more on children and friends outside of the academic setting than non nursing majors. Charlesworth, Murphy, and Beutler (1981) determined that relaxation training could reduce trait anxiety but not necessarily affect course grades.

Summary

This review of literature reflects a sampling of the current published works that addressed creative thinking, perception of creative

thinking ability, self-concept, and perceived stress. Some articles discussed creative thinking ability and its impact on nursing education (Aichlmayr, 1969; Demetrulias & Shaw, 1985; and Stepp-Gilbert & Wong, 1985). The consensus of the authors suggests that creative thinking ability is a necessary characteristic for the nurse dealing with the challenges of the present and future including scarce resources, and technological advances.

The literature regarding Creative Thinking Ability was reviewed finding that some studies explored the affects of types of nursing curriculum and its ability to influence creative thinking (Eisenman, 1970; and Torrance, 1964). Other studies examined levels of professional training such as diploma, associate, and baccalaureate degree and their effect on creative thinking ability of students (Sullivan, 1984, 1987; Ventura, 1979; Ventura & Meyers, 1976). Some of the programs of nursing described in the literature utilized innovative approaches to the curriculum to stimulate creative thinking and problem solving in students (Bailey, McDonald & Claus, 1970; Harms & McDonald, 1966a, 1966b; McDonald & Harms, 1966; and Thomas, 1979). However, the variety of instruments and populations used made it difficult to find consistency across programs of nursing, populations and studies.

The literature regarding Perception of Creative Thinking Ability was organized by studies that investigated college populations (Daniels, Heath & Enns, 1985; Daniels, Heath & Reed, 1983; and Phillips, 1973) and nursing populations (Marriner, 1977; Pesut, 1988). The measures for

perception of creative thinking ability found in the literature, were inconsistent and provided a variety of findings. The components of the KTCPI were used more consistently than any other measure but results were variable.

Literature that exists on the construct of Self-Concept covers many aspects of the self. Studies relating to the college population contained a variety of self-concept measures as well as a variety of convergent and divergent measures. This pattern of inconsistent, multiple measures was identified by Shavelson, Hubner and Stanton (1976) as interfering with the study of self-concept. The literature was divided by different focuses. Self-concept of undergraduate students was studied by Ahmed, Valliant, and Swindle (1985); Leung and Sand (1981); and Fleming and Watts (1980). Self-concept, career and achievement was the focus for Farmer and Fyans, (1983) and Resnick, Fauble, and Osipow (1970). Watkins and Astilla (1980) focused on self-concept related to success and failure.

The literature reviewed regarding Perceived Stress was divided into investigations involving college students in general and those involving nursing students. Kuiper, Olinger, and Lyons (1986) related global stress to depression among college students. In a study of perceived stress and nursing students, Beck and Srivastava (1991), indicated that nursing students reported significantly higher levels of general strain or distress than normal individuals and levels two times as high as previously reported scores for medical students. Carter

(1982) investigated perceived stress, coping, social support, and drug use among nursing students as well as liberal arts majors.

Charlesworth, Murphy, and Beutler (1981) also investigated nursing students, but in an experimental pre-test, post-test study. They implemented relaxation training with the experimental group as a method of reducing anxiety and improving cognitive performance.

In conclusion, it is clear from the literature that there exists a need for continued study of creative thinking ability, perception of creative thinking ability, self-concept, and perceived stress. None of the studies reviewed, explored all of the concepts in the same population. There exists a need for a descriptive, correlational investigation of these concepts in a consistent and relevant manner in the nursing population.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

A nonexperimental, descriptive correlational design provided the structure for answering the research questions in this study. This design was appropriate to determine the current level of creative thinking ability of the sample. In addition the design allowed for determination of the variance in the dependent variable attributable to the independent variables. The dependent variable was the creative thinking ability of female nursing students. The independent variables were perception of creative thinking ability, self-concept, and perceived stress of the student nurses. Demographic variables collected were gender, age, number of full-time college semesters completed, whether or not the subjects have completed a college degree, and college standing (junior or senior).

Multiple regression analyses were used to determine the variance in creative thinking ability explained by perception of creative thinking ability, self-concept and perceived stress. The Pearson correlation was used to determine the relationship between creative thinking ability and the interval/ratio level demographic variables, age and number of full-time college semesters completed. Descriptive statistics were used to analyze the demographic data and describe the sample.

The research questions in this study were developed to identify the level of creative thinking ability of nursing students, their perceptions of their creative thinking abilities, self-concept, and perceived stress during the time frame of the study. The Torrance Test of Creative Thinking (TTCT), Perceived Stress Scale (PSS) (Appendix A), the Khatena Torrance Creative Perceptions Inventory (KTCPI), the Coopersmith Self-Esteem Inventory (SEI), and the Demographic Data Profile (DDP) (Appendix B), were used to collect the data to answer the research questions.

Setting

The setting for the study was in the southern portion of the United States in a metropolitan port city with a population of approximately 60,000. The school of nursing used is conveniently located at a major medical center in the city. The university is a state supported institution with a primary mission of educating health care professionals. The university houses four schools: Graduate School of Biomedical Sciences, School of Nursing, School of Medicine, and School of Allied Health Sciences. The Graduate School of Biomedical Sciences offers master's and doctoral level programs in most areas of medical science as well as a Masters of Science in Nursing. The current enrollment at the Graduate school is approximately 280 students.

The nursing school offers an upper-division Bachelor of Science degree program with a flexible tract for registered nurses returning for a baccalaureate degree. The school also offers a Masters of Science

degree program with four areas of clinical emphasis. The graduate nursing program is offered through the Graduate School of Biomedical Science and includes specialities in Nursing Management, Primary Care Practice, Advanced Clinical Nursing and Nursing Education. The undergraduate enrollment at the school of nursing at the time of the study was approximately 385 students, of which 216 were traditional generic students and 169 were flexible tract students returning for a bachelors degree. In addition to the degree programs, the school offers ongoing continuing education programs.

The environment in which the instruments were administered was a thermostatically controlled classroom which provided comfort and quiet. Tables and comfortable chairs or desks were provided to allow students adequate space for ease during completion of the questionnaires. Privacy was afforded the subjects during instrument administration by spacing between desks or tables.

Population and Sample

The population from which the sample was selected consisted of students enrolled in a collegiate program of nursing leading to a bachelors degree. Approximately 30 percent of the female undergraduate, generic nursing students were recruited into the study. After eliminating the male students, 60 female students were randomly selected from the registrar's list of students enrolled in the generic nursing program. The registrar's list remained confidential and was destroyed at the end of the research study. The list was numbered and students

were randomly selected using a computer generated list of random numbers with a random start. This procedure continued until 60 students were selected. Alternate students were also selected to be used in the event that some of the original subjects declined to participate in the study.

A small sample was used to keep the cost involved with the study within reasonable limits and yet permit statistical analysis. The cost involved for the instruments and scoring for sixty subjects was approximately \$539.05 or approximately \$8.98 per subject.

After the random selection of students was completed, the subjects were asked to participate in the study. An invitation to participate was initiated at the end of a regularly scheduled class where each potential subject received an invitation letter (Appendix C). The invitation letter included a time and place to meet to participate in the study. A phone number was included to allow for rescheduling if the time was not convenient. None of the students dropped out of the study, however, several declined to participate in the study due to time and workload constraints. Therefore, alternate students were selected to participate in the study.

Criteria for inclusion of subjects in the study included the following:

1. English speaking.
2. female.

3. enrolled in the generic undergraduate nursing program.
4. over the age of 18.

Protection of Human Subjects

All current rules and regulations regarding the use of human subjects as specified by the Texas Woman's University Human Subjects Review Committee and the committees of the study site were adhered to. Each subject received a letter inviting them to participate in the study (Appendix C). Attached to the invitation letter was a written description of the study. The written description addressed the purpose of the study, the data collection methods and time required by the subjects to participate. All potential risks and benefits that could reasonably be expected were discussed at that time. The subjects were informed that there were no alternative procedures available for this study but that they did have the choice of not participating.

Procedures taken to protect the confidentiality of the participants included the use of coding to eliminate subject names. Data collection forms were identified by coded numbers. The list of names and code numbers were kept in a locked drawer in a desk to which only the investigator had the key. Upon completion of the study, the list of names and code numbers were destroyed. Data was reported as group data in written or spoken presentations of the study. In no way could participation in the study influence the individual's work or school activities. No individual results were reported to schools or work

settings. Upon completion of the study, the participants received their individualized Torrance Test Of Creative Thinking summary. The participants received a card indicating their code number during the time of questionnaire completion. This card was exchanged for their individualized TTCT summary upon completion of the study. In the event someone misplaced a coded card, the list of names were used to identify the code and the TTCT summary was given to the participant.

Participation in the study was voluntary and without intimidation or prejudice toward those who declined to participate. Participation was without financial remuneration. The study was not expected to result in any physical injury to the subjects. Therefore, there was no compensation or medical treatment provided by the investigator, Texas Woman's University, or the university where the students were enrolled.

All subjects were provided with the investigator's name and phone number to discuss any concerns or to answer questions regarding the study. Subjects who agreed to participate in the study indicated their willingness by completing the questionnaires. The study met the requirements for being exempt from review by the Human Subjects Review Committee of Texas Woman's University at Houston. The study also met the requirements and was approved for expedited review by the institution where the study took place (Appendix D).

Instruments

Five instruments were used in the study. The Torrance Test of Creative Thinking (TTCT), the Khatena Torrance Creative Perceptions

Inventory (KTCPI), the Coopersmith Self-Esteem Inventory (SEI), the Perceived Stress Scale (PSS), and a Demographic Data Profile (DDP) were used in data collection. With the exception of the DDP, all of the instruments in this study have been used previously and have accumulated a variety of reliability and validity information. The DDP was developed specifically for this study to collect information to describe the sample.

Torrance Test of Creative Thinking

The TTCT (1974) was developed for use with students in grades K through graduate school. The TTCT consists of two types, a verbal test and a figural test. Both the verbal and figural forms of the TTCT measure four important mental characteristics associated with creative thinking. The four characteristics are: fluency, flexibility, originality, and elaboration. The verbal form uses word-based exercises and the figural form uses picture-based exercises. Both forms of the test have an equivalent form to be used in the event of a pre-test and post-test situation (Torrance, 1974). Although the norms-technical manual did not rate whether the verbal or figural form of the test was more effective in measuring creative thinking, the figural test was chosen for use in this study. The decision to use the figural form came about as a result of discussions with an assistant at the Torrance Center. The decision to use the figural form was supported because of its streamlined scoring format that is more easily scored, interpreted,

and provided complete information about creative thinking ability (V. Connell, personal communication, April 20, 1989).

Thinking Creatively With Pictures. The figural form of the TTCT is titled Thinking Creatively With Pictures. This test is appropriate for use with children, adolescents and adults. The test contains three subtests: Picture Construction, Incomplete Figures, and Repeated Figures. These tests were scored on fluency, flexibility, originality, and elaboration. All scores were accumulated across subtests, totaled, and reported as raw scores, standard scores, national percentiles, and local percentiles. High scores on the TTCT indicated high levels of creative thinking ability and low scores indicated low levels of creative thinking ability. Each activity was scheduled to be completed in ten minutes, with a total of 30 minutes for the entire battery. Speed in completing each activity was more important than artistic ability. The streamlined scoring procedure reported scores for originality, elaboration, flexibility, and fluency for each activity. Raw scores for each of the components of the test can range from one to 40. The total scores from the figural test can be converted to standard T scores. T scores are interval level data and are therefore subject to several types of statistical analyses (Torrance, 1974; Torrance & Ball, 1984).

The activities contained in the TTCT involved three unique creative tendencies: "the tendency toward structuring and integrating", "tendency toward disruption of structure in order to create something

new" and the "tendency toward finding a purpose for something that has no definite purpose and to elaborate it in such a way that the purpose is achieved" (Torrance, 1974, p. 15).

According to Torrance (1974), creative thinking "requires high motivation and persistence, taking place either over a considerable span of time (continuously or intermittently) or at high intensity" (p. 10). The tasks presented in the TTCT were based on the motivators: fluency, flexibility, originality and elaboration. The first task of the test, The Incomplete Figures Activity, was primarily motivated by originality and unusualness with elaboration as a secondary motivator. The second task, The Circles or Parallel Lines Activity (repeated figures) was primarily motivated by variety or flexibility of the response along with originality and elaboration. In the third task, The Picture Construction Activity, fluency was the first consideration and originality, elaboration and flexibility were secondary (Torrance, 1974).

The TTCT, in use since the 1960's, has been used at many developmental levels. The extensive use of the instrument provided data for reliability and validity. Interrater reliability correlations for scorers with different levels of experience ranged from between $r_{xx} = .86$ to $r_{xx} = .99$ with an average of $r_{xx} = .95$ ($n = 100$). Classroom teachers who studied the scoring guide had mean interrater reliability correlations ranging from $r_{xx} = .88$ for originality to $r_{xx} = .96$ for fluency ($n = 100$) (Torrance, 1974).

The TTCT has been evaluated by several experts in the field of creativity which reinforced content validity. The method used to develop the instrument as well as the extensive testing and redevelopment of the instrument insured the content validity (Torrance, 1974).

Treffinger (1985) determined that TTCT scores correlated with other creative thinking activities such as creative leadership, talent evaluations and ratings of creative students by teachers. However, no data were reported as to the construct validity of the test. Treffinger also reported support for the predictive ability of the TTCT. Noted was a positive and significant correlation between TTCT scores in short and long-term studies involving creative achievement, however, no data were given.

Permission to use the TTCT was implied when the instrument was purchased. The instrument was scored by the Scholastic Testing Service who provided the streamlined scoring process. The TTCT is copyrighted and therefore cannot be duplicated or published.

Khatena Torrance Creative Perceptions Inventory

The KTCPI (1976) is divided into two sections What Kind of Person Are You? (WKOPAY) and Something About Myself (SAM). These tests have been used with older school aged students, adolescents, and adults. Both tests are suitable for administration in group settings and should be considered as a battery of separate tests rather than sub-tests.

What Kind of Person Are You. The WKOPAY is a 50 item, forced choice, diverse alternative, short statements instrument. The checklist consists of items "that are socially desirable or undesirable and relatively creative or noncreative" (Bledsoe & Khatena, 1974, p. 143). The instrument measures an individuals propensity to act in creative ways (Khatena & Torrance, 1976). Scoring is accomplished using a scoring key and responses are given a one or zero depending on the key. After a raw score is determined, five factor scores are calculated by counting the points associated with the factors. Raw scores are converted to standard scores using the conversion table in the manual. A high score on the WKOPAY indicated a high tendency to act in creative ways and a low score represented the opposite.

The WKOPAY produces five factors. The factors are: Acceptance of Authority, Self Confidence, Inquisitiveness, Awareness of Others, and Disciplined Imagination. The items in the WKOPAY that corresponded to the factors ranged from six items for Inquisitiveness to twelve items for Self Confidence.

Interrater reliability was found to be $r_{xx} = .99$, ($p < .01$) ($n = 50$) by Khatena and Torrance (1976). Internal consistency of the WKOPAY using the split-half method was found to be $r_{xx} = .98$ ($p < .01$). Others using the instrument reported reliabilities ranging from $r_{xx} = .71$ to $.97$ ($p < .01$) (Joesting & Joesting, 1973; Torrance & Khatena, 1970).

Content validity was determined through years of study in the field of creativity and through the use of over 50 empirical studies

used to compose the WKOPAY (Khatena & Torrance, 1976). Factor analysis was used for evidence of construct validity. Bledsoe and Khatena (1974) analyzed the instrument using 645 subject responses. From this analysis, five factors arose as pertinent to the sensitivity of the instrument to measure creative and less creative self-perceptions. The factors identified through this analysis were acceptance of authority, self-confidence, inquisitiveness, awareness of others and disciplined imagination.

Something About Myself. SAM measures a different realm of creative personalities and is considered to be an autobiographical instrument. Khatena and Torrance (1976) agreed with Rhodes' (1961) suggestion that "creative people could be identified through their personality characteristics or "person", their thinking operations or "process", their productions or "product", and their response to stress situations or "press"" (p. 26). This orientation was valuable during the development of the SAM. The instrument consists of 50 self-descriptive statements. The respondent is instructed to place a check mark by the statements that are applicable to the person. Those statements that are not applicable are to be left blank. Scoring is accomplished by summing the number of check marks on the instrument. The blank items are counted as zero. The scores for the instrument range from zero to 50. Scoring of the SAM produces raw and standard scores and six factor scores. High scores on the SAM indicate that individuals perceive themselves as possessing many creative thinking

personality characteristics. Low scores indicate that perception of creative thinking characteristics is low.

The SAM produces six factor scores. The factors are: Environmental Sensitivity, Initiative, Self Strength, Intellectuality, Individuality, and Artistry. The number of items associated with each factor varies, for example, the factor Artistry consists of five items and the factors of Self Strength and Intellectuality consist of ten items each.

Given the format of the instrument and the ease of scoring, the interrater reliability was high at $r_{xx} = .99$ ($p < .01$) (Khatena & Torrance, 1976). Internal consistency was determined by the Split-Half Reliability Coefficient using a random sample of 120 responses, half college adults and half adolescents. The correlation was corrected with the Spearman-Brown Prophecy Formula which produced reliabilities of $r_{xx} = .92$, $.95$, and $.94$ for the groups independently and combined. Test-retest reliability was determined from the responses of 81 subjects with fluctuating time intervals of one day to four weeks. Test-retest reliabilities ranged from $r_{xx} = .77$ to $.98$. ($p < .01$) (Khatena & Torrance, 1976).

Construct validity was verified through factor analysis by Bledsoe & Khatena (1973). The SAM was administered to a co-ed population from four different colleges and three different high schools with a total sample of 672. The analysis produced six factors: environmental

sensitivity, initiative, self-strength, intellectuality, individuality, and artistry.

Both tests, the WKOPAY and SAM are easily scored and scoring may be achieved by either hand or computer. Training for administrators and scorers of the inventories is not necessary. Each tests takes about five minutes to complete. Permission to use the KTCPI was implied when the instrument was purchased. The KTCPI is copyrighted and therefore cannot be duplicated or published.

The Coopersmith Self-Esteem Inventory

The Coopersmith Self-Esteem Inventory is a well known and widely used measure of self-concept (Johnson, Redfield, Miller & Simpson, 1983). The SEI is a self-report questionnaire that measures an individual's overall or total self-regard (Wylie, 1961). Self-esteem is regarded as the self evaluation component of the self-concept (Gergen, 1971). The SEI was originally developed from the Butler-Haigh Q Sort for use with children. "All the items in the final scale were agreed upon by five psychologists as indicating either high or low self-esteem; and repetitious, ambiguous items were eliminated" (Wylie, 1961, p. 171). The instrument currently is available in two forms, the school form (a) which has 58 items, and the adult form (b). The adult form, designed to be used with ages 16 and older, consists of 25 items that factored out highly in factor analysis. A high correlation between the school and adult forms was reported by Shavelson, Hubner, and Stanton (1976) at $r = .86$.

Internal consistency reliability was reported by Dyer (1964) for a sample consisting of elementary and high school boys and girls. The reliabilities ranged from $r_{xx} = .28$ to $.82$ for the four parts of form A. Dyer also reported test-retest reliability for a sample consisting of fifth graders of $r_{xx} = .88$ ($n = 30$) for a five week time span. Test-retest reliability for public school students was reported at $r_{xx} = .70$ ($n = 56$) over a three year time span. Dyer found that the reliability appeared to be stronger using the total test scores rather than individual subtest scores.

Johnson, Redfield, Miller & Simpson (1983) reported SEI convergent validity with the Piers-Harris Children's Self-Concept Scale (CSCS) and the Coopersmith Behavioral Academic Assessment Scale (BASE). The SEI was reported to correlate with the CSCS with a coefficient of $r = .63$, ($p < .01$) $n = 105$. The correlation coefficient between the SEI and the BASE was $r = .47$, ($p < .01$) with the same sample. Discriminate validity was tested using the Children's Social Desirability Scale (CSDS). A correlation coefficient of $r = .17$ ($p < .05$) indicated that different constructs were being measured by the CSDS and the SEI.

Internal consistency reported by Johnson, Redfield, Miller & Simpson (1983) using Cronbach's alpha coefficient was $\alpha = .86$ for the total test. The subscale coefficients ranged from $\alpha = .61$ to $.71$ for the five subscales. Reliability for the adult form B for a sample of 226 college students was $r_{xx} = .78$ for students 16-19 years of age, and

$r_{xx} = .85$ for students 20-34 years of age. The difference between the two groups approached significance at $p = .06$ (Coopersmith, 1981).

The SEI is brief and easily scored and relatively inexpensive to administer. The instrument can be scored by hand for total and subscale scores. Permission to use the SEI was implied when the instrument was purchased. The SEI is copyrighted and therefore cannot be duplicated or published.

Perceived Stress Scale

The PSS developed by Cohen, Kamarck and Mermelstein (1983) gauges the extent to which life situations during the past month, for an individual, are perceived as stressful. The PSS measures global stress rather than specific instances of stress. The instrument "is sensitive to chronic stress deriving from ongoing life circumstances, to stress from expectations concerning future events, to stress from events not listed on a particular life-events scale, and to reactions to the specific events included on any scale" (p. 387). This global measure of stress eliminates the need for the subject to identify specific sources of stress that may be inaccurate.

The PSS is a 14-item scale (PSS14) composed of statements regarding recent incidents that may have left individuals with the sensation that their lives were "unpredictable, uncontrollable, and overloading" (p. 387). The statements are arranged with a Likert type scale that ranges from never, almost never, sometimes, fairly often to very often. A value is assigned to each response with never being zero

and very often being four. The scale is scored by reversing the positively stated items and then summing all of the items. The items stated in a positive manner are items 4, 5, 6, 7, 9, 10, and 13. High scores indicate high amounts of perceived stress while low scores indicate low amounts of perceived stress. The possible range of scores on the 14 item PSS is from zero to 56.

According to Cohen and Williamson (1988), the PSS can also be used as a reduced format of ten items (PSS10) by eliminating items 4-5, 12-13 which were found to have low factor loadings. Reliability reported for the PSS10 was $r_{xx} = .78$ ($n = 960$ males and 1427 females). An even shorter version of the PSS includes four items (PSS4) which were found to have high factor loadings. This version includes items 2, 6, 7 and 14. Reliability reported for the PSS4 ranged from $r_{xx} = .60$ to $.72$ for the same sample.

In addition to ease of scoring, the PSS is economical in both cost and administration time. The instrument takes approximately five minutes to complete and can be scored by the researcher. The PSS is designed to be used with samples with a minimum of an eighth grade education. It has been used with college students and a heterogeneous community group in a smoking-cessation study. The results of the PSS were found to be consistent regardless of age or sex. The coefficient alpha reliability for the scale ranged from $r_{xx} = .84$ and $.85$ for two groups of college students with a test-retest correlation of $r_{xx} = .85$ for the second group of 82 college students. The retest situation was a

short interval of two days for the college group. The coefficient alpha reliability for the community group was $r_{xx} = .86$ with a test-retest reliability of $r_{xx} = .55$ for 64 subjects. The retest situation for the community group was six weeks (Cohen, Karmarck & Mermelstein, 1983).

The community group was divided into two groups. The "young" group consisted of 31 persons, with ages ranging from 22 to 35. The "old" group consisted of 33 persons, with ages ranging from 36 to 70. The scores were converted to z scores and the Fisher's transformation used to determine that only one comparison was significantly different at the $p < .01$ level. In another study, internal consistency reliability for post-surgical recovery patients ($N = 119$) was reported at $r_{xx} = .87$ for the 14 item scale. Reduced to a ten item scale, the reliability for the same subjects was reported at $r_{xx} = .88$ (Edwards, 1990). Since the PSS is in the public domain, permission from the author was not necessary for use. The instrument appears in Appendix A

Demographic Data Profile

Demographic information was collected on the following student variables: age, marital status, ethnicity, college degrees completed, total number of full time semesters completed and college level (junior or senior). The demographic profile was completed in less than five minutes.

Data Collection

Data collection took place after permission was obtained from the Texas Woman's University and all institutions where data collection

would occur. Potential nursing student subjects were randomly selected from the registrars list using a computer generated list of random numbers with a random start. Alternate subjects were also selected at that time for use in the event selected subjects declined to participate.

After the subjects were selected, invitation letters (Appendix C) to participate in the study were distributed along with a written description of the study. The invitation letter contained a date, time and place for the administration of the instruments. A phone number was also provided for rescheduling of data collection in the event the subjects were not able to attend on the scheduled date. At the time of administration, instrument packets containing the Demographic Data Profile, the Torrance Test of Creative Thinking, the Khatena Torrance Creative Perceptions Inventory, the Coopersmith Self-Esteem Inventory, and the Perceived Stress Scale were distributed. Specific instructions for the completion of the instruments were given during the administration. At the time of administration subjects received coded cards to be exchanged at the completion of the study for a copy of their personalized results on the TTCT.

Treatment of Data

Descriptive and inferential statistical analysis was used in this study. Descriptive statistics were employed to describe the sample using the demographic data. Age, marital status, ethnicity, college degrees completed, total number of full-time college semesters completed

and college level were subjected to measurements of frequencies, percents, and measures of central tendency. Age and total full-time college semesters completed were correlated with the dependent variable, creative thinking ability, using the Pearson Product Moment Correlation.

The dependent and independent variables were analyzed using multiple regression procedures. This statistical technique made it possible to analyze the relationships between the dependent and independent variables. It was possible to "obtain a prediction equation that indicates how scores on the independent and dependent variables could be weighted and summed to obtain the best possible prediction..." (Nie et al., 1975, p. 321). The amount of variation in the dependent variable (creative thinking ability) attributable to perceived stress, self-concept, and perception of creative thinking ability were explored.

Summary

This was a nonexperimental, descriptive, cross-sectional study designed to investigate the relationship between perception of creative thinking ability, self-concept, perceived stress and creative thinking ability of female nursing students. The independent variables studied were perception of creative thinking ability, self-concept, and perceived stress. The perception of creative thinking ability was measured using the Khatena Torrance Creative Perceptions Inventory. Self-concept was measured using the Coopersmith Self-Esteem Inventory, and perceived stress was measured using the Perceived Stress Scale. The dependent variable was creative thinking ability, which was measured by

the Torrance Test of Creative Thinking. The sample was limited to females to control for the spatial differences between males and females (Bock & Kolakowski, 1973; Maccoby & Jacklin, 1974). Total number of full-time college semesters completed and age were evaluated to determine the affect of these variables on the dependent variable.

Recruitment of subjects for the sample occurred in an academic setting. All current rules and regulations regarding the use of human subjects as specified by the Texas Woman's University Human Subjects Review Committee and the committees of the other academic institution were adhered to during the study. The research questions were evaluated with univariate and multiple regression procedures. Demographic information was evaluated using descriptive statistics and used to describe the sample.

CHAPTER IV

ANALYSIS OF DATA

This nonexperimental, descriptive correlational study was conducted to investigate the relationship between creative thinking ability, perception of creative thinking ability, self-concept and perceived stress among female nursing students. The subjects were enrolled in a school of nursing located at a state owned university with an approximate enrollment of 500 upper division students. The information used to describe the sample was obtained via the investigator designed Demographic Data Profile (DDP). The dependent variable, creative thinking ability, was measured using the Torrance Test of Creative Thinking figural form B (TTCT). Findings from the TTCT resulted in a creativity index which served as an overall indicator of creative thinking ability potential.

The creativity index was derived from fourteen pooled creative strength ratings and average standard scores from five individual subscales reported as the creativity profile. The five scores reported in the creativity profile were Fluency, Originality, Abstractness of Titles, Elaboration and Resistance to Premature Closure. The independent variables for this study were perception of creative thinking ability, perceived stress and self-concept. Perception of creative thinking ability was measured using the Khatena Torrance

Creative Perceptions Inventory (KTCPI) which consisted of two tests, What Kind of Person Are You? (WKOPAY), and Something About Myself (SAM). Perceived stress was measured using the Perceived Stress Scale (PSS). Self-concept was measured using the Coopersmith Self-Esteem Inventory, adult form (SEI). Descriptive statistics were used to describe and summarize the data collected on the DDP from the student nurses. The findings from each of the measures used are described and discussed. Inferential statistics were used to determine the relationships between the variables. The chapter concludes with the presentation of the inferential data analysis.

Description of Sample

The sample consisted of 60 female baccalaureate nursing students from a large school of nursing in south-east Texas. The sample included both junior ($n = 32$) and senior ($n = 28$) level students enrolled in the program. The students were randomly selected from enrollment lists, contacted and asked to participate in the study between the months of February and May 1992. Descriptive data from the sample were collected using the demographic data profile and included variables of age, marital status, race, number of full-time semesters of college completed, college degrees, and college level.

The ages of the sample varied from 20 to 42 years with a mean age of 27.75 years ($SD = 6.74$). Thirty-four (56.7%) of the students were 27 years of age or younger and twenty-six (43.3%) were above the mean age. Since the school of nursing where the students were enrolled is an upper

division program, all students would have to be of at least junior standing when entering the program. However, students may have never enrolled as full-time students prior to entering the program. This was the case for at least one (1.7%) of the subjects. Otherwise, the number of full-time semesters completed by the sample varied from 2 to 19, with a mean of 7.2 full-time semesters ($SD = 2.86$) and mode of 7 full-time semesters completed

Thirty-one subjects (51.7%) were single, twenty-three (38.3%) were married, and six (10.0%) were divorced. The sample consisted of 42 (70%) Caucasian, seven (11.7%) black, six (10.0%) Hispanic and five (8.3%) Asian Americans (Table 1).

Twenty percent ($N = 15$) of the sample had previous degrees prior to entering the nursing program. Six (10%) had associate degrees, five (8.3%) had bachelors degrees and one (1.7%) had a medical doctor degree from another country. Two (3.3%) had dental experience, one as an assistant and the other as a hygienist. One subject (1.7%) was a licensed vocational nurse prior to entering the program. Seventy-five percent of the sample did not report previous degrees (Table 1).

Completion of the instruments was accomplished the scheduled time printed in the invitation letter provided to the participants, or at a more convenient, rescheduled time. The subjects completed all of the data collection instruments at the same time. The dependent and independent variables were evaluated for individual descriptive

Table 1
Frequency Distribution and Percentages
of Descriptive Variables

Variable	Frequency	Percent
<u>College Level</u>		
Junior	32	53.4
Senior	<u>28</u>	<u>46.7</u>
Total	60	100.0
<u>Marital Status</u>		
Single	31	51.7
Married	23	38.3
Divorced	<u>6</u>	<u>10.0</u>
Total	60	100.0
<u>Ethnic Group</u>		
Caucasian American	42	70.0
Black American	7	11.7
Hispanic	6	10.0
Asian American	<u>5</u>	<u>8.3</u>
Total	60	100.0
<u>Previous Degrees/Education</u>		
None	45	75.0
LVN	1	1.7
Dental Assistant	1	1.7
Dental Hygienist	1	1.7
Associate Degree	6	10.0
Bachelors Degree	5	8.3
Medical Doctor	<u>1</u>	<u>1.7</u>
Total	60	100.0

characteristics. The ranges, mean, mode, standard deviations and reliabilities are reported below and summarized in Table 2 and Table 6.

Creative Thinking Ability

The creativity index (CI) scores from the TTCT were used as the measure of the dependent variable. The CI is the total score of the TTCT which is a sum of the average standard score and the creative strengths score. The average standard score consists of an average of five norm-referenced standard scores for fluency, originality, abstractness of titles, elaboration, and resistance to premature closure. The creative strengths consists of fourteen criterion-referenced measures for emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines, synthesis of circles, unusual visualization, internal visualization, extending or breaking boundaries, humor, richness of imagery, colorfulness of imagery, and fantasy. The CI scores varied from 91 to 145 ($\mu = 113.7$, $SD = 13.14$). Ten (16.7%) subjects scored at or above 130. These individuals would be considered creatively gifted according to Torrance and Wu (1981). The percentile points, provided in the Norms-Technical manual, for the college aged norm sample was used to place the sample into percentile ranks. Seventeen (28.3%) subjects scored at or above the 75th percentile; 11 (18.3%) scored between the 50th and 75th percentile; 24 (40%) scored between the 25th and 50th percentile; and eight (13.3%) scored below the 25th percentile (Torrance, 1990), (Table 2 & Table 3).

Table 2
Descriptive Characteristics Of
The Dependent Variable

Torrance Test of Creative Thinking, Figural Form B				
Creativity Index (CI)				
Measure	Study N	Sample Value	Adult Norm N	Sample Value
Mean	60	113.72	720	111.63
SD		13.14		16.13
Mode		103.00		-
Range		54.00		75.80
Variability		91-145		69-145

Table 3
Percentile Ranking Of The Creativity Index For
The Torrance Test Of Creative Thinking

Score Range	Frequency	Percent	Percentile
130.0-144.6	10	16.7	Gifted (86th - 99th %tile)
122.9-129.0	7	11.7	High (75th - 85th %tile)
113.2-121.0	11	18.3	Mid High (50th - 74th %tile)
101.2-112.0	24	40.0	Mid Low (25th - 49th %tile)
68.8-101.1	8	13.3	Low (1st - 25th %tile)

Perception of Creative Thinking Ability

Scores on WKOPAY and SAM were used to measure the independent variable of Perception of Creative Thinking Ability. Scores on WKOPAY varied from 15 to 41 ($\mu = 26.28$, $SD = 6.21$) with the most frequent score being 30. The mean for the adult female norm sample was 26.68 ($SD = 5.52$, $N = 2920$), (Table 6). The reliability coefficient alpha for the WKOPAY was $r_{xx} = .7475$ and the Guttman split-half reliability for the instrument was $r_{xx} = .6992$ ($N = 60$). According to Norusis (1990) The Guttman split-half test "does not assume that the two parts are equally reliable or have the same variance" (p. B-193), and therefore, provides a more conservative estimate of reliability.

What Kind of Person Are You produced five factors: Acceptance of Authority, Self-Confidence, Inquisitiveness, Awareness of Others, and Disciplined Imagination. The study sample scored below the adult female norm on Acceptance of Authority ($\mu = 2.66$, $SD = 1.61$, norm $\mu = 4.34$, $SD = 1.84$, $N = 455$) Self-Confidence ($\mu = 6.13$, $SD = 2.06$, norm $\mu = 7.09$, $SD = 1.59$, $N = 455$) and Inquisitiveness ($\mu = 3.40$, $SD = 1.63$, norm $\mu = 3.60$, $SD = 1.24$, $N = 455$). The study sample scored above the adult female norm on Awareness of Others ($\mu = 6.93$, $SD = 1.18$, norm $\mu = 4.94$, $SD = 1.50$, $N = 455$) and Disciplined Imagination ($\mu = 4.88$, $SD = 2.08$, norm $\mu = 4.79$, $SD = 2.28$, $N = 455$), (Table 4).

The technical manual for the instrument did not specify a method of determining relative status of scores such as percentiles. Therefore, the possible total score range was divided into thirds to represent high, mid and low score distributions as done in previous

studies (Khatena & Torrance, 1976). Seven (11.6%) subjects scored in the upper third of the distribution; 48 (80.0%) scored at the middle third; and five (8.3%) scored at the lower third of the distribution. The mean for the WKOPAY norm sample ($\mu = 26.68$) fell approximately at mid-point in the middle third. The mean for the norm sample was .40 greater than the mean for the study sample ($\mu = 26.28$) (Table 6).

The other measure of Perception of Creative Thinking Ability, SAM varied from 15 to 39 ($\mu = 27.6$, $SD = 6.71$) with the most frequent score being 28. The mean for the adult female norm sample was 28.66 ($SD = 7.46$, $N = 849$), (Table 6). The reliability coefficient alpha for the SAM was $r_{xx} = .8167$ and the Guttman split-half reliability for the instrument was $r_{xx} = .8004$ ($N = 60$).

Something About Myself produces six factors: Environmental Sensitivity, Initiative, Self-Strength, Intellectuality, Individuality, and Artistry. The study sample scored above the adult female norm means on Environmental Sensitivity ($\mu = 5.23$, $SD = .91$, norm $\mu = 4.95$, $SD = 1.32$, $N = 483$), Self-Strength ($\mu = 6.15$, $SD = 2.07$, norm $\mu = 5.20$, $SD = 2.15$, $N = 483$), and Individuality ($\mu = 3.77$, $SD = 1.24$, norm $\mu = 3.47$, $SD = 1.27$, $N = 483$). The study sample scored below the adult female norm mean on Initiative ($\mu = 1.08$, $SD = 1.08$, norm $\mu = 1.40$, $SD = 1.38$, $N = 483$), Intellectuality ($\mu = 4.75$, $SD = 2.19$, norm $\mu = 6.38$, $SD = 2.12$, $N = 483$), and Artistry ($\mu = 1.97$, $SD = 1.47$, norm $\mu = 2.57$, $SD = 1.39$, $N = 483$), (Table 5).

Table 4
Means and Standard Deviations For The Five Factors Of
What Kind Of Person Are You For The Study Sample
And Adult Female Norm Sample

Factor Orientation	Study Sample			Adult Female Norm Sample		
	<u>N</u>	μ	<u>SD</u>	<u>N</u>	μ	<u>SD</u>
Acceptance of Authority	60	2.67	1.61	455	4.34	1.84
Self-Confidence		6.13	2.06		7.09	1.59
Inquisitiveness		3.40	1.63		3.60	1.24
Awareness of Others		6.93	1.18		4.94	1.50
Disciplined Imagination		4.88	2.08		4.79	2.28

Table 5
Means and Standard Deviations For The Six Factors Of
Something About Myself For The Study Sample
And Adult Female Norm Sample

Factor Orientation	Study Sample			Adult Female Norm Sample		
	<u>N</u>	μ	<u>SD</u>	<u>N</u>	μ	<u>SD</u>
Environmental Sensitivity	60	5.23	.91	483	4.95	1.32
Initiative		1.08	1.08		1.40	1.38
Self-Strength		6.15	2.07		5.20	2.15
Intellectuality		4.75	2.19		6.38	2.12
Individuality		3.77	1.24		3.47	1.27
Artistry		1.92	1.47		2.57	1.39

Division of the possible total score range into thirds resulted in 13 (21.7%) subjects scoring in the upper third; 42 (70%) subjects scored within the middle third; and five (8.3%) scored in the lower third. The mean for the SAM norm sample ($\mu = 28.66$) fell approximately at the midpoint of the middle third. The mean for the norm sample was 1.06 greater than the mean for the study sample ($\mu = 27.6$), (Table 6).

Self-Concept

Scores on the SEI were used to measure the independent variable of Self-concept. The study sample scores varied from 28 to 100 ($\mu = 77.87$, $SD = 17.65$) and exceeded the mean from the adult norm sample ($\mu = 71.7$, $SD = 18.8$, $N = 148$). High scores on the SEI indicate high self-esteem while low scores indicate low self-esteem. The most frequent score was 84 (Table 6). The reliability coefficient alpha for the SEI was $r_{xx} = .8233$ while the Guttman split-half reliability for the instrument was found to be $r_{xx} = .8686$ ($N = 60$).

The sample raw scores were converted to percentile ranks using the table in the SEI manual. Thirty-four (56.6%) subjects placed above the 66th percentile indicating high self-esteem; nine (15%) placed between the 66th and 33rd percentiles; and 17 (28.3%) placed below the 33rd percentile. The mean for the SEI norm sample ($\mu = 71.7$, $SD = 18.8$, $N = 148$) fell at the 40th percentile, while the mean for the study sample ($\mu = 77.86$, $SD = 17.65$, $N = 60$) fell at the 50th percentile (Table 6).

Perceived Stress

Scores on the PSS were used to measure the independent variable of perceived stress. The scores on the PSS for the study sample varied from 8 to 41. The mean for the sample group ($\mu = 22.05$, $SD = 7.38$, $N = 60$) exceeded the mean for a large adult female norm sample ($\mu = 20.2$, $SD = 7.8$, $N = 1406$) by 1.85. Multiple modes for the study sample were 16 and 24. High scores on the PSS indicate more perceived stress and low scores indicate less perceived stress (Table 6). When reduced to the ten item PSS scale, the scores varied from six to 31 ($\mu = 15.65$, $SD = 5.87$) with multiple modes of 13 and 17. The reliability coefficient alpha for the 14 item PSS was $r_{xx} = .8626$ while the Guttman split-half reliability for the instrument was found to be $r_{xx} = .8477$ ($N = 60$). Since the reliability was higher for the original 14 item form of the PSS, this form was used in the remainder of the calculations.

No method was given in the instrument documentation to divide the scores into a particular distribution such as percentiles. Therefore, the PSS possible score range was divided in to thirds to determine the distribution of scores. Three (5%) subjects scored in the upper third indicating high stress; 39 (65%) subjects scored in the middle third; and 18 (30%) scored in the lower third of the distribution. The sample mean fell in the middle third of the distribution (Table 6).

Table 6
Descriptive Characteristics Of
The Independent Variables

Independent Variable	Study N	Sample Value	Adult N	Norm Value	Score Distribution		
					Level	Freq.	%
What Kind of Person Are You (WKOPAY)							
Mean	60	26.28	2920	26.68			
SD		6.21		5.52	High	7	11.6
Mode		30.00			Mid	48	80.0
Range		26.00			Low	5	8.3
Variability		15 - 41					
Something About Myself (SAM)							
Mean	60	27.60	849	28.66			
SD		6.71		7.46	High	13	21.7
Mode		28.00			Mid	42	70.0
Range		24.00			Low	5	8.3
Variability		15 - 39					
Self-Concept, Coopersmith Self-Esteem Inventory (SEI)							
Mean	60	77.87	148	71.70			
SD		17.65		18.80	High	34	56.6
Mode		84.00			Mid	9	15.0
Range		72.00			Low	17	28.3
Variability		28 - 100					
Perceived Stress Scale (PSS)							
Mean	60	22.05	1406	20.20			
SD		7.38		7.80	High	3	5.0
Mode		16.00			Mid	39	65.0
Range		33.00			Low	18	30.0
Variability		8 - 41					

Findings

This study was conducted to determine the level of creative thinking ability of female student nurses and the relationship between the study variables: creative thinking ability, perception of creative thinking ability, self-concept, and perceived stress. The research questions were answered using mean comparisons between the norms and study means, and the multiple regression procedure with alpha set at $p \leq .05$. The analyses were performed with SPSS/PC descriptive, correlational and regression procedures.

The sample size of 60 with one dependent and four independent variables at the $p \leq .05$ level provided a case to variable ratio of 12 to one which exceeded the recommendation for sample size suggested by Roscoe (1975). Further analysis of the data is explained according to the research questions.

Research Question One

Research question one was: What is the level of creative thinking ability of female nursing students? A comparison was done between the raw scores for the study group and the adult norms for the TTCT. The analysis was broken down into the five individual categories of fluency, originality, abstractness of titles, elaboration, and resistance to premature closure. The norm group for the figural form B was derived from 88,355 records at all age levels. The norm group for the college population consisted of 720 records using figural form B (Torrance,

1990). The comparison of the average score and creativity index was done with standard scores. This comparison is presented in Table 7.

The scoring of the TTCT was done by the Scholastic Testing Service (STS). Scores for the individual categories were reported by STS as raw scores with raw score means and standard deviations. The average score and creativity index were reported as standard scores by STS. The means of the study group ($N = 60$) were closely aligned with the norm means ($N = 720$) with variances of less than three raw points for any category. The norm mean for fluency ($\mu = 18.15$, $SD = 7.10$) was slightly higher than the study group ($\mu = 15.33$, $SD = 6.07$) by 2.82 points. The norm mean for originality ($\mu = 17.26$, $SD = 6.32$) was 2.34 higher than the study group ($\mu = 14.92$, $SD = 6.0$) and the norm mean for elaboration ($\mu = 6.68$, $SD = 2.31$) also exceeded the study group mean ($\mu = 6.17$, $SD = 1.28$) by .51. However, the study group mean for abstractness of titles ($\mu = 10.9$, $SD = 3.62$) exceeded the norm mean ($\mu = 8.92$, $SD = 3.83$) by 1.98, and study group mean for resistance to premature closure ($\mu = 12.33$, $SD = 3.38$) exceeded the norm group ($\mu = 10.77$, $SD = 3.25$) by 1.56.

The group average and creativity index were reported as standard scores by STS. The norm group average ($\mu = 102.39$, $SD = 13.72$) exceeded the study group average ($\mu = 101.72$, $SD = 11.63$) by .67 and the study group creativity index ($\mu = 113.72$, $SD = 13.14$) exceeded the norm group ($\mu = 111.63$, $SD = 16.13$) by 2.09. The creativity index was used as the measure of creative thinking ability for the study group (Table 7).

The placement of the study group ($N = 60$) among national percentile ranks is presented in Table 8. The national percentile ranks were obtained from the Torrance Figural Streamlined Normative Data for Form B, Grade 12+ table (Torrance, 1990, p. 52).

The study group placed above the 50th percentile for abstractness of titles, resistance to premature closure, average, and creativity index. Placement for abstractness of titles was approaching the 75th percentile with a ranking of 70. The study group creativity index ($N = 60$, $\mu = 113.7$, $SD = 13.0$) exceeded the norm creativity index ($N = 720$, $\mu = 111.63$, $SD = 16.13$) by 2.09, or 1.87%.

Research Question Two

Research question two was: What is the relationship between creative thinking ability, and age and number of full-time semesters completed of female nursing students? To determine influence of demographic variables on the dependent variable, correlations between age and number of full time semesters completed, and the TTCT were calculated using Pearson correlation coefficients. The correlations between the TTCT, and age ($r = .0731$, $p = .579$) and number of full time semesters completed ($r = .1808$, $p = .167$) were not significant.

Findings were consistent with the studies reporting that creative thinking ability was not necessarily influenced by age or education (Arieti, 1976; Barron, 1969; Bentley, 1966; Guilford, 1950, 1962, 1971; Owens, 1972; Rhodes, 1961; Taylor, 1968; Thorndike, 1963; Torrance, 1967).

Table 7

Comparison of Means and Standard Deviations for Fluency, Originality, Abstractness of Titles, Elaboration, Resistance To Premature Closure, Average and Creativity Index For The Nursing Student Sample and College Aged Norm Sample

TTCT Component	<u>N</u> 60	Study Sample Mean	<u>SD</u>	<u>N</u> 720	Norm Sample Mean	<u>SD</u>
<u>Raw Scores</u>						
Fluency		15.33	6.07		18.15	7.10
Originality		14.92	6.00		17.26	6.32
Abstractness of Titles		10.90	3.62		8.92	3.83
Elaboration		6.17	1.28		6.68	2.31
Resistance to Premature Closure		12.33	3.38		10.77	3.25
<u>Standard Scores</u>						
Average		101.72	11.63		102.39	13.72
Creativity Index		113.72	13.14		111.63	16.13
Normative data from Torrance (1990).						

Research Question Three

Research question three was: How much of the variance in creative thinking ability is explained by the perception of creative thinking ability, self-concept, and perceived stress of female nursing students? A multiple regression analysis incorporating both stepwise and backward methods was used to answer this research question. The stepwise and backward methods enter data into the regression equation in different

Table 8
National Percentile Ranking Of The TTCT Sub Scales
Of Fluency, Originality, Abstractness of Titles,
Elaboration, Resistance To Premature Closure,
Average And Creativity Index For
The Study Sample

Sub Scale/ Average/ CI	Standard Score Mean	<u>SD</u>	National Percentile
Fluency	94.9	18.1	38
Originality	97.4	18.6	43
Abstractness Of Titles	111.9	17.3	70*
Elaboration	96.2	12.5	41
Resistance To Premature Closure	108.2	19.6	65*
Average	101.7	11.5	53
Creativity Index	113.7	13.0	59
* Interpolated percentile rank from Normative Data Table (Torrance, 1990)			

ways. Both methods were used to ensure thorough analysis of the data. The results from the stepwise and backward multiple regression methods were identical and, therefore, reported together. The means and standard deviations for the variables are presented in Table 9.

The multiple regression analysis equation was significant for the SEI (self-concept) only ($F(1, 60) = 5.538, p = .02$), for the stepwise method. Using this method, the multiple R was .29. The R^2 was .087, indicating that the first step of the equation, which entered the SEI variable, explained approximately 9% of the variability in creative thinking ability. The remaining variables were not entered into the equation by the program. Table 10 shows the stepwise and backward multiple regression analysis summary.

Table 9
Means and Standard Deviations of Variables
in the Multiple Regression Analysis

Variable	Mean	Standard Deviation
<u>Dependent Variable</u>		
TTCT	113.72	13.14
<u>Independent Variables</u>		
WKOPAY	26.28	6.21
SAM	27.60	6.71
PSS	36.05	7.37
SEI	77.86	17.65

The backward multiple regression analysis equation was also significant for the SEI ($F(1, 60) = 5.538, p = .02$). Using the backward method, the multiple R was .295. The R^2 was .087, indicating

that the last step of the equation, which removed all but the SEI (self-concept) variable, explained approximately 9% of the variability in creative thinking ability. All of the other variables were removed from the equation prior to the SEI and were not significant. The summary of the backward multiple regression analysis was identical to the stepwise regression and is presented in Table 10.

Table 10

Multiple Regression Analysis for The Torrance Test
of Creative Thinking, Perceived Stress Scale,
Coopersmith Self-Esteem Inventory, What
Kind of Person Are You?, and
Something About Myself

Multiple Regression Analysis					
	Multiple R			.2952	
	R Square			.0871	
	Standard Error			12.6603	
Analysis of Variance					
Source of Variance	<u>df</u>	SS	MS	<u>F</u>	<u>p</u>
Regression	1	887.75	887.75	5.54	.02
Residual	58	9296.43	160.28		
Total	60	10184.18			

Summary of Findings

In this chapter, the results of the descriptive and inferential statistical analyses were reported. The sample was described according to age, marital status, race, college level, previous degrees, and number of full-time semesters completed. The results of the research questions were given.

The sample consisted of 60 subjects who were female nursing students enrolled in a baccalaureate nursing program. The sample included both junior ($n = 31$) and senior ($n = 29$) students. The mean age of the sample was 27.75 years ($SD = 6.74$) with the most frequent age being 22 years. The majority of the sample was single ($n = 31$, 56.7%) and Caucasian ($n = 42$, 70%).

The subjects had an average of 7.2 full-time semesters completed ($SD = 2.86$). The most frequent number of full-time semesters completed was seven ($n = 15$, 25.0%). The majority of the subjects reported no previous degrees earned ($n = 45$, 75.0%) while the remainder of the sample reported educational preparation ranging from LVN to medical doctor.

Ten of the subjects (16.9%) scored 130 or above on the TTCT which indicated creatively gifted status. The WKOPAY and SAM were the independent measures of the perception of creative thinking ability inventory. The sample was found to have moderate scores on the WKOPAY and scored low on Factor I, Acceptance of Authority, the non-creative orientation factor and high on Factor V, Disciplined Imagination, the

creative orientation factor. The study sample scored moderately on SAM which indicated average perceptions of creative thinking ability. The results for the SEI indicated moderately strong self-esteems, while results of the PSS indicated low to moderate levels of perceived stress for the sample (Table 6). All of the instruments used to measure the independent variables were found to have strong alpha and Guttman split-half reliabilities.

Research question one was evaluated by comparison of the study results on the TTCT with the college aged norms. The study group placed above the 50th percentile for abstractness of titles, resistance to premature closure, average and creativity index (Table 8). The study group mean exceeded the norm mean for the creativity index by 2.09 (Table 7). The Pearson correlation was used to evaluate research question two. Analyses indicated that age and number of full-time semesters completed were not correlated with the dependent variable, creative thinking ability.

Multiple regression analysis was used to evaluate research question three. The analysis indicated that the SEI accounted for approximately 9% of the variance attributed to the dependent variable, the Creativity Index of the TTCT (multiple $R = .2952$, $R^2 = .0871$, $F(1, 60) = 5.5386$, $p = .02$). Both the stepwise and backward multiple regression methods were used in the evaluation, however, the results were identical. All of the other study variables entered into the multiple regression formula failed to produce significant results.

CHAPTER V

SUMMARY OF THE STUDY

The purpose of this study was to investigate the level of creative thinking ability of female nursing students and the relationship between their creative thinking ability, perception of creative thinking ability, self-concept and perceived stress. This last chapter presents a summary of the study, its purpose, research questions, and methodology. Discussion of the findings of the study follow with the conclusions that were drawn from the findings. The chapter concludes with recommendations for further study.

Rogers' (1959) Theory of Personality (TOP) was the theoretical framework for the study. The problem formulated for the study was: What is the relationship between perception of creative thinking ability, self-concept, perceived stress and creative thinking ability of female nursing students? Two research questions were developed based on the problem for the study and the theoretical framework. Since this was a nonexperimental, descriptive correlational study, the first question was necessary to determine the level of creative thinking ability among nursing students. The second question addressed the correlation between the dependent variable and age and number of full-time semesters completed. The third research question addressed the amount of variance

in the dependent variable explained by the independent variables. The research questions were:

1. What is the level of creative thinking ability of female nursing students?
2. What is the relationship between creative thinking ability, and age and number of full-time semesters completed of female nursing students?
3. How much of the variance in creative thinking ability is explained by the perception of creative thinking ability, self-concept, and perceived stress of female nursing students?

As mentioned above, Rogers' (1959) TOP was used as the framework for the study. The theory was appropriate for this study because the variables being studied have been identified as components of the personality. The TOP describes the development of the personality from infancy to adulthood. An inherent feedback system allows the individual to make changes in behavior based on responses from the environment and significant others. Congruence between perception of ideal and actual self allows for enhanced self-concept which provides a positive environment for self-actualization to occur. Self-actualization is realized when the individual has reached the point of being maximally creative. Self-actualization is synonymous with becoming what Rogers described as a fully functioning person.

Self-actualization and the creative thinking process are dynamic entities that change in response to maturation of the individual,

feedback from others, and the environment. Changes in other personality components produce changes in the ability to self-actualize. Some of these components are perception of creative thinking ability, self-esteem, and perceived stress.

The review of the literature defined and explored the creative thinking ability component which is part of the multi-faceted personality structure. Creative thinking ability was defined by Torrance (1974) and the current literature for the college aged population was discussed. The other variables of interest, perception of creative thinking ability, self-concept and perceived stress, were also discussed. The Torrance Test of Creative Thinking, Figural form B (TTCT), What Kind of Person Are You (WKOPAY), Something About Myself (SAM), Coopersmith Self-Esteem Inventory (SEI), and Perceived Stress Scale (PSS), were used to operationalize the concepts for the study.

Summary

The study followed the criteria for a nonexperimental, descriptive, correlational study. Adherence to the criteria for the protection of human subjects was maintained. A random sampling technique was utilized to select the female subjects for the study. The data were collected through the use of five instruments and a demographic data profile. The investigator developed Demographic Data Profile (DDP) provided the demographic data for describing the sample. The TTCT was used to measure creative thinking ability. The Khatena-Torrance Creative Perceptions Inventory (KTCPI) which included

two self-report checklists WKOPAY and SAM provided the perception of creative thinking ability data. The SEI was used to measure self-concept. The PSS provided the measurement of global stress. Instrument completion occurred in a comfortable setting at the school of nursing where the subjects were enrolled. The total time required for the completion of the instruments was approximately one hour. Appointments were made with each subject to allow for participation in the study. The data collection period occurred from February to May 1992.

With the exception of the DDP, each of the instruments used in the study had established reliability and validity as discussed in Chapter 3. Alpha and Guttman split-half reliabilities for this study were reported for the instruments and this sample in Chapter 4.

The instruments were scored by the investigator with the exception of the TTCT. The TTCT was scored by the Scholastic Testing Service (STS). Interrater reliability for the STS was reported in Chapter 3. Results reported by the STS along with the data from the other instruments were evaluated using the Statistical Package for the Social Sciences/Personal Computer version (SPSS/PC).

Discussion of the Findings

The study focused on one dependent variable, creative thinking ability. The independent variables included perception of creative thinking ability, self-concept and perceived stress. Findings of the

study, as described in the previous chapter, are summarized according to the characteristics of the sample and the research questions.

The majority of subjects in this study were single (51.7%), Caucasian females (70%), who were juniors in college (53.4%). The average age was 27.75 years. Enrolled in an upper division school of nursing, the average subject had approximately 7.2 full-time college semesters completed (23.0%), and no previous college degrees (75%).

Creative Thinking Ability

The results of the TTCT were reported as five norm-referenced scores with an average, 14 criterion-referenced measures and the creativity index. The norm-referenced scores were for Fluency, Originality, Abstractness of Titles, Elaboration, and Resistance To Premature Closure. The average score was produced by summing and averaging the five norm-referenced scores.

Each TTCT booklet was also scored on 14 criterion-referenced measures that were summed and reported as a Creative Strengths score. The 14 criterion-referenced measures include: Emotional Expressiveness, Storytelling Articulateness, Movement or Action, Expressiveness of Titles, Synthesis of Incomplete Figures, Synthesis of Lines, Synthesis Circles, Unusual Visualization, Internal Visualization, Extending or Breaking Boundaries, Humor, Richness of Imagery, Colorfulness of Imagery, and Fantasy. The Creativity Index was composed of the Average score and the Creative Strengths score.

Analysis of the results from the TTCT indicated that the sample group scored higher than the college aged norm sample on two of the norm-referenced measures: Abstractness of Titles and Resistance to Premature Closure. These two scores are new norm-referenced measures used in the streamlined scoring procedure. According to Torrance (1990):

Abstractness of Titles is based on the idea that creativity requires one to sense the essence of a problem, to know what is truly essential, and that this is reflected in the level of abstraction given to the titles of the pictures drawn, especially in response to the Picture Construction and Picture Completion activities. It is defended as part of the figural battery on the grounds that it requires the transformation of figural information to another modality. Resistance to Premature Closure as a scoring concept is based on the generally accepted conclusion that creative behavior requires a person to "keep open" in processing information and to consider a variety of information (p. 4).

The sample group scored below the mean on the remaining three norm-referenced measures: Fluency, Originality and Elaboration. According to Torrance (1990) the fluency score "represents the test taker's ability to produce a large number of figural images" (p. 4). The originality score "represents the ability to produce uncommon or unique responses that require creative strength..." (p. 4). The

elaboration score "reflects the subject's ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas" (p. 4).

The average standard score for the TTCT was an average of the five norm-referenced measures (Fluency, Originality, Abstractness Of Titles, Elaboration, And Resistance To Premature Closure). The norm group average score mean was greater than the study group mean by only .67.

The Creativity Index, which is produced by adding the creative strengths score to the average standard score, was higher for the study sample than the college aged norm. The study group CI mean exceeded the norm group mean by 2.09. The CI performance of the study group indicated that the study group was stronger in creative strengths than the norm group. Approximately 17% of the study sample scored at or above 130 which would indicate creative giftedness according to Torrance and Wu (1981).

Perception of Creative Thinking Ability

The two scales from the Khatena-Torrance Creative Perception Inventory (KTCPI) were used to collect data for Perception of Creative Thinking Ability. The two scales are WKOPAY and SAM.

What Kind of Person Are You? Analysis of the results from WKOPAY indicated that the mean for the study group was only slightly lower than the mean of the adult female norm sample. The factor scores for the study sample for Acceptance of Authority, Self-Confidence, and Inquisitiveness were lower than the adult female norm. The factor scores for the study sample were higher for Awareness of Others and

Disciplined Imagination than the adult female norm. Factor analysis from previous research by Bledsoe and Khatena (1974); and Khatena and Torrance (1976) indicated that Factor I, Acceptance of Authority was found to have a non-creative orientation, while Factor V, Disciplined Imagination was found to have a creative orientation. Factors II through IV were found to have both creative and non-creative orientations. The low mean for Acceptance of Authority and high mean for Disciplined Imagination would indicate the study sample perceived their orientation as creative.

Factor I - Acceptance of Authority includes "being obedient, courteous, and conforming and to accepting the judgments of authorities." In contrast, Factor V - Disciplined Imagination involves "being energetic, persistent, thorough, industrious, imaginative, adventurous, and never bored, attempting difficult tasks and preferring complex tasks" (Khatena & Torrance, 1976, p. 18-19).

It could be suggested that the nursing students in the study sample were non-conforming and resisting authority. At the same time they were exhibiting positive qualities of persistence, energy, imagination and willingness to embrace challenge.

Something About Myself. Analysis of the results from SAM indicate that the study sample mean was lower than the female adult norm group mean. Factor scores for the study sample for Environmental Sensitivity, Self-Strength, and Individuality were higher than the female adult norm group. Factor scores for the study sample for Initiative,

Intellectuality, and Artistry were lower than the adult female norm sample. Previous research by Bledsoe and Khatena (1973); and Khatena and Torrance (1976) provided interpretation for the factors of SAM:

Factor I - Environmental Sensitivity: ...openness to ideas of others; relating ideas to what can be seen, touched, or heard; interest in beautiful and humorous aspects of experiences; and sensitivity to meaningful relations.

Factor II - Initiative: ...directing, producing, and/or playing leads in dramatic and musical productions; producing new formulas or new products; and bringing about changes in procedures or organization.

Factor III - Self-Strength: ...self-confidence in matching talents against others; resourcefulness; versatility; willingness to take risks; desire to excel; and organizational ability.

Factor IV - Intellectuality: ...intellectual curiosity; enjoyment of challenging tasks; imagination; preference for adventure over routine; liking for reconstruction of things and ideas to form something different; and dislike for doing things in a prescribed routine.

Factor V - Individuality: ...preference for working by oneself rather than in a group; seeing oneself as a self-starter and somewhat eccentric; critical of others' work; thinking for oneself; working for long periods without getting tired.

Factor VI - Artistry: ...production of objects, models, painting, carvings; musical compositions; awarding of prizes or having exhibits; production of stories, plays, poems, and other literary pieces (Bledsoe & Khatena, 1973, p. 1177).

An argument could be made that the nursing students were open to experience and ideas of others, self-confident, resourceful and willing to take risks. At the same time they perceived themselves to be self-starters, critical of the work of others and independent.

Self-Concept

Self-concept as measured by the SEI appeared to be fairly high for the study sample. Previous research by Coopersmith (1991) indicated that individuals with high self-concept were capable of maintaining enduring perceptions of their abilities and their individualism. Other studies suggested that incongruity between personal aspirations and performance cause some individuals to view themselves as inadequate regardless of their successes (Rogers, 1951, 1959). Other studies identified failure and other experiences that threaten to reveal personal shortcomings as being probable causes of anxiety, and therefore threats to the individual's self-concept (Rogers, 1951; Torrance, 1954; Wylie, 1961). Ahmed, Valliant and Swindle (1985) identified a negative correlation between self-esteem and guilt and anxiety. Fleming and Watts (1980) found significant negative correlations between the self-esteem factor of social confidence and external locus of control, and situational anxiety. Correlations between the self-esteem factor,

school abilities, and verbal intelligence were positive, however the factor correlated negatively with need for approval and situational anxiety. Significant correlations were also found between the self-regard factor and external locus of control, and situational anxiety

Analysis of the results from the SEI indicate that the mean for the study group exceeded the adult norm mean by 6.17. Coopersmith (1991) indicated that scores falling in the relative positions of the upper quartile for the scale were indicative of high self-esteem, the interquartile range was generally indicative of medium self-esteem and the lower quartile was indicative of low self-esteem. The majority of the study sample scored in the upper third of the distribution. However, 28% scored in the lower third of the distribution.

The relatively high scoring of the study sample would indicate that the group had, according to the definition by Coopersmith, approval and belief in self, belief of self to be capable, significant, successful and worthy. The success of study sample in a baccalaureate nursing program would be one validating comparison for the scores.

Perceived Stress

The association between global stress and increased vulnerability to the risk of stress induced physical and psychological symptoms; compliance with treatment regimes; and depressive symptoms have been identified by Cohen and Williamson (1988). The PSS, designed to identify an individuals' perception of the extent to which coping

ability is exceeded by environmental demands, was used to assess perceived stress in this study. Previous studies by Cohen, Kamarck, and Mermelstein (1983); and Cohen and Williamson (1988) indicated that higher levels of perceived stress were associated with the following characteristics or circumstances: young individuals; low income status; ethnic minorities; women; low education levels; more than two persons in the household; single, never married or divorced; employment status of part time, student, and unemployment or disabled/too ill to work.

Analysis of the results of the PSS indicate that the mean for the study sample of nursing students exceeded the adult female norm mean by 1.85. The nursing student sample mean exceeded the norm means for their age group, education level, all races, and all marital status designations with the exception of separated. The study sample mean was .55 below the employment mean designated student. The nursing student sample fell into more than one of the classifications for increased stress. According to the findings, the study sample was perceiving life as stressful. Increased perceived stress would increase vulnerability to stress induced physical and psychological symptoms and may impact compliance with treatment regimes.

Research Question One

Comparative analysis was used to answer research question one: What is the level of creative thinking ability of female nursing students? The norm means exceeded the study group means for fluency, originality, elaboration and the average score. According to Torrance

(1990) the fluency score "represents the test taker's ability to produce a large number of figural images" (p. 4). The originality score "represents the ability to produce uncommon or unique responses that require creative strength..." (p. 4). The elaboration score "reflects the subject's ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas" (p. 4).

Ventura and Meyers (1976) and Ventura (1979) reported diploma nursing students scored higher on figural fluency and flexibility than did associate and baccalaureate students. Associate students scored higher on elaboration than baccalaureate and diploma students. Since the time of the Ventura and Meyers, and Ventura studies, the scoring process for the TTCT has been changed. The current method of scoring is the streamlined scoring that has eliminated flexibility and has added abstractness of titles and resistance to premature closure.

Sullivan (1987) found that the creativity index was higher upon entry ($\bar{X} = 114$) to the program than at exit ($\bar{X} = 107$). Sullivan also found that fluency was not altered by the education process; flexibility was higher at the end of the program than at the beginning; and originality was slightly lower at the end of the program than at the beginning.

The current study was a descriptive study with one time data collection. The study sample mean for this study was 113.72 which is equivalent to the entry mean reported by Sullivan. However, the study sample means for this study exceeded the means reported by Sullivan

(1987) for beginning and ending measures for originality by 18 and 32 standard points respectively; and were lower than the fluency scores by 12 and 19 standard points respectively. It must be kept in mind that the scoring format was changed to the streamlined scoring between the time of the study by Sullivan and the current study which could account for some of the difference in scores.

Bailey, McDonald and Claus (1970), used the TTCT figural form also, however, the scoring method has been changed to the streamlined scoring format since their study. They did find that figural fluency was the only measure to change from one curriculum implementation to another. The other figural measures, flexibility, originality and elaboration did not change significantly.

The current study group scored higher than the norm sample on the abstractness of titles and resistance to premature closure. It could be argued that the creative thinking abilities required during the abstractness of titles and resistance to premature closure activities are abilities needed by both female nursing students and RNs to make decisions during day to day patient care. The ability to "sense the essence of the problem, to know what is truly essential" are necessary and important qualities of a nurse for the purposes of assessment, planning, implementation, and evaluation. The ability to "keep open" during problem solving is also a necessary skill used by the nurse to evaluate the patient situation on a continuing basis, to make adjustments in patient care when deemed appropriate.

The average standard score for the TTCT was an average of the five norm referenced measures (fluency, originality, abstractness of titles, elaboration, and resistance to premature closure). The norm group average standard score mean was greater than the study group mean by only .67.

The Creativity Index was produced by adding the creative strengths, which are criterion-referenced measures, to the average standard score. The fourteen creative strengths are emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles, synthesis of incomplete figures, synthesis of lines, synthesis of circles, unusual visualization, internal visualization, extending or breaking boundaries, humor, richness of imagery, colorfulness of imagery, and fantasy (Torrance, 1990). The study group CI mean exceeded the norm group mean by 2.09.

The CI performance of the study group indicated that the study group was stronger in creative strengths than the norm group. Each of the creative strengths are important and crucial abilities for a nurse. They allow the nurse to move through the components of the nursing process in a comprehensive manner without loss of compassion for the patient or the unique personality characteristics of the nurse.

Aichlmayr (1969), Demetrulias and Shaw (1985), and Sullivan (1987) identified the need for nurses who think creatively to cope with rapidly changing medical technology, scarce and expensive health-care resources, expansion of health services both in the hospital and the community.

Dealing with complex patient and nursing problems, professional collegial relationships, new and expanding roles, and development of nursing theory and research also demand that nurses possess creative thinking abilities.

Stepp-Gilbert and Wong (1985) identified the nursing process as an integral part of nursing curricula which necessitates divergent and creative thinking ability by the nurse. The instinctual awareness of the substance of problems, and the ability to resist premature closure on problems are essential to the nurse and the implementation of the nursing process.

Research Question Two

The Pearson Product Moment correlation was used to evaluate research question two: What is the relationship between creative thinking ability, and age and number of full-time semesters completed of female nursing students? The interval level demographic variables, age and number of full time semesters completed, were evaluated using the Pearson correlation to explain the relationship to the dependent variable. Neither age nor number of full time semesters completed correlated significantly with the CI of the TTCT. This finding is consistent with studies in the literature that found creative thinking ability was not necessarily related to or associated with age or education (Arieti, 1976; Barron, 1969; Bentley, 1966; Guilford, 1950, 1962, 1971; Owens, 1972; Rhodes, 1961; Taylor, 1968; Thorndike, 1963; Torrance 1967).

Research Question Three

Multiple regression was used to evaluate the data and answer research question three: How much of the variance in creative thinking ability is explained by the perception of creative thinking ability, self-concept and perceived stress of female nursing students? Both multiple regression analysis methods of stepwise and backward were used to ensure thorough analysis of the data. Findings indicated that the SEI was the only independent variable entered into the stepwise equation and the last and only significant variable left in the backward regression equation. Perception of creative thinking ability as measured by the WKOPAY and SAM, and perceived stress as measured by the PSS were not significant variables in the multiple regression equation. The results for multiple R and R^2 by both methods were identical. The SEI, therefore, explained approximately 9% of the variability in creative thinking ability leaving approximately 91% of the variability unaccounted for.

The studies reviewed in the literature did not have the same type of methodology as the current study. This fact identified the need for a descriptive correlational study to explain the relationship between the variables creative thinking ability, perception of creative thinking ability, self-concept, and perceived stress.

The small amount of variance in the dependent variable attributable to the independent variables could possibly be explained by the sample size which may have influenced the outcome of the statistical procedures. Although the sample size used in this study exceeded the

minimum for a multiple regression recommended by Roscoe (1975), a larger sample may have produced different results.

Another factor that may have contributed to the lack of results from the multiple regression is the multifaceted nature of creative thinking ability. The measures available at this time to investigate components of the personality may not be sensitive enough to measure the individual characteristics that contribute to creative thinking ability. As identified by Guilford (1950) specific, individual characteristics include "sensitivity to problems", "fluency", "novel ideas", "flexibility", "synthesizing ability", "analyzing ability", "reorganization or redefinition", "degree of complexity", and "evaluation" (p. 451-453). These characteristics are intangible and perhaps overlapping making them difficult to measure.

Another possible explanation could be associated with one of the problems identified by Shavelson, Hubner, and Stanton (1976) regarding the investigation of the self-concept. The nature of most psychological measurements, which are generally subjective, self-report, and/or autobiographical scales, rely on the honesty of the subject to indicate accurate responses. Several investigators have reported skepticism in the ability of subjects to be objective when answering psychological measures (Cronbach, 1970; Crowne & Stephens, 1961; Shavelson, Hubner, & Stanton, 1976; Snygg & Combs, 1949). Participants in the study may have selected the more desirable, rather than the most accurate options on

the self-report measures. The WKOPAY, SAM, SEI, and PSS are all self-report checklists or scales.

Conclusions

Based on the findings of this study, some conclusions can be made regarding the creative thinking ability of women in nursing. The conclusions are as follows:

1. Female nursing students possess adequate levels of creative thinking ability compared to the adult female norms.
2. Female nursing students' levels of self-concept are average or above. The narrow variability of scores among the measures may be accounted for by the fact that the participants in the study sample were successful in the educational process and life experiences.
3. Age and amount of education do not contribute to nor detract from creative thinking ability of female student nurses.
4. Female nursing students generally perceive life as stressful.

Implications

The implications that may be inferred from the results of this study are indicated as follows:

1. Activities to promote creative thinking ability by the students should be considered throughout the curriculum. Creative thinking ability includes the ability to "sense the essence of a problem, to know what is truly essential" and to be able to "keep open"

in processing information and to consider a variety of information" (Torrance, 1990, p. 4). These are important qualities to promote in nurses. These abilities are essential for the identification, clarification, and resolution of problems by nurses through the use of the nursing process.

2. Since self-concept was the only independent variable to explain variance in the dependent variable, positive professional and personal self-concepts should be promoted in the curriculum and by faculty. Appropriate activities that are challenging and increase in difficulty as the knowledge base of the student increases, would provide challenge as well as positive reinforcement. Emphasis on student autonomy and responsibility for learning in the academic and clinical settings with faculty as facilitators should also provide positive reinforcement for successful, self-reliant behaviors.

3. Due to the high mean for the nursing student sample on the PSS, encouragement of students to seek guidance and counseling for stressful situations is appropriate. Interventions that assist the individual to gain control over stressors and strengthen coping mechanisms may be effective methods of dealing with stressful situations and lessening the effects of stress. Decreasing stress in the lives of nursing students will decrease the distractions associated with stress and allow for effortless creative thinking activity.

Recommendations For Further Study

Further research is needed to test the Theory of Personality with regard to the relationships between creative thinking ability, perception of creative thinking ability, self-concept, and perceived stress in nursing populations. To further enhance the body of knowledge of nursing and nursing education, the following recommendations derived from this study are suggested:

1. This study should be replicated using the same theoretical framework, study design, a larger sample, and a more varied population of students to enhance the power of the statistical procedures and the ability to generalize the results.
2. Measurement of creative thinking ability and self-concept upon entrance to and exit from the nursing program should be done to determine the relationship between the total educational experience, creative thinking ability and self-concept.
3. Additional study related to creative thinking ability and self-concept should be considered. An experimental study with activities to improve creative thinking ability and maintain self-concept would help to clarify the relationship between creative thinking ability and self-concept.
4. Finally, it is recommended that a study comparing the levels of creative thinking ability in students and practicing nurses as well as RNs with varying degrees of education would be indicated to determine

the relationships of education and experience on the development of creative thinking ability and self-concept.

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APPENDIX A
Perceived Stress Scale

Subject ID #

PERCEIVED STRESS SCALE

S. Cohen, T. Kamarck, & R. Mermelstein

INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. Answer each question fairly quickly. Don't try to count up the number of times you felt a particular way but rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives: Never, almost never, sometimes, fairly often, very often. Circle the appropriate number.

	Never	Almost Never	Some Times	Fairly Often	Very Often
In the last month have you:					
1. been upset because of something that happened unexpectedly:	0		2	3	4
2. felt that you were unable to control the important things in your life:	0		2	3	4
3. felt nervous and "stressed"	0		2	3	4
4. dealt successfully with life hassles?	0		2	3	4
5. felt that you were effectively coping with important changes that were occurring in your life?	0		2	3	4

(Cont.)

	Never	Almost Never	Some Times	Fairly Often	Very Often
In the last month have you:					
6. felt confident about your ability to handle your personal problems?	0		2	3	4
7. felt that things were going your way?	0		2	3	4
8. found that you could not cope with all the things that you had to do?	0		2	3	4
9. been able to control irritations in your life?	0		2	3	4
10. felt that you were on top of things?	0		2	3	4
11. been angered because of things that happened that were outside of your control?	0		2	3	4
12. found yourself thinking about things that you have to accomplish?	0		2	3	4
13. been able to control the way you spend your time?	0		2	3	4
14. felt difficulties were piling up so high that you could not overcome them?	0		2	3	4

APPENDIX B
Demographic Data Profile

DEMOGRAPHIC DATA PROFILE

- (1) Age: _____
- (2) Marital status:
1. single, never married _____
 2. divorced _____
 3. widowed _____
 4. married _____
 5. single, living with
significant other _____
- (3) Race:
1. Anglo-American _____
 2. Black-American _____
 3. Mexican-American _____
 4. Asian or Asian American _____
 5. Other, please specify _____
- (4) Number of full time semesters of college completed
(do not count current semester) _____
- (5) College Degrees completed if any: _____
-
- (6) College level:
1. junior _____
 2. senior _____
 3. other _____

APPENDIX C
Invitation Letter

Invitation Letter

Dear Student,

You have been randomly selected from your class to participate in a research study titled, Creative Thinking Ability of Women In Nursing. The study is designed to investigate the relationship between students' perception of creative thinking ability, self-concept, perceived stress and creative thinking ability.

A written description of the study is attached to this letter. If you decide to participate, please meet me in room 1.424, School of Nursing/School of Allied Health building, at 2:00 P. M. on January 25, 1992 to participate in the study.

If you would like to participate but cannot meet at the scheduled time, please contact me at (409) 772-8221 before January 25th and another time will be scheduled.

Thank you for your time and interest.

Sincerely,

Trish Richard, R.N.C.S., M.S.N.
Doctoral Student, Nursing
Texas Woman's University, Houston Campus

APPENDIX D
Agency Approval

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

HUMAN SUBJECTS REVIEW COMMITTEE - HOUSTON CENTER

EXEMPT FROM HSRC REVIEW

If it is the decision of the research committee (for student research) or the department coordinator (for faculty research) that the proposed research is exempt from expedited or full review by the Human Subjects Review Committee (HSRC), please complete the following form. A copy of this properly signed form must be submitted to the chairman of the HSRC.

Principal investigator: Patricia L. Richard
Social Security Number: 419-66-2693
Title of the Research: Creative Thinking Ability of Women in Nursing

1. Give a brief description of the study (use continuation pages or attachments, if necessary). Describe the procedure that relates to the subjects' participation, i.e., what will the subjects do or what will be done to them.

This study is designed to investigate the creative thinking abilities of women in nursing. In addition, the relationship perception of creative thinking ability, self-concept, and perceived stress have on creative thinking ability will be studied. (cont. on attached sheet)

2. What are the potential risks to the human subjects involved in this research or investigation (use continuation pages if necessary)?

Subjects may experience some anxiety or concerns while completing questionnaires, otherwise, no risks are anticipated.

3. Is research being conducted for a nonuniversity sponsor? Yes _____ No X

Name of sponsor: _____

I certify that this research meets the requirements for being exempt from review by the HSRC as specified in the Human Subjects Program Guideline (March 1986, revised). Three committee members sign for proposal or thesis, and all committee members sign for the dissertation research.

Diane Gogdale Chairman, research committee, Date 2/2/92
James Robert committee member
Carolyn M. Allen committee member
_____ committee member

or, in the case of faculty research

_____ Department Coordinator, Date _____

Department _____

Date received by HSRC Chairman _____ Initials _____

The University of Texas Medical Branch at Galveston



School of Medicine
Graduate School of Biomedical Sciences
School of Allied Health Sciences
School of Nursing

Marine Biomedical Institute
Institute for the Medical Humanities
UTMB Hospitals

Office of
Sponsored Programs—Academic

January 17, 1992

M E M O R A N D U M

TO: Patricia L. Richard, M.S.N.
Assistant Professor
School of Nursing J29
E. Ray Stinson
FROM: E. Ray Stinson, Ph.D.
Director of Sponsored Programs-Academic

SUBJECT: Expedited Review, Human Subjects

Project Director: Patricia L. Richard, M.S.N. OSP #92-47
Project Title: "Creative Thinking Ability of Women in Nursing"

Under the Institutional Review Board's mechanism for reviewing minimal risk protocols, your project referenced above has been approved on January 17, 1992. I am, therefore, pleased to inform you that you may proceed with this project, effective immediately.

Project Directors of approved projects are responsible for reporting to the Institutional Review Board any unanticipated adverse reactions observed during the conduct of the project as well as any severe or serious side effects whether anticipated or unanticipated.

Should your project require modification which alters the risk to the subject or the method of obtaining informed consent, the project must be reevaluated by the Institutional Review Board before the modification is initiated.

Completed subject consents should be maintained in the designated place for at least three years after the termination of the project. In order to be in compliance with the requirements of the FDA regulations, 21 CFR 56.27a, a copy of the completed consent document must be provided to the subject.

COMMENTS: This project is limited to the use of anonymous questionnaires and psychological tests and the return of the completed questionnaires and tests imply consent.

ERS/nh

xc: Dr. Jerry Lester
Acting Associate Dean for Research
School of Nursing J29