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## Rural-Urban Student Differences on the Strong Interest Inventory for a Career Counseling Center Sample

Susan L. Pauly

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RURAL-URBAN STUDENT DIFFERENCES  
ON THE STRONG INTEREST INVENTORY  
FOR A CAREER COUNSELING CENTER SAMPLE

by

Susan L. Pauly  
Master of Arts, University of North Dakota, 1992

A Dissertation

Submitted to the Graduate Faculty  
of the University of North Dakota  
in partial fulfillment of the requirements  
for the degree of  
Doctor of Philosophy

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1996

This dissertation, submitted by Susan L. Pauly in partial fulfillment of the requirements for the Degree of Doctorate of Philosophy from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

Dennis L. Loefer  
(Chairperson)

Gene A. Loefer

Charles R. Barker

J. M. Loefer

Jan C. Oberpriller

This dissertation meets the standards for appearance, conforms to the style and format requirements of the Graduate School of the University of North Dakota, and is hereby approved.

Harvey Kneel  
Dean of the Graduate School

11-21-96  
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### PERMISSION

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## ABSTRACT

The purpose of this study was to explore whether differences existed between rural and urban students' responses on the Strong Interest Inventory (SII). The subjects for this study were 665 students who had taken the SII as part of career counseling services received at the University of North Dakota. The subjects were classified as either rural or urban based on the population of their hometown. The rural and urban groups' scores were compared on the SII General Occupational Theme (RIASEC), Academic Comfort and Introversion/Extroversion scales, the Iachan index of congruence between RIASEC scores and college major, measures of indifference in responding, and profile differentiation. No mean differences between rural and urban subjects were detected on any of the comparisons. The study also examined whether cumulative grade point average (GPA) could be predicted by factors including Academic Comfort, gender, being from a rural/urban environment, and ACT composite scores. Results indicated that when ACT scores are included in the prediction equation, the effects of rural/urban disappear. Rural-urban status and gender were not found to moderate the relationship between Academic Comfort scores and GPA.



## CHAPTER 1

### Introduction

As part of graduate training, I was privileged to work as an individual career counselor at the University of North Dakota Counseling Center. In that role, I worked with many career clients and interpreted a number of Strong Interest Inventories (SII). Over the course of this time, I began to notice some trends in the students' scores on the SII which are of interest to me, and I believe, also, to the psychological community.

While conducting vocational interviews and interpreting SII's, I observed that students from rural areas tended to have lower scores on the SII Academic Comfort (AC) scale than did those from larger, urban areas. Also, I noticed that rural students tended to respond with a higher percentage of "dislike" than either "indifferent" or "like" responses to the SII items, especially items in the areas of occupations and school subjects. This resulted in SII profiles with low scores on the General Occupational Themes (GOTs) and no significant differences between the six GOT scores. For interpretative purposes, this low, undifferentiated profile is problematic because it means that the test-taker's personality pattern, as identified by their three highest GOT scores, cannot be clearly delineated. Therefore, the number of occupations that match the person's pattern is reduced. Stated in practical terms, this means that when a student takes the SII to help them identify careers which match with their interests, and the end result is a low,



undifferentiated profile, the student is often disappointed to find few career matches for consideration.

There are a number of reasons why rural students obtain flat SII profiles. Perhaps rural students genuinely dislike many of the occupations and school subjects represented in the SII questions, and the profile correctly reflects their lack of interests. Alternatively, rural settings may not give students enough exposure to different occupations, school subjects and leisure activities to permit them to respond knowledgeably to many of the items. In the latter instance, the SII must be interpreted differently for rural students, something of which career counselors should be made aware.

The SII is one of the most widely used vocational assessment instruments (Hansen, 1992). Its applicability has been studied for many populations. One for which it has not been studied is the rural population. No references were found for any research exploring the use of the SII for rural individuals. Therefore, it is the intent of this study to explore whether rural and urban students respond differently on the SII.

## CHAPTER 2

### Review of the Literature

The review begins with a definition of interests and their relation to occupational choice. Next, theories about the development of occupational interests and stereotypes are considered, as these are the foundation upon which career interest inventories rest. The history and structure of the SII, and its use with college populations, is discussed next. Because those from rural populations may be considered as a minority group, literature on the use of the SII with minority and ethnic groups is also reviewed. Finally, a review of research on career concerns for rural populations is presented.

#### Definition of Occupational Interests

In order to understand how vocational interests develop, it is important to have some understanding about what the word “interest” means in relation to occupational choice. Super (1957) delineated four types of interests. He defined “expressed interests” as expressions of preference for a vocation or activity. The SII, then, measures expressed interests because it requires test-takers to indicate their preferences for school subjects, leisure activities, and occupations. Super (1957) also believed that interests could be inferred from our actions as evidenced by participation in activities. These interests he called “manifest interests”. He also stated that interests could be measured in two ways. When a scoring algorithm is used to estimate interests based on individual responses

regarding the person's likes, dislikes and preferences for one activity versus another (expressed interests), Super called them "inventoried interests." Therefore, Super would suggest that the interests measured by scores on the SII scales are inventoried interests. He also believed that manifest interests could be measured under controlled conditions, such as the amount of time spent examining resources for specific careers. He called these interests "tested interests". Super (1957) further stated that there are six categories within each of these types of interests. He classified them as: (a) scientific, technical or material; (b) humanistic or social welfare; (c) systematic or business detail; (d) business contact; (e) literary; and (f) musical/artistic.

Dawis and Loftquist (1984) defined interests in a manner similar to Super (1957). They believed that interests stem from underlying values and abilities. They suggested that there is a complex relationship between our values and abilities and that we strive to express this relationship in a variety of ways. One expression of the relationship of values and abilities is through the statement of preferences for various activities. For example, an individual might say, "I like to read books." According to Dawis and Loftquist (1984), this preference is termed an "expressed or stated interest." At times, we may want to create an instrument which inquires about preferences for a comprehensive sample of activities that have been experienced by a majority of people. When an individual responds to such an instrument (e.g., the SII), their scored responses are termed "measured interests" (p. 18, Dawis & Loftquist, 1984). Dawis and Loftquist (1984) also referred to preferences for activities which may be observed by others through our participation in the activity. They call this "exhibited interest" and state that congruence



between these exhibited interests and measured interest is called "validated interest" (p. 19, Dawis & Loftquist, 1984).

Although Holland's (1985) description of interests is similar to those of Super (1957) and Dawis and Loftquist (1984), his definition places more emphasis on interests as a manifestation of personality. He stated that preferences for activities are based on an interplay of personal and environmental forces such as heredity, peers, family, social class, culture, and the physical environment. These activity preferences develop into specific interests which, over time, cause a person to develop special competencies. Holland (1985) believed that the combination of interests and competencies creates a personal disposition which leads an individual to think and respond in characteristic ways. He called this their personality type. The six pure personality types Holland defined (Realistic, Investigative, Artistic, Social, Enterprising and Conventional) are remarkably similar to the interest classifications noted by Super (1957). Therefore, Holland (1985) saw interests and personality type as essentially equivalent constructs.

Knowledge of how interests are defined and how they relate to personality is important to understanding the structure and meaning of the SII. Essentially, the instrument is based on the assumption that an individual has preferences or expressed interests in activities, school subjects, working with certain types of people and in certain occupations. The test is also based on the idea that these expressed interests, when compiled permit inferences about basic interest or personality types which can be used to classify both the individual expressing them and the environment in which the individual works. Ultimately, the scores obtained from the SII are inventoried interests that measure

what Holland calls personality type. These scores are then used to help match the person with congruent occupations. Essentially, then, the ideas of Super (1957), Holland (1973, 1985) and Dawis and Loftquist (1984) help explain how the SII works, and why it is successful.

### Models of Vocational Interest Development

In addition to understanding how interests are defined, it is also important to understand how career interests develop. Many theories have emerged about career and interest development. The major theories for consideration may be classified as developmental, personality, social learning, and valence instrumentality models.

Developmental Career Theories. Super's (1953, 1957, 1980) theory is called developmental because it considers career decision making across the life-span. Super (1957) based his theory on twelve propositions. In the first three, he stated that the process of vocational development was ongoing, irreversible, orderly, predictable, and dynamic. Super (1980) specified the orderly stages of the process as growth, exploration, establishment, maintenance, and decline. He described the growth stage as occurring until about age fifteen and one in which the focus is on physical and psychological development as well as acquiring experiences which will give background knowledge about the environment, including the world of work (Super, 1957). The exploration stage may last until the individual is around twenty-five years of age and starts with the realization that work is a part of life. In this stage, many choices are fantasized about, but the range of choices is eventually narrowed down to only those realistically attainable. The establishment phase is typified by initial work experiences and attempts to access



earlier vocational decisions. During the maintenance phase, which lasts until about age sixty-five, the individual continues to enhance the vocational situation by adjusting both pleasant and unpleasant aspects of the job. The declining phase begins prior to retirement and focuses on meeting work standards and simply retaining the job till retirement (Super, 1957).

In proposition four, Super (1957) introduced the notion of self-concept formation. Definition of a clear self concept is the primary task in career development. It is the self concept which must be translated into occupational terms before it can be implemented in a career choice. This idea is considered to be the central tenet of Super's developmental theory. In propositions five and six, Super (1957) suggested that personal and societal reality factors, including the parental relationship, have increasingly profound effects on occupational choice. Super (1957) also stated in propositions seven and eight that vocational choice is affected by intelligence, SES, needs for status, values, interests, interpersonal skills, education, economic supply and demand, role models, and available community resources. In proposition nine, Super (1957) spoke to the work environment requirements for specific skills, abilities, and interests. Propositions ten and eleven referred to work satisfaction as a function of the congruence between the individual's interests, abilities, values and personality traits and those provided by the work environment. Furthermore, the degree of satisfaction is measured by the degree to which self-concept is implemented in the workplace. Finally, in proposition twelve, Super (1957) suggested that work is an expression of personality.

Super (1980) also believed that across the life-span, there are a variety of roles that an individual plays. He described the life roles as child, student, leisurite, citizen, worker, spouse, homemaker, parent and pensioner. He believed these roles are carried out in four theaters which he labeled, the home, the community, the school, and the workplace. He integrated the concepts of life stages, roles, and theaters in a graphic representation he called the Life-Career Rainbow (Super, 1980). He added to this the concept of decision points which he believed occurred at times of transition between roles. At these decision points, choices are affected by the interaction of all personal and environmental forces (Super, 1980). Ultimately, Super (1957) viewed the development of occupational interests as an interplay between personal and environmental determinants, and the developmental goal as the implementation of the self-concept.

Gottfredson (1981) also proposed a developmental theory of career choice. She believed this development is highly influenced by social environment as well as cognitive development. According to Gottfredson, the most relevant influences on career development are gender, social class, intelligence, values, competencies and interests. Her theory stated that these elements become a part of individual self-concept at different stages of cognitive development.

Gottfredson's (1981) four stage theory begins with the "orientation to size and power" which occurs at ages three to five. In this stage, children are first able to understand the concept of being an adult someday. In the next stage, "orientation to sex roles," children confirm the concept of gender. This stage occurs at about six to eight years of age. At age nine to thirteen, children enter the stage of "orientation to social valuation" where the



concepts of social class and ability become important influences on social expectations and behavior. The final stage of development is called "orientation to the internal, unique self" and typically begins at about age thirteen. Here, adolescents are increasingly able to deal with emotional stress as well as more abstract and complex cognitive tasks. Also, teens in this stage are more aware of their own inner feelings and personal capabilities (Gottfredson, 1981).

In practical terms, Gottfredson (1981) postulated the following developmental progression. The preschool child has a fairly positive view of the occupations in his/her awareness; this view is modified first by ruling out those jobs which are incongruent with gender role, and later by eliminating occupations which do not meet requirements for status and prestige or that exceed requirements for individual effort. Finally, in adolescence, individuals begin to consider personal capabilities, interests and values as they further restrict the range of career choices. This narrowing of choices is also affected by environmental opportunities and barriers. Gottfredson (1981) maintained that the choice of career is a compromise between the fulfillment of adolescent dreams and the reality of barriers to employment. She maintained that the pattern of compromise will begin with sacrificing vocational interests first, followed by job level, and then sex type.

Poole and Cooney (1985) proposed a model of career decision-making based on personal possibility theory. While their theory is not strictly a developmental theory, it contains elements similar to Super's notion of self concept and Gottfredson's ideas about concepts related to career choice. They argued that at each stage of individual development, people are faced with a huge range of choice possibilities. Internal

cognitive structures then affect the possibilities by screening, organizing and creating experiences (Poole & Cooney, 1985). Therefore, to exercise choice, a person must have an awareness of available options. The researchers then postulated that occupational perceptions may be influenced by their environments (Poole & Cooney, 1985).

Specifically, they examined whether sex, social class and ethnicity affected the awareness of occupational possibilities and found evidence to support the influences of each of these factors.

Holland's Personality Theory of Career Development. Holland (1973) stated that personality types develop as a result of a variety of forces including genetic, cultural, personal, and environmental. Specifically, Holland (1985, p. 16) suggested that "types produce types" meaning that individuals become a certain personality type based on parental influences, physical and psychological factors, as well as the availability of environmental opportunities. This combination of influences leads an individual to develop likes and dislikes for certain activities and these preferences are continually evaluated as the individual participates in different settings such as school, college, or job. The interaction between preferences and environments subsequently works to create a personality type that exhibits a predictable set of behaviors and characteristics as well as skills and coping styles (Holland, 1985).

Holland (1973) believed there are six basic personality types and developed a hexagonal model describing the relationship between them. The underlying theory for the model was based on four assumptions. First, people can be described in terms of their resemblance to six different types: realistic, investigative, artistic, social, enterprising, and



conventional. Also, work environments can be classified in terms of the same six types, with the corresponding types of people dominating the environment. Furthermore, people will seek an environment that is congruent with attitudes, values, skills, and abilities and which is stimulating and satisfying to them. Finally, a person's behavior is determined by the interaction between the individual and the environment and this influences such factors as work stability, job performance, and job satisfaction (Holland, 1973).

Holland's (1973) model is described as hexagonal in structure based on the similarities of the six personality types. This model is discussed in greater detail later in this dissertation because of its direct relevance to the development of the SII, the instrument used in this study.

Gati (1979) developed his hierarchical model in response to concerns he had about the hexagonal model of Holland (1973). Although Gati (1979) did not take issue with Holland's basic ideas regarding interest development, his model did differ dramatically from Holland's in structure. Assumptions of the circular and hexagonal models are that the adjacent fields are equidistant, and that certain fields tend to be grouped together. Gati (1979), however, cited a number of studies by other researchers which did not support either premise. Gati acknowledged that there are similarities between adjacent fields, but argued that their spatial representation in a hexagonal or circular manner greatly oversimplifies their empirical relationships. Instead, Gati (1979) proposed that occupations could be best represented as collections of attributes such as features of the work environment or the level of social relationships on the job. He also stated that the contrast model (Tversky, 1977 in Gati, 1979) served to explain the similarities and



differences among the vocations. Based on this model, it is assumed that the similarity between occupations increases as common features are added or as divergent features are deleted (Gati, 1979). Finally, Gati (1979) believed that the similar relationships among occupations could best be represented by a hierarchical tree structure, with a similar pattern for corresponding vocational interests.

At the highest peak of the hierarchy rests interests in all occupations (Gati, 1979). The second level is comprised of two major groups called interests in the "soft sciences" and interests in the "hard sciences" (Gati, 1979). The third level is divided into four minor groups which flow from the major hard sciences/soft sciences groups. Radiating from the interests in soft sciences are two groups: interests in service, social and cultural occupations; and interests in business, enterprising, organization, and conventional occupations. Flowing from the interests in hard sciences are two groups: interests in technological and realistic occupations; and interests in science and investigative occupations. The four minor groups flow into fields of occupations and then into the final level of specific occupations (Gati, 1979).

Gati (1979) set out to test his model by reanalyzing the variables presented in the intercorrelation matrix reported by Lunneborg and Lunneborg (1975, in Gati, 1979). The analysis Gati (1979) described in the literature is complex. However, the end result is his conclusion that a hierarchical structure of interests provides a better representation than does a circular or hexagonal one. In a practical sense this means that when someone is attempting to implement a career decision, they first decide on a major field of hard or soft science and then select one of the four minor fields. From there they move to an

occupational field and, thence, to a specific job. If, perchance, the individual does not like the chosen job, he/she can travel back up the hierarchy to a previous stage and regroup. However, in a circular or hexagonal model the individual who is unsatisfied with their career choice must ultimately leave the field for an adjacent field (Gati, 1979).

Theories of Career Development Based on Social Learning Principles. Mitchell and Krumboltz (in Brown & Brooks, 1984) based their theory of career development on Bandura's (1977) social learning theory of behavior. This theory rests on classic behavioralism and reinforcement theory and states that our individual personalities are based on our learning experiences. However, social learning theory adds the component that individuals also use their capabilities to act on the environment around them (Bandura, 1977).

The social learning theory of career development (Mitchell & Krumboltz, in Brown & Brooks, 1984) was developed to address why people choose certain careers, change careers, and express various occupational preferences. The theory examined the impact of genetic endowment; environmental conditions and events; learning experiences and individual performance on the career decision making process. Mitchell and Krumboltz included in genetic endowment inherited characteristics such as race, sex, and appearance. They felt that special abilities were likely to be a product of genetics as well as exposure to the environment. Environmental conditions could include social, cultural, political, economic and natural forces. Examples of such forces could include natural disasters, labor laws, availability of job opportunities, and limits on family resources for education and training.



Krumboltz and Mitchell also considered the impact of learning experience on career decision making. They suggested that with instrumental learning experiences, the individual acts on the environment to produce certain outcomes. They described associative learning experiences as ones in which individuals recognized connections between certain stimuli and the environment. With respect to career decisions, certain stimuli are viewed as having either positive or negative associations and may, therefore, influence the decision making process. They also considered the interactions among learning experiences, environmental factors and genetic endowment in their concept of task approach skills. Such skills might include values and standards for performance and work habits.

Also included in their theory is the concept of self-observation generalizations (SOG). These refer to the generalizations people constantly make about their skills and abilities after observing and evaluating their own performance. Parallel to these are world-view generalizations, observations made about the environment based on past learning experiences. These generalizations are then used to make predictions about future events. Krumboltz and Mitchell (in Brown & Brooks, 1984) stated that the emphasis on the learning experience as well as the consideration of interactional forces makes their theory applicable to both males and females and minority cultures.

Hackett and Betz (1981) also based their theory on the work of Bandura. They described a self-efficacy model of vocational preference in which preference is based, in part, on self perceptions about the individual's capability of performing on the job. This theory is based on Bandura's social modeling theory ( in Hackett & Betz, 1981).

Basically, the theory stated that perceptions of low self-efficacy may inhibit an individual's entry into a desired profession even though the occupation is perceived as providing desired outcomes. Hackett & Betz (1981) provided empirical support for this premise with respect to the underrepresentation of women in certain vocations such as law, medicine, management, and engineering. Essentially, they suggested that although females have the ability to perform in these types of professions, their self-efficacy perceptions are affected by gender-role socialization experiences and the lack of social role models for these jobs (Hackett & Betz, 1981).

Lent, Brown, and Hackett (1994) proposed a theory of career development based on Bandura's (1986) general social cognitive theory. Bandura put forth an interactive model called "triadic reciprocity" which suggests that interaction occurs in a bidirectional fashion between: (a) personal characteristics such as physical appearance, and cognitive and affective states; (b) external factors in the environment; and (c) overt behavior.

In addition to the concept of person-situation interaction (Bandura, 1986), Lent et al. (1994) placed emphasis on three social cognitive mechanisms with particular import for the process of career development. These components were self-efficacy beliefs, outcome expectations, and goal representations. Lent et al. (1994) viewed self-efficacy as a dynamic trait which allows for adjustment of one's personal view of his/her response capabilities depending on the particular performance requirements of the environment. Outcome expectations referred to personal beliefs about the probable consequences of performing a specific behavior (Lent et al., 1994). Also, according to the theory of Lent et al. (1994), goals were important determinants of behavior because they provided



organization, guidance, and sustenance for behavior even over long time periods and with little external reinforcement. Therefore, goals can help increase the chances that the desired outcome will be achieved (Lent et al., 1994).

Lent et al. (1994) made several key assumptions that genetic endowment, special abilities, environmental conditions and learning (including operant, associative, and vicarious) serve to influence career development in an interactive fashion. Their theory essentially took a constructionist approach to career development, one which underscores the importance of anticipation, forethought, and the assignment of meaning in the person-environment interactional process. They believed that this interactional process is most active up until late adolescence, at which point interests tend to stabilize. However, they also noted that change can occur at various developmental points across the lifespan, such as with the loss of employment, birth of a child, decline in health, or innovations in technology (Lent et al., 1994).

Based on these tenets, Lent et al. (1994) developed a causal model of person, contextual and experiential factors affecting occupational choice behavior. They also developed a causal model of task performance which highlights the roles ability, self-efficacy, outcome expectations, and performance goals. They noted that the model can be adapted to fit the career concerns of women and minorities by expanding the emphasis on certain aspects of the model. For example, extra emphasis might be placed on outcome expectations which may be affected by "glass ceiling" obstacles or lack of affirmative action hiring policies (Lent et al., 1994).



Valence Instrumentality and Subjective Expected Utility Theories of Career Decision Making. Mitchell and Beach (1976) described expectancy theory and decision theory as models that can be used to predict vocational preference and choice. They referred to the work of Vroom (1964, in Mitchell & Beach, 1976) who stated that occupational choice depends on the degree to which a certain choice is viewed as having a greater likelihood than any other choice to lead to an attractive outcome. Vroom developed models to predict both valence and force towards behavior. Valence refers to the anticipated satisfaction which is associated with a particular outcome. Algebraically, it is the sum of the products of the valences of all other outcomes and the individual's perception of the instrumentality of the specific outcome for obtaining of the other outcomes (Vroom, 1964, in Mitchell & Beach, 1976). Force towards behavior is a function of the sum of the products of the valences for all the outcomes and the strength of the individual's expectancies that the action will be followed by obtaining the outcomes (Vroom, 1964, in Mitchell & Beach, 1976). Mitchell and Beach (1976) named these two models the valence model and the choice model, respectively. They stated that the valence model has been used to predict job choice and satisfaction while the choice model has been used to predict job effort.

Mitchell and Beach (1976) also reviewed subjective expected utility decision theory which is based on the principle of maximization of expectation. The theory states that "the expectation for any action is the algebraic sum, across potential outcomes, of the values of each of the possible outcomes of that action and of their respective probabilities of occurrence should the action be performed (p. 237, Mitchell & Beach, 1976). In

practical terms, this means that each individual will consider all possible occupational alternatives and assess the probability that each one would lead to various outcomes as well as the value the individual assigns to the outcome. Mitchell and Beach (1976) then reviewed a number of research studies which supported the utility of the aforementioned models.

Wheeler and Mahoney (1981) also espoused an expectancy model approach to vocational preference and choice. In this model, a distinction is made between occupational preference and choice. This distinction is based on attraction, expectancies, and costs. Occupational valence is an important component of this theory. Specifically, valence is a function of an individual's attraction to an occupation. It is assumed that occupations with the most potential for provision of rewards and important outcomes will be more attractive and preferred, and thus, have the most positive occupational valence (Wheeler & Mahoney, 1981).

Vocational choice is also affected by expectancies about entering an occupation (Wheeler & Mahoney, 1981). These expectancies are colored by real world realities. For instance, even though an individual may have the ability to pursue a career as a realtor, the risk of failure due to reliance on commission as the sole income may lower the individual's expectancies for success and serve to prohibit entry into this career. Wheeler and Mahoney (1981) also stated that preparation costs will influence vocational choice. They define these costs in terms of time, effort and financial resources necessary to prepare for entry into the chosen field. For example, though a career in medicine is



highly desirable for a person, they may forego it because of the vast amount of necessary schooling and the lack of financial resources.

The Role of Occupational Stereotypes in Interest Development. Underlying all the theories of career development is the notion that individuals have developed a fund of stereotypic knowledge about the vast array of occupations. Included in this fund of knowledge is information about likely occupational outcomes and the probability of their attainment, and occupational requirements and the likelihood of meeting them. These occupational stereotypes then become a basis for statements of occupational preference and choice.

Banducci (1970) set out to explore the relationship between occupational stereotypic accuracy and variables including socioeconomic status (SES), academic development, vocational interests, crystallization of plans, and range of personal experience. For his sample of 679 twelfth-grade boys with a wide range of SES at three Midwestern high schools, Banducci (1970) found that SES, academic development, crystallization of plans, and vocational interests were related to occupational stereotype accuracy, but that range of personal experience had no significant influence on accuracy after controlling for SES and academic development. Specifically, Banducci (1970) found that there was a significant positive relationship between academic development and vocational perceptual accuracy, and that students of lower SES were less accurate in their vocational perceptions than higher SES students. To summarize, Banducci's (1970) work supports the notion that personal developmental variables have an effect on the accuracy of occupational stereotypes.

Hollander and Parker (1972) studied occupational stereotypes in relation to self-description. More specifically, they endeavored to test Holland's (1959) idea that the implementation of vocational choice partly involves congruence between self-description and knowledge of occupational stereotypes. The subjects in their study were fifty-four predominantly middle class Caucasian high school sophomores from urban Oklahoma. The subjects were administered the Adjective Check List (Gough & Heilbrun, 1965 in Hollander & Parker, 1972) as a measure of self-description and occupational stereotypes. They were also given an Occupational Preference List constructed by Hollander & Parker (1972) to determine vocational preference. The results showed that stereotypes played a significant role in vocational exploration and choice (Hollander & Parker, 1972). The results also supported the idea that self-description is related to occupational choice for adolescents. This is similar to Holland's (1973) idea that individuals will search for a work environment that is congruent with their personal characteristics.

Bloch and Rim (1979) also examined occupational stereotypes, and they, too, suggested that each individual has a system of implementing vocational choice based on his/her structure of occupational stereotypes, and that this structure is influenced by individual background variables. However, Bloch and Rim (1979) believed that there is a universal perception of occupations that is not influenced by individual background variables such as age, school, SES, intelligence or parental occupation. They designed research to identify the individual dimensions used for occupational classification as well as to classify these dimensions into values categories commonly associated with vocational choice (Bloch & Rim, 1979). The results showed that individual values can be



organized into a 20-values scheme, and that occupational affinity is not influenced by individual background variables or the level of information an individual possesses about that occupation (Bloch & Rim, 1979). Furthermore, Bloch and Rim (1979) found that some values are used frequently by the majority of the population, but that there are values which are used less often and even some unique values used by select populations. Finally, their study revealed that boys perceive the world of work less uniformly than girls (Bloch & Rim, 1979).

Summary of the Literature on Career Interests and Theory. In summarizing the literature on the various theories of career development and their relationship to occupational stereotypes and career indecision, it is important to note the similarities and differences between them. I think it is safe to say that all of the theories assume that each individual has a fund of basic knowledge about themselves and occupations in general. The developmental, personality and social learning theorists focus more on how interests develop and their relationship to aspects of the environment and the self. The valence instrumentality theorists tend to focus more on how interests are implemented. For the purpose of this research study, more emphasis has been placed on the personality theory of Holland (1973) since the SII's General Occupational Themes are based on Holland's (1973) personality types. However, the explanations about how the SII works as an instrument to aid in career decision making are very much related to the underlying notions about how interests are defined by Super (1957), and Dawis and Loftquist (1984). In this study, it is postulated that rural and urban students may respond differently on the

SII. If this is true, then it is also necessary to begin thinking about how each of the theorists might account for this.

### History and Structure of the SII.

The Strong Interest Inventory (SII) is one of the most widely used career interest inventories. It is commonly used as an aid in the career decision making process, especially at college counseling centers. Because of its popularity, it has also served as the basis for many research projects. The fourth edition of the Strong Interest Inventory (SII) used in this study has evolved from its earliest predecessor, the Strong Interest Inventory Blank (SVIB) which was first published in 1927 by E. K. Strong (Campbell, 1987; Hansen, 1987). In the nearly 70 years since its inception, the SVIB has undergone many revisions (Campbell, 1987; Hansen, 1987). Though the SVIB published in 1927 was for men only, Strong later published the first women's form in 1933 (Campbell, Crichton, Hansen, & Webber, 1974). Although the rationale for creating a separate women's form was never expressed by Strong or the publisher, Campbell et al. (1974) surmised that it occurred because of differences in the available employment opportunities for men and women as well as gender differences in responses to the items on the test. Campbell (1974) then undertook the task of combining the same sex forms as well as adding the general occupational themes, (based on Holland's theory of personality) to the inventory (Holland, 1973). This 1974 merging of forms was in response to claims that the inventory was gender biased. The theoretical framework of Holland was added to assist in the organization and interpretation of the scores and to address the criticism that the test was atheoretical in nature (Campbell et al., 1974;

Anastasi, 1988). At this time, the test became known as the Strong Campbell Interest Inventory (SCII), Form T325 of the SVIB (Campbell, 1987).

Since 1974, revisions in 1981 and 1985 expanded the instrument and improved its format. According to Campbell (1987), the 1985 revision also sought to develop current reference groups for Women-in-General, Men-in-General, and the Occupational Scales. Another major goal of this revision was to expand the usefulness of the test by including non-professional occupations in addition to the professions already listed.

The 1985 SII version of the test used in this study emerged to contain 264 scales including 6 General Occupational Themes (GOT), 23 Basic Interest Scales (BIS), 207 Occupational Scales, special scales for Academic Comfort (AC) and Introversion-Extroversion (I/E), and 26 Administrative Indexes (Hansen, 1992).

Presently, the SII contains 325 items about occupations, school subjects, leisure activities, types of people, and individual test-taker characteristics. The respondent is asked to answer the items by choosing from these categories: "Like," "Indifferent," or "dislike." The test is then scored by computer.

Uses of the SII. The original version of the SII developed by Strong in 1927 employed the empirical method of test construction (Hansen, 1987; Hansen, 1992; Anastasi, 1988). It was found that people in the same occupation had similar interests, and that these interests could serve to differentiate people in one occupation from another. Therefore, the SVIB was developed to compare the similarity of the test-taker's interest to those of people employed in various jobs.



In addition to measuring an individual's occupational interests, the current version of the SII can also indicate interest in different leisure activities, interest in spending time with various types of people, and interest in living or working in selected environments (Hansen, 1992). And, although the major use of the instrument is in career counseling, it can be used in a variety of ways within that context. For instance, some clients may wish to expand the repertoire of occupations they have considered in the past to include new areas. Other clients may wish to narrow the number of choices to a select few. Still other clients may desire to confirm a career choice they have already made (Hansen, 1992). Regardless of the client's reason for using the instrument, the SII can assess interests and help integrate them with the world-of-work. This, of course, assumes that the client has a good understanding of self, interests, and the world-of-work. For some clients (possibly some of the rural clients I have worked with), this may not be the case, which is, of course, the reason for this study.

#### Description of the SII Scales

General Occupational Themes: Campbell and Holland (1972) derived the SVIB Occupational Theme scales for men and Hansen and Johansson (1972) constructed similar scales for women, both based on the research of Holland (1959). Holland presented his theory in Making Vocational Choices: A Theory of Careers (1973). As previously mentioned, a person is classified according to one or more of the six personality themes of Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Theoretically, there are 720 possible theme combinations (Hansen &

Campbell, 1985). For practical reasons, most clients are classified by the one to three types with the highest scores. This is referred to as the personality pattern.

Personality patterns can also be described in terms of consistency and differentiation. Consistency refers to whether or not a pattern's related elements have common characteristics. For example, a pattern of Realistic-Investigative is considered consistent because it has common traits such as an orientation towards things rather than people. Conversely, a pattern of Conventional-Artistic is considered inconsistent because the traits are opposites on such factors as desire for control and expressiveness (Holland, 1985). Differentiation in a pattern denotes the numerical difference between a person's GOT scores. Well differentiated patterns are ones that reflect profiles which resemble single personality types. Poorly differentiated profiles are called "flat" and represent a person who equally resembles each theme type and thus cannot be characterized in a predictable fashion.

Characteristics of individuals of each of the six theme types follow. Realistic persons enjoy practical, concrete activities as opposed to abstract thinking. They tend to be mechanically inclined, well-coordinated, rugged individuals who enjoy work involving physical activity. They typically do not enjoy social settings which require them to be verbally and interpersonally skilled. They prefer occupations such as farmer, fish and wildlife specialist, mechanic, electrician, and engineer.

Investigative individuals enjoy activities that are scientifically oriented, involve problem solving, abstract thinking, and intellectual ability. These individuals tend to be rather unconventional in their values and ideas, and are often introverted and

independent. They typically enjoy such occupations as college professor, biologist, chemist, astronomer, or psychologist.

Artistic types prefer unstructured activities that allow freedom of self-expression and creativity. Like Investigative types, they are rather unconventional and introspective, but prefer working with artistic and musical media and value aesthetic quality. Typical job preferences include artist, musician, writer, photographer, or interior decorator.

Social types are typified by their extroverted, humanistic nature. They enjoy activities that require social and interpersonal skill. They like group activity, as well as being the leader of the group. Examples of preferred jobs include: teacher, social worker, counselor, or speech therapist.

Enterprising types are strong leaders and use their verbal and management skills to dominate, organize, and sell. They prefer activities that do not require sustained periods of intellectual inquiry. They are often viewed as popular, powerful, aggressive, social, and status-seeking. They often choose a job as business executive, real estate salesperson, insurance agent, or politician.

Conventional types prefer activities that are structured and well-organized. Like Enterprising types, they identify with those in power and value status and material possessions, but they typically avoid leadership positions. Instead, they seek work that is systematic and that allows them to operate in an efficient, practical, and conscientious manner. They typically seek employment as: accountant, bookkeeper, office worker, banker, or IRS agent.



The SII GOT scales were constructed by selecting 20 items that represent each type, based on Holland's descriptions (Campbell & Holland, 1972; Hansen & Johansson, 1972). The scales proved to be correlated with each other, and based on the intercorrelational strengths, an underlying hexagonal structure emerged. The structure is such that the types that are directly opposite each other have the weakest correlations while those next to each other have the strongest correlations (Hansen & Campbell, 1985).

For the 1985 version of the SII (Hansen & Campbell), the GOT scale was normed on a sample of 600 people of half men and half women. They were meant to represent People-in-General from various professional, technical, and non-professional occupations represented in all six GOT types (Hansen & Campbell, 1985). The mean age of the sample was 38.2 years, and the level of education ranged from those without a high-school diploma to those with Ph.D's.

The raw score means and standard deviations for this norming group were used to create a standardization formula that converts all scores to standard score distributions with a mean of 50 and a standard deviation of 10. Men and women have different distributions for each theme, and an individual's results should be interpreted based on the distribution for their sex. Then for each sex, the computer assigns an interpretive comment corresponding to the percentile band the individual falls in, based on the in-general norming group. The interpretive labels include: very high, high, moderately high, average, moderately low, low, and very low. These GOT scores are then used to provide a general view of the client's occupational orientation (Hansen & Campbell, 1985).

Test-retest reliabilities for the GOT are reported by Hansen and Campbell (1985) to range between .85 to .93 for a two-week interval, from .84 to .91 for a thirty-day interval, and from .78 to .87 for a three-year interval. These reliabilities indicate relative stability, but with some changes.

Internal-consistency reliabilities of the six GOT's were also computed using coefficient alpha. For a male sample of 1445, the range was from .90 to .95, and for a female sample of 1410, the range was reported at .90 to .93. This indicates a high level of internal consistency reliability for each GOT scale (Hansen & Campbell, 1985).

Hansen and Campbell (1985) report several validity studies of the GOT's. One such study at the University of Minnesota found high correlations (median = .765) between the GOT's and the scales on the Vocational Preference Inventory. This indicates construct validity given that the two tests appear to be measuring similar interest traits.

The Academic Comfort Scale: This scale has undergone many label changes on past editions of the SII and has even been eliminated from the most recent version. However, the Academic Comfort Scale (AC) was a part of the 1985 version of the SII, and a scale which I used regularly in the interpretive process.

The scale is labeled such because it seems to be measuring comfort in an academic setting. On the earlier versions of the SII, the items for this scale differentiated between good and poor students at the University of Minnesota's College of Liberal Arts. Items corresponding to academic pursuits were weighted positively and items denoting such things as blue-collar jobs were given a negative weight. When the scale was normed on

the graduates of liberal arts colleges, the mean was 50, and Ph.D's usually scored in the 60's (Hansen & Campbell, 1985).

The 1985 version used the same norming groups as the 1974 version. For the men, the sample included 421 college professors, and for the women, 275 psychologists and 119 mathematicians. It is unclear why they did not sample men and women from the same occupations. The sample yielded scores with a mean of 60 and a standard deviation of 10. The 1985 version continued to show scores in the 60's for Ph.D's. (Hansen & Campbell, 1985).

The 1985 reference samples showed that the 300 women in the Women-in-General sample scored higher on AC than the 300 men in the Men-in-General sample, with scores of 47 and 44 respectively. The standard deviations were 14.7 and 14.9 respectively (Hansen & Campbell, 1985). However, Broday and Braswell (1990) found virtually no gender differences on AC for a sample of university students. They also found that the overall mean AC scores were lower for their college counseling center sample than for professional men and women, and suggested this was due to level of educational attainment. Indeed, Hansen (1992b) provided the following standardized ranges: scores 60-65, Ph.D's; 50-55, professional degrees; 45-55, master's and bachelor's degrees; 35-44 associate or vocational/technical degrees; and 34 or lower for high school diplomas.

The reliability of the AC scale as measured by test-retest ranges from .91 to .85 for intervals of two weeks to three years (Hansen & Campbell, 1985). This indicates strong temporal stability of the scale scores. The validity of the AC scale is usually assessed by using the score to determine some future behavior such as entrance into college or grade



point average. However, a variety of studies have shown modest correlations, at best. For instance, Hansen and Campbell (1985) report AC correlations with college grades ranging from .10 to .30. A study by Johnson (1969) found a correlation of .10 between Academic Achievement (AACH, precursor to AC) and freshman GPA for undergraduate males. Wagman (1971) found a correlation of .35 between AACH and GPA for a group of undergraduate and graduate males and females. Also, Swanson and Hansen (1985) found correlations between AC and GPA of .26 for freshman and .20 for seniors.

In relating AC to college attritional level, research by Wright (1976) found no differences in Academic Comfort between a group of students who graduated from college and a group who did not. Swanson and Hansen (1985) also found that AC seems to act as a moderator variable when predicting the choice of a college major. That is, students with high AC scores in the freshman year were more likely to choose majors consistent with their SCII profiles.

Broday and Braswell (1990) examined the relationship of the AC scale to other scales on the SCII. Among other things, they found that AC was significantly positively related to the number of items to which test takers responded "like," and significantly negatively related to the number of "dislike" responses. They also found strong positive relationships between AC and Investigative and Artistic General Occupational Themes (GOT).

Finally, a study by Tomlinson and Evans-Hughes (1991) found an interaction effect of gender and ethnicity on AC scale scores for a group including African Americans, Hispanics, and Whites. In their sample, White and Hispanic women scored higher on AC

than did White and Hispanic men. Furthermore, African American men scored higher than did African American women on the AC scale. They suggest that the relationship between AC and educational persistence with minority populations is a subject for further study.

The Introversion-Extroversion Scale: This scale is considered to be an indicator of a client's interest in working with things or ideas, versus working with people. The scale was originally constructed by comparing SVIB responses of two groups of students from the University of Minnesota: those defined either as extroverts or introverts on the Minnesota Multiphasic Personality Inventory (MMPI). The 1985 Women-in-General sample of 300 had an average score of 48 with a standard deviation of 10.4, and the Men-in-General sample obtained a mean score of 50 with a standard deviation of 11.2. Professional women and men scored 48 and 49, respectively, while non-professional women and men scored 49 and 50, respectively (Hansen & Campbell, 1985). Test-retest statistics indicate relative stability over time with correlations ranging from .91 to .82 for intervals of two weeks to three years, respectively (Hansen & Campbell,).

The Administrative Indexes: Finally, the test profile reports percentages of responses marked "Like," "Indifferent," or "Dislike," for each of the inventory parts. This index gives an indication of the client's response style. While the percentages vary according to test category and gender, the mean "Like" response percentage for the inventory is 37 and the standard deviation is 12. When a client has a high level of any response category, this will affect the scores across the GOT, BIS, and OS. Clients with a high percentage of "Like" responses have elevated scale scores and there could be a variety of reasons why



they respond in such a manner. Some are simply curious, have a variety of interests, or are enthusiastic. Others may be unfocused, or unable to say "no."

Clients with a high percentage of dislikes tend to have low scale scores. This response tendency usually occurs for one of two reasons. Respondents may already be interested in a single career and so mark "Dislike" for all the others. Another reason is that they really do not like a lot of the available choices. The client who falls in the second category is challenging and the counselor will need to explore the reasons behind this. Also challenging is the client who has a high percentage of "indifferent" responses. These individuals are often experiencing a high degree of career indecision or apathy regarding choice. No clear interests emerge from the inventory, often rendering unhelpful results. Again, the counselor must ascertain the reasons behind such a response pattern in order to be helpful.

#### Advantages and Disadvantages of the SII

One of the main advantages of the SII is the fact that it is so widely used as a career-decision making instrument and a tool for research. It is considered psychometrically sound, with an excellent manual (Isaacson, 1985). Many researchers have verified the validity of the instrument for various populations, as well as its reliability over time. The SII provides information at both general (GOT and BIS) and specific levels (OS) (Isaacson, 1985). Finally, the SII is relatively simple to complete in a short amount of time.

Most of the criticisms of gender inequality on the SII were addressed when the test was revised. The original pink and blue forms for women and men have been



incorporated into one form for both genders, and test items have been updated to remove sexist language and items (Hansen, 1992a). Research, however, does not always support the gender neutrality of the SII. A study by Lapan, McGrath, and Kaplan (1990) found gender differences in the way the BIS scales are assigned to the General Occupational Themes. Spokane (1979) using preferred occupational choice measured during the senior year as a criterion, found that the SII had lower predictive and concurrent validity for college females than it did for males.

Many other studies have attempted to determine the validity of the SII for females, with mixed results. Most of the studies occurred after the new 1974 form and supported its validity for females. There may, however, be concerns that gender differences on the SII are based on gender differences in career-decision making. Crowley (1979) noted that the SII, which is based on Holland's classification scheme, uses intrinsic factors related to job activities as a basis for selection. Many women, however, consider extrinsic factors more heavily, such as working conditions and the effect of the occupation on current or future relationships in career choice (Raphael & Gorman, 1986; Lunneborg, 1978). Nevertheless, it is true that men and women respond differently on the SII, as evidenced by score differences on the scales (Hansen & Campbell, 1985). Reasons for these differences are not fully understood, and consequently the interpretations of a woman's profile should be made with caution and consideration of differences in ability, environmental presses, career development and decision making for women and men (Schneider & Overton, 1983).

Another disadvantage of the SII is that individual response style affects the scale scores, and thus the usefulness and interpretation of the profile (Isaacson, 1985). This has been an on-going frustration for me as a career counselor because the instrument is to help people in career-decision making, but is often unhelpful for those who are especially undecided. In particular, individuals with high amounts of "Indifferent" or "Dislike" responses end up with profiles that are virtually useless. This is because the resulting profiles have very few career matches and the RIASEC scores are essentially undifferentiated.

Regardless of the various disadvantages, the SII remains one of the most widely used tests to aid in the process of career decision making. For the purpose of this study, it is necessary to consider its use with subjects from college counseling centers and who are of and who are classified as minorities.

#### Use of the SII for College Students

Because the subjects in this study were students at the University of North Dakota, it is important to discuss the use of the SII with a college population. Furthermore, much of the research conducted on the SII has involved samples of college students. For instance, Lunneborg (1977) found that the SII correlated well with the Vocational Interest Inventory which has a similar theoretical basis. This evidence of construct validity was gathered using a college counselee sample and supported the validity of the GOT's.

Wallace and Walker (1990) also used a college sample for their research and found that the level of congruence between students' SII profile and their current college major was moderated by the students' self-concept. Specifically, students with high self-

concepts had better congruence scores (matches) between their interests on the SII and their choice of academic major. And conversely, students with low self concepts had lower congruence scores between their SII interests and academic major choice. Furthermore, the congruence between self concept and interests was not affected by gender and ethnicity. Therefore, it might be wise for a college career counselor to consider issues of self-concept in addition to interests as part of the client's career decision-making process.

Holcomb and Anderson (1978) studied whether or not congruence between a student's interests and academic major choice would predict college graduation. Among their sample of 195 college agriculture students, 54% had SVIB interest patterns congruent with their current major (labeled Congruent). 46% of the students (labeled Discrepant) did not have SVIB interests congruent with major. There were no differences between the groups on the rate of college graduation. Differences were found, however, on changing academic majors. Discrepant subjects were more likely to change majors than congruent subjects.

Wigington (1985) examined occupational choice and various aspects of client's choices on the SCII in a college population. His study is based on the idea that, as Campbell (1971) reported, there are correlations between the Academic Achievement scale and the General Occupational Themes that suggest ordering of the themes. Campbell suggested that the relationship leads to a theme order of I,A,S,C,R,E. This occurs because students with high Academic Achievement Scale scores will likely choose items which correspond to professional careers or college subjects most of which



are represented in the GOT's of Investigative, Artist, and Social. Holland (1973) suggested that the relationship is I,S,A,C,E,R. Wigington (1985) found a different relationship between Academic Comfort and GOT for college women than for men. For women, he found an order like Campbell (1971) did of I,A,S,C,R,E. But for men, he found an order of I,A,R,S,C,E. Even though the order is somewhat different, it appears that Academic Comfort scores correlate highly with Investigative and Artistic themes, ones which have a high correspondence of college majors leading to professional careers. He also found that students with a high percentage of "Like" scores will have elevated AC and GOT scores, and low I/E scores. This suggests that the SCII is indeed, affected by response style, something college counselors need to closely consider.

Based on subjects in a college sample, Smart (1989) developed a causal model to investigate the influence of various aspects of life history on the development of Investigative, Social and Enterprising personality types proposed by Holland. These three types were selected because most college students typically enter jobs that would be classified in one of these areas following graduation.

Smart (1989) found that gender had a direct effect on the development of personality type. The results indicated that more men were likely to become Investigative or Enterprising types and more women were likely to become Social types (Smart, 1989). Smart (1989) also found that family socioeconomic status as well as parental occupation influenced the development of the three personality types in both the positive and negative directions. Specifically, those who develop into Social types tend to be women from less affluent families whose parents are likely working in Social occupations,

whereas Investigative and Enterprising types tend to be males from more affluent families in which parents are typically not employed in Investigative and Enterprising jobs (Smart, 1989). Furthermore, Smart (1989) found that a subject's orientation to being either Social, Investigative, or Enterprising in 1971 was directly positively related to their vocational type in 1980.

With respect to the college experiences of the subject, it appears that undergraduate GPA does not have a significant direct effect with reference to any of the personality types (Smart, 1989). It does, however, affect Investigatives in a positive, indirect fashion, and Socials in a negative, indirect manner. Smart (1989) stated that the congruence between choice of college major and current vocational type has a much stronger influence than GPA in his causal model.

Another aspect to consider regarding the use of the SII for college populations is whether there are differences between counseled and non-counseled students' responses on the instrument. Tryon (1983) found that counseled students who took the SCII had higher AC scores as well as higher scores on Investigative and Artistic themes than did non-counseled students. She also found that non-counseled students had higher Enterprising theme scores than did counseled students. She concluded that students who are low on academic orientation do poorly in school. This study is interesting to me because based on my experience, the results would be the opposite. That is, counseled students tend to have lower AC scores and themes of I and A than non-counseled students.



### Use of the SII with Minority Populations

Because this study is investigating the use of the SII for a rural population, a group often considered to be a minority, it is necessary to review the literature on this topic. It should be noted that all studies reviewed here used college students as subjects, thus supplementing the literature in that area as well. To date, several researchers have investigated the use of the Strong Interest Inventory with various minority populations. Results have been mixed, with some studies supporting the use of the SII for ethnic minorities, and others not (Hansen, 1992b).

Haviland and Hansen (1987) found that the SCII had reasonably good concurrent validity when examining college major and Occupational Scale scores for a group of American Indian college students. Their research sample used 49 American Indian students at a Rocky Mountain region college (28 women, 21 men). They assessed criterion validity in two ways. First, they used a modified McArthur method (assigning point values for prediction correctness for an "excellent hit, moderate hit, or poor hit," ) to determine the concurrent validity of the SVIB-SCII Occupational Scales for declared academic major. Second, they evaluated congruence between corresponding GOT scores and major (Haviland & Hansen, 1987).

Their results showed that for sixty-four percent of the women and forty-four percent of the men, there was excellent and moderate concurrent validity for relationships between major and OS. For congruence between major and GOT, their results indicated high and moderate congruence for eighty-nine percent of the women and one hundred percent of the men (Haviland & Hansen, 1987). Their discussion of the results suggested that this



instrument is at least as valid for Native American women as it is for White women, given that the hit rate for the Native American women resembles that of White women. However, the forty-four percent rate for Native American men is markedly lower than the sixty percent reported for white men by Hansen and Swanson (1983). The authors believed this may be due to the lower graduation rate for Native American men, the fact that the men select majors that do not lead to a terminal degree, and the evidence that Native American women seek career counseling services more often than the men, leading to more well-developed career interests. Finally, the authors suggested that the results of the study are limited in their generalizability to other American Indian college students because the sample was small in number and represented only a few tribes.

Another study by Whetstone and Hayles (1975) found that the Strong Vocational Interest Blank (SVIB) predicted career group membership for a sample of Blacks as well as it did for Whites. In their study, they wished to know if the SVIB norms were usable for Black men, if the SVIB was adequate for detecting primary and secondary interest patterns for Black college men, and whether Black and White college men differed in their interest patterns. Their sample included 69 Black college men and 75 White college men from the University of Colorado. The researchers classified a subject's major as either consistent, questionable, or inconsistent with his SVIB results. The results were positive, indicating that approximately two-thirds of the Blacks and three-fourths of the whites had SVIB primary and secondary interests consistent with their major (Whetstone & Hayles, 1975). There were differences, however, on the BIS, and Black men also had lower Academic Achievement scores (precursor to AC). The authors suggest that the

results should be applied with caution to Blacks from rural populations, as they were not included in this sample (Whetstone & Hayles, 1975).

Swanson (1992) also found that the SII appears applicable for African-American college students. Her study sought to ascertain whether two aspects of Holland's model, the underlying hexagonal structure and the ordering of the GOT's, was the same for Black students as for Whites. The subjects consisted of 1826 Black Midwestern college students. The results showed that Holland's model, on which the SVIB-SCII is based has the potential for applicability for Black students, but that more research is needed. The underlying hexagonal structure, while still somewhat hexagonal in shape, deviated from its equilateral shape because of significant differences in the intercorrelations among the GOT scales. Swanson (1992) also found significant differences between Black men and women's GOT scores, as well as between the GOT scores for the Black subjects and the reference sample indicating both gender and race effects. Again, Swanson (1992) suggests that these findings indicate a need for more research with the SVIB-SCII for Black Americans.

Montoya and DeBlassie (1985) endeavored to determine if differences existed on the SCII responses between a group of Anglo and Hispanic college students. Their subjects were 88 Anglo and 88 Hispanic students at New Mexico State University, who were administered the SCII as part of career counseling. Results showed no differences between Anglo and Hispanic students on the Introversion/Extroversion scale or on the GOT's. However, on the Realistic theme, although there were no race effects found, there



were significant differences between males and females. These results suggest that the SCII may be applicable to the Hispanic population.

Tomlinson and Evans-Hughs (1991) researched gender and ethnic differences on the SCII for a group of White, Black, and Hispanic college students at an eastern university. They found an effect for gender on the Realistic theme with males scoring higher than females. They found no differences between ethnic groups on any GOT scales. The Academic Comfort (AC) score mean for the group was 27.9, lower than would be expected for a typical university sample. No significant effects for ethnicity or gender were found on the AC scale. Another observation was that 49% of the profiles were "flat and undifferentiated", which the authors attribute to the low AC scores. A question which the authors did not address, is whether the sample AC score differs significantly from the general reference sample, and if so, why?

The results of validity studies for the use of the SII with other minority populations have yielded mixed results. Therefore, it is appropriate to examine the use of the SII for rural individuals, who are often considered a minority group.

#### Career Concerns for Rural Populations

Although there are many within group differences, there are some commonalities known about the quality of life for rural individuals. Murray and Keller (1991) reported that rural areas contain a disproportionate number of poor, and that the economic development of rural areas generally lags behind that of metropolitan areas. They further stated that rural areas have smaller proportions of workers employed in white-collar occupations, rural residents attain lower educational levels, and are less frequently



members of the work force. If this is true, how might this impact the development of interests germane to the career selection process? Additionally, many rural Americans have, in the past, been farmers. However, due to recent agricultural crises, many have had to leave this career. How has this factor affected students' career decision-making?

Apostal and Bilden (1991) suggested that rural students as compared to urban students have unique considerations affecting the process of educational and career decision-making. They stated that rural students are hampered because of "reduced accessibility to higher education, narrow rural school curricula, limited exposure to the world of occupations, and few role models (p. 153.) They further suggested that the 1980 agricultural crisis may have had an effect on the educational aspirations of rural students such that increasing numbers are moving towards higher education. Indeed, their study showed that there is a great disparity between rural and urban students' educational aspirations. Their sample of North Dakota high school students showed that 72.4% intended to pursue a four-year college education, compared with 29% in a national sample. Apostal and Bilden (1991) stated that North Dakota career counselors should note these high aspirations and should provide students with guidance which also considers their abilities and interests.

Trice (1990) concluded that the career interests of rural children are relatively stable over time, and are very much related to those of their parents and other community members. Thus, if rural children are exposed to smaller numbers of careers, how might this factor affect the range of their career interests and responses on the SII?

Poole, Langan-Fox, and Omodei (1991) discussed several examples of research in which geographic location is taken into consideration for determining career choice. They refer to Schiamberg and Chong-Hee Chin's study (1987, cited in Poole, et al, 1991) which concluded that the strongest influence on a child's later choice of education and career is their family background. They further referenced several studies which suggest that rural families are more traditional than urban families. This may be due to strong kinship ties and limited social interaction which in turn allows already held conventional values to be reinforced and strengthened. If these conventional values influence subsequent career choice, how then might this affect responses on the SII?

Lauver and Jones (1991) explored a self-efficacy model for career choice among rural American Indian, White, and Hispanic high school students. They found gender differences in career self-efficacy and perception of career options. In particular, their findings suggested that rural females' efficacy and aspirations equal or exceed those of rural males. But, what happens when these rural students enter college? Does efficacy remain high given the abrupt change from a close-knit rural community to the larger urban campus?

### Summary of the Literature

Throughout the review of the literature on vocational interest development, there exist some common threads. Whether the theory is developmental, based on personality or social learning principles, or focused on valence instrumentality for career choice, the basic assumption is that we all have interests or preferences for different activities or occupations. Furthermore, the theories assume that we all have a basic fund of

knowledge about different careers. Additionally, many of the theories have suggested that interests are very much related to aspects of the environment as well as individual characteristics.

All of these assumptions underlie the structure of the Strong Interest Inventory, which continues to be one of the most widely used and researched career interest inventories. When researching the SII, many scientists have endeavored to ascertain its usefulness with a variety of populations. A number of studies have been based on university populations and have found the SII to be useful for career decision making. Research studies based on college samples have helped establish the SII's reputation for excellent reliability and validity. Additional research has generally concluded that males and females do tend to respond differentially on the SII, but that this is not necessarily an indication of gender bias. Furthermore, many researchers have concluded that, for the most part, the SII appears to be applicable to many minority populations including African-American, Hispanic, and Native American.

#### Statement of the Problem

This study is an attempt to build on the already extensive body of literature on the SII. To date, relatively little has been written which specifically addresses the vocational interests of rural students. Since rural students are considered to be of minority status and often an under-served population, it seems important to consider their needs. While serving as a career counselor at the University of North Dakota, I had the opportunity to assist rural students in the process of career decision making. In many instances, the SII was used to assist in this process, and the SII results obtained were not very helpful due to



the low GOT scores and few corresponding careers on the OS. I began to wonder if the aspect of being from a rural environment had an effect on the SII responses. Based on my clinical observations, as well as on the lack of literature support for the use of the SII with rural populations, this study was designed to investigate whether differences exist between rural and urban students on selected SII scales. And, because previous research suggests that gender differences often exist on the scales, it is necessary to consider this aspect, as well, in some of the analysis. Also, since previous research suggests that gender, AC, and ACT scores may be used to some extent to predict college GPA, I wish to investigate whether they predict in the same way for rural students. This factor is important to consider for purposes of retention, a common concern for universities with respect to minority students. Furthermore, given that students from rural and urban backgrounds may have different interests and levels of knowledge and exposure the world of work, and that these interests are likely reflected in their SII GOT scores, I would like to investigate whether differences exist between the two groups on measures of congruence between the RIASEC scores and college major. A related question is whether or not differences exist between rural and urban groups in the way they respond on the SII with respect to the number of "indifferent" responses chosen. A final factor for examination is whether the two groups differ in the amount of differentiation in their RIASEC scores, since a lack of differentiation results in low, undifferentiated, and unuseful profiles. Therefore, I have formulated the following questions that I would like to investigate in this study:

- a. Are there mean differences between rural and urban college students on the SII GOT scales, AC scale, and the I/E scale?
- b. Does being from a rural/urban environment moderate the relationship of AC and ACT to GPA?
- c. Does being from a rural or urban environment affect the Iachan congruence score between choice of college major and RIASEC scores?
- d. Does being from a rural or urban environment affect the subject's level of indifference in responding on the SII?
- e. Does being from a rural or urban environment affect the subject's profile differentiation on RIASEC scales?

## CHAPTER 3

### Method

#### Statement of the Problem

The purpose of this study was to examine whether differences existed between rural and urban subjects' scores on various scales of the SII, their level of "indifferent" responses, predictive validity of the GOT and the subject's major, and the degree of differentiation in a subject's GOT scores. An additional focus was whether the relationship between AC and cumulative GPA was the same for subjects from rural and urban environments. The questions for study, stated in null hypothesis form are as follows:

- a. There are no mean differences between rural and urban subjects on the SII GOT scales, the AC scale, and the I/E scale.
- b. There is no difference in relationship between GPA and AC for rural and urban subjects.
- c. There are no mean differences between rural and urban subjects' Iachan scores (measuring the congruence between the GOT scores and major).
- d. There are no mean differences between rural and urban subjects on their level of indifference in responding on the SII.



- e. There are no mean differences between rural and urban subjects on their profile differentiation scores for the RIASEC scales.

### Subjects

The subjects for this study were 665 students who received services at the University of North Dakota Counseling Center over six academic years (1988-89 through 1993-94). Of the total sample, 36.2% were males ( $n = 241$ ) and 63.8% were females ( $n = 425$ ). The ages of these participants ranged from 18 to 25. The majority of subjects were age 18 to 20. (Subjects older than age 25 were excluded from the sample because the impact of geographic location may be different for them than for subjects in the traditional student age range of 18 to 25. Another reason for exclusion is that the bulk of career literature is based on this age group.) Table 1 summarizes the demographic characteristics of the subjects. The sample included enrolling students as well as students ranging from Freshmen through Graduate/ Professional school. A few subjects were listed as Other because they were neither enrolling nor currently enrolled. Over half the sample were either Freshman or Sophomores. With regard to ethnicity, the vast majority (96.7%) of the subjects participating in the study were Caucasian. The majority of students were enrolled in University College which is assigned when students are undecided about their major. Cumulative grade point average ranges and the percentage of subjects falling into each range are also noted in Table 1.

Table 1

## Demographic Characteristics of the Sample

Variable	Category	n	%
<b>Age</b>			
	18	128	19.2
	19	231	34.7
	20	148	22.3
	21	61	9.2
	22	46	6.9
	23	21	3.2
	24	18	2.7
	25	12	1.8
<b>Class</b>			
	Enrolling	3	0.5
	Freshman	212	33.8
	Sophomore	255	40.6
	Junior	113	18.0
	Senior	38	6.1
	Grad./Professional	2	0.3
	Other	5	0.8
<b>Ethnicity</b>			
	Caucasian	549	96.7
	African-American	2	0.4
	Asian/Pacific Island	3	0.5
	Internat'l Student	4	0.7
	Hispanic	2	0.4
	Native American	3	1.1
	Other	5	0.9
<b>College</b>			
	Arts & Sciences	132	21.3
	Business & Professional	67	10.8
	Aerospace Sciences	28	4.5
	Teaching and Learning	13	2.1
	Engineering & Mines	23	3.7
	Fine Arts	6	1.0
	Graduate School	1	0.2
	Medicine	13	2.1
	Nursing	13	2.1
	University College	303	48.9
	Non-students	9	1.5
	Human Resources/Dev .	11	1.8
<b>Cumulative GPA</b>			
	2.00 & Below	55	8.7
	2.01-2.49	108	16.8
	2.50-2.99	192	30.2
	3.00-3.49	180	28.4
	3.50-4.00	130	15.0

Note. Total n=665.

### Measure and Variables

The principle measure used in this study was the Strong Interest Inventory (SII). The SII is a 325 item self-report career interest inventory containing questions about various occupations, school subjects, leisure activities, types of people and characteristics of the test-taker. Internal consistency reliabilities as well as validity coefficients are reported for all scales in Chapter 2 of this dissertation.

General Occupational Theme Scales. The SII GOT scales reflect each of the six Holland types. The scales are: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). For the General Occupational Themes, test-retest reliabilities range from .85 to .93 for a two week interval and from .78 to .87 for a three year interval (Hansen & Campbell, 1985). Scores are normed to have means of 50 and standard deviations of 10 for a mixed gender norm sample.

Academic Comfort Scale (AC). This scale reflects the level of comfort in academic settings. Scores are normed to have means of 60 and standard deviations of 10 for mixed gender norming samples (Hansen & Campbell, 1985). Scores in the 50's and 60's tend to indicate comfort in higher academic settings such as graduate school. Scores below 40 tend to denote individuals who are more comfortable in applied settings.

Introversion/Extroversion (I/E). This scale is considered an index of a subject's interest in working with things or ideas versus working with people. Scores are normed with means ranging from 48 to 50 for men and women, respectively. Standard deviations range from 10.4 for women to 11.2 for men. Test-retest statistics show that the scale is



relatively stable over time with correlations ranging from .91 to .82 for intervals of two weeks to three years respectively (Hansen & Campbell, 1985).

GPA. This term refers to the cumulative grade point average of the subjects, based on a 4.0 scale. This information was obtained from the student's university files.

ACT. This term refers to the American College Test (ACT) composite score. Like GPA, this information was obtained from the subject's university files.

Rural/Urban Status (Rur/Urb or R/U). The subjects were classified according to hometown population as either rural or urban. The U.S. Bureau of Census definition of rural and urban populations was used to determine this classification (Murray & Keller, 1991). Based on this definition, an urban subject is one from an area in which the city and closely settled surrounding area has 50,000 or more inhabitants. A rural subject, then, is one from an area in which the people live outside of the city and closely inhabited areas and contains less than 50,000 people.

Congruence (Iachan). In order to examine the congruence between a subject's selected college major and his/her three-letter sequentially ordered Holland code (Holland, 1973, 1985) the measure proposed by Iachan (1984, 1990). The Holland code for each subject's major were assigned by the Career Counseling Services at the University of North Dakota's Counseling Center. Then, a computer program was used to calculate Iachan's Congruence Index (Iachan, 1984, 1990) for each subject. Table 2 depicts an adapted version of the scores assigned to the SII GOT and major three-letter Holland codes using the Iachan method (Iachan, 1990, p. 177).

Table 2

Iachan Congruence Index Calculation Codes

Major or Degree Code	SII GOT Code		
	1 <sup>st</sup> Letter	2 <sup>nd</sup> Letter	3 <sup>rd</sup> Letter
1 <sup>st</sup> Letter	22	10	4
2 <sup>nd</sup> Letter	10	5	2
3 <sup>rd</sup> Letter	4	2	1

The resulting Iachan Congruence Index score is a measure of the predictive validity for a subject's SII GOT for college major. Thus, higher Iachan scores indicate higher predictive validity of the SII.

Indifference Z-scores (ZIND:A,B,C,D: ZINDTOT). To examine whether the number of "Indifferent" responses a subject made on selected scales is less than, greater than, or as expected given their scale score, an index called Z-Indifference (coded ZIND) was computed based on the item response theory modeling of SII responses by Henly (1995). This information is of interest because it could be that both rural and urban subjects have similar scale scores, but one group may have a higher or lower number of "Indifferent" responses. For instance, if a rural subject and an urban subject have similar scores on the Artistic theme scale, it would appear that their interests in this area are similar, when in fact the urban subject may have selected more "Dislike" responses and the rural subject

may have chosen more "Indifferent" responses. This index was formulated by first calculating a subject's score on a particular scale. There were four scales for female subjects and three scales for males used to provide information about the number of "Indifferent" responses selected. Once an individual's score on the scale is calculated, then the number of "Indifferent" (or "I") responses that the subject made is compared to the expected number of "I" responses for a subject with that score. A difference score is calculated and then divided by the expected variance of the number of "I" responses at that score level. The score that results is a z-score with a mean of 0.0 and a standard deviation of 1.0. In practical terms, this means that subjects with negative z-scores obtained their scale score by selecting fewer Indifferent responses and therefore, more Like and Dislike responses than would have been expected. The reverse, then, is true for positive z-scores.

Profile Differentiation (ProDif). This score is a measure of differentiation between the highest and lowest GOT scores. It was calculated by computing the variance of the respondent's GOT scores.

#### Procedure

The SII data for this study was archival and obtained from the files at the University of North Dakota's Career Counseling Services. In addition to the SII information, other demographic information was obtained from the subjects' files at the Counseling Center. This included: race/ethnicity, and age. The following information was obtained from the subjects' general university records located in the Office of Student Affairs: hometown and its population, ACT scores, cumulative GPA and college major.



The data from the University Counseling Center and Student Affairs was linked and statistical procedures were applied to analyze the data.

### Analysis

To examine the RIASEC scales, the AC scale, and the I/E scale for mean differences between rural and urban groups, a multivariate analysis of variance was conducted separately for each gender because the assumption of equivalent variance-covariance matrices was violated, likely due to restricted variance for females on the R scale. In this analysis, rural/urban was used as the independent variable, and the six GOT scores, AC and I/E as dependent variables.

Multiple regression was used to examine whether AC, ACT, Gender or being from a rural or urban environment had an effect on GPA. Two separate equations were formed in which GPA was used as the dependent variable. In the first equation, AC, Gender, and Rural/Urban were used as the independent variables. Also, the relationships were examined for interaction effects between the variables including Gen by AC, R/U by AC, and Gen by R/U. In the second equation, AC, Gender, Rural/Urban and ACT served as independent variables. Also, the relationships were examined for interaction effects between the variables including Gen by AC, Gen by ACT, AC by ACT, R/U by AC, Gen by R/U and R/U by ACT.

A 2 (gender) x 2 (rural/urban) hierarchical analysis of variance was conducted to examine differences between rural and urban subjects on predictor fit as measured by the Iachan congruence index controlling for effects of gender. In this analysis, the Iachan

score served as the dependent variable and gender and rural/urban status were the independent variables.

To examine the differences between rural and urban groups on the Z-indifference scores, independent sample t-tests were used. A total z-indifference score was calculated by summing the z-indifference scores across the scales (ZINTOT). Four scales for women (ZINDA, B, C, and D) and three scales for men (ZINDA, B, and C) were tested. The analyses were run separately for males and females due to the differences between genders in the models for the scales.

A 2 (gender) x 2 (rural/urban) hierarchical analysis of variance was conducted to examine differences and potential interaction effects between gender and rural/urban status on profile differentiation among the RIASEC scales. In this analysis, ProDif served as the dependent variable and gender and rural/urban were the independent variables.

## CHAPTER 4

### Results

The means and standard deviations for GOT scales, AC, IE, ACT, GPA, Iachan congruence index, and Profile Differentiation for rural and urban subjects by gender are summarized in Table 3. In general, the RIASEC scores for rural, urban, male and female subjects would be categorized in the moderately low to average range when compared to those of the general sample upon which the SII was normed (Hansen and Campbell, 1985). The ordering of the GOT scores from highest to lowest is as follows: for rural males, RECSIA; for urban males, ERCASI; for rural females SCEAIR, and for urban females, SECAIR.

The mean AC scores were as follows: rural males,  $\bar{M}=28.4$ ; urban males,  $\bar{M}=27.57$ ; rural females,  $\bar{M}=32.6$ ; and urban females,  $\bar{M}=31.54$ . These scores are all substantially lower than those for the norming sample whose mean was equal to 39 (Hansen and Campbell, 1985). The I/E scores for all four groups are similar to the mean of the norming sample which was  $\bar{M}=53$  (Hansen and Campbell, 1985). The I/E mean scores are as follows: rural male,  $\bar{M}=55.64$ ; urban male,  $\bar{M}=54.37$ ; rural female,  $\bar{M}=50.59$ , and urban female  $\bar{M}=54.37$ .

The results of the multivariate analysis of variance run on the female sample indicated that there were no significant differences between rural and urban groups on any of the



GOT scales for R, I, A, S, E, C, or on the AC and I/E scales ( $F=.891$ ,  $p<.50$ ). The results of the multivariate analysis of variance for the sample of males indicated that there were

Table 3

Sample Means and Standard Deviations on SII Scales and for ACT, GPA, Iachan

Congruence Index Scores, and Profile Differentiation Scores

Variable	Total Sample		Males				Females			
	(n=665)		Rural		Urban		Rural		Urban	
	M	SD	(n=116)		(n=125)		(n=231)		(n=193)	
			M	SD	M	SD	M	SD	M	SD
R	41.69	9.61	48.88	9.85	47.31	9.73	38.44	7.73	37.61	6.88
I	41.12	9.18	42.42	9.94	42.47	9.36	40.30	8.93	40.44	8.76
A	42.96	10.65	39.60	11.01	40.68	10.68	44.62	10.54	44.47	9.87
S	49.38	10.12	45.15	10.33	46.07	9.45	51.37	10.02	51.69	9.17
E	48.07	10.21	47.59	10.37	49.78	10.91	47.77	10.24	47.62	9.54
C	47.34	10.29	45.62	9.49	46.69	10.09	48.82	10.61	47.02	10.33
AC	30.61	14.64	28.40	13.99	27.57	16.13	32.60	13.92	31.54	14.45
IE	52.13	11.65	55.64	12.41	54.37	11.28	50.59	11.55	50.40	10.88
ACT	22.12	4.13	22.57	4.28	20.54	4.09	22.91	3.92	21.72	4.06
GPA	2.85	.64	2.80	.64	2.67	.59	3.04	.59	2.77	.66
Iachan	14.88	8.13	13.77	8.11	13.84	7.89	15.05	8.12	16.06	8.19
ProDif	90.58	56.86	86.32	53.62	85.39	59.54	93.73	56.04	92.71	57.97

no significant differences between the rural and urban groups on any of the scales

( $F=.885$ ,  $p<.50$ ). So, in this case, the null hypothesis was retained. The means and standard deviations are reported in Table 3.

Multiple regression was used to examine whether GPA could be predicted by AC, gender or by geographical category of rural/urban. Test results indicate that gender and AC contribute to the prediction of GPA ( $F=17.11, p \leq .01$ ). Further, addition of rural-urban status significantly improved prediction of GPA. None of the interaction terms in the model was significant, indicating that the relationship between AC and GPA does not differ for gender or rural-urban subgroups. The results are reported in Table 4.

For those subjects for whom ACT scores were available, multiple regression was also used to examine whether GPA could be predicted by AC, gender, rural/urban and ACT score. Results of the analysis indicate that only AC, Gen, and ACT contribute to the prediction of GPA as evidenced by  $F = 25.81, p \leq .000$ . It should be noted that when ACT scores are added to the equation, the effect of rural/urban disappears, either as an additive or interactive effect. The potent impact of rural/urban in the first regression equation may be impacted in the second equation by the sizeable differences in ACT scores between rural and urban students (rural students scored a half standard deviation higher). The results are reported in Table 5.

The results of the 2x2 hierarchical analysis of variance which measured predictor fit between selected college major and the RIASEC scales (the Iachan index) for each subject indicated that there were no significant differences between rural and urban subjects. However, significant differences did exist between genders, with females tending to have greater congruence between their SII type and their college major ( $F(1, 665)=5.758, p \leq .017$ ). There was no interaction effect between rural/urban status and gender. The results are reported in Table 6.

Table 4

Summary of Hierarchical Regression Analysis for Variables Predicting GPA-Equation 1

Variable	<u>B</u>	<u>SE B</u>	<u><math>\beta</math></u>	<u><math>\Delta R^2</math></u>	<u>F<sup>a</sup></u>	<u>p</u>	<u>df</u>
Step 1				.051	17.11	$\leq .001$	2,632
AC	.008	.002	.180*				
Gender	.152	.052	.115*				
Step 2				.000	.01	ns	3,631
AC	.007	.006	.167				
Gender	.142	.115	.108				
GenXAC	.000	.004	.016				
Step 3				.026	17.62	$\leq .01$	4,630
AC	.007	.006	.164				
Gender	.132	.113	.100				
GenXAC	.000	.004	.014				
Rur/Urb	-.205	.049	-.161				
Step 4				.005	1.05	ns	6,628
AC	.011	.008	.245				
Gender	.330	.191	.250				
GenXAC	.000	.004	-.003				
Rur/Urb	.061	.190	.048				
R/UXAC	-.002	.003	-.086				
GenXR/U	-.123	.102	-.215				

Note. F<sup>a</sup> is for change due to addition of variables in step.

<sup>a</sup>\*  $p \leq .05$ .



Table 5

Summary of Hierarchical Regression Analysis for Variables Predicting GPA-Equation 2

Variable	B	SE B	$\beta$	$\Delta R^2$	F <sup>a</sup>	p	df
Step 1				.312	25.81	$\leq .001$	3,171
AC	-.003	.003	-.069				
Gender	.235	.069	.219*				
ACT	.052	.007	.514*				
Step 2				.005	.43	ns	6,168
AC	-.016	.014	-.421				
Gender	.167	.289	.156				
ACT	.040	.243	.402				
GenXAC	.003	.005	.160				
GenXACT	-.000	.015	-.023				
ACXACT	.000	.000	.306				
Step 3				.000	.02	ns	7,167
AC	-.017	.014	-.424				
Gender	.168	.290	.156				
ACT	.040	.025	.400				
GenXAC	.003	.005	.169				
GenXACT	-.000	.015	-.024				
ACXACT	.000	.000	.313				
Rur/Urb	-.011	.070	-.010				

	B	SE B	$\beta$	$\Delta R^2$	$F^a$	p	df
Step 4				.019	1.52	ns	10,164
AC	-.038	.018	-.994*				
Gender	.360	.403	.335				
ACT	.059	.036	.591				
GenXAC	.005	.006	.268				
GenXACT	-.004	.016	-.113				
ACXACT	.000	.000	.378				
Rur/Urb	.093	.370	.089				
R/UXAC	.011	.006	.536*				
GenXR/U	-.114	.143	-.230				
R/UXACT	-.012	.015	-.265				

Note.  $F^a$  is for change in R due to variables added at step.

$^a p \leq .05$

Table 6

Analysis of Variance for the Iachan Index of Congruence by  
Gender and Rural/Urban Status

Source of Variation	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
<u>Main Effects</u>	440.03	2	220.01	3.354	.036
Gender	377.73	1	377.73	5.758	.017
Rural/Urban	62.30	1	62.30	.950	ns
<u>2-way Interactions</u>					
Gender x Rur/Urb	28.85	1	28.85	.440	ns
Explained	468.88	3	156.29	2.383	ns
Residual	37324.86	569	65.60		
Total	37793.73	572	66.07		

Note. 92 cases had missing data.

The results for the analysis of Z-indifference are listed in Table 7. The analysis using t-tests for independent samples indicated that there were no significant differences between rural and urban groups on any of the ZIND measures for women or men.

When examining mean differences between groups for profile differentiation in the RIASEC scores, the results of the 2x2 hierarchical analysis of variance indicated that there were no significant differences between rural and urban subjects or between genders. There also was no interaction effect between rural/urban and gender on this measure.



Table 7

Results of Independent t-tests for z-indifference Scores

Variable	<u>Female</u>						<u>Male</u>					
	<u>Rural</u>			<u>Urban</u>			<u>Rural</u>			<u>Urban</u>		
	<u>n</u>	<u>M/(SD)</u>	<u>n</u>	<u>M/(SD)</u>	<u>t</u>	<u>p</u>	<u>n</u>	<u>M/(SD)</u>	<u>n</u>	<u>M/(SD)</u>	<u>t</u>	<u>p</u>
ZIND A	212	-.03 (1.73)	180	-.07 (1.83)	.24	.81	105	-.19 (1.53)	116	-.14 (1.50)	-.26	.80
ZIND B	211	.01 (1.53)	180	-.17 (1.62)	1.10	.27	105	.08 (1.60)	114	-.06 (1.50)	.62	.53
ZIND C	155	-.03 (0.94)	133	-.09 (0.87)	.53	.60	100	-.15 (1.32)	107	.04 (1.50)	-.99	.32
ZIND D	203	.10 (1.34)	167	.10 (1.45)	-.05	.96						
ZINTOT	155	.16 (3.45)	133	-.28 (3.35)	1.11	.27	100	-.21 (3.65)	105	.05 (3.53)	-.52	.61

## CHAPTER 5

### Discussion

The purpose of this study was to explore whether differences existed between rural and urban geographical groups on the GOT scales, AC, and I/E of the SII for a sample of college counseling center students at the University of North Dakota. An additional focus of the study was determining whether cumulative GPA could be predicted by variables such as gender, AC, rural/urban, ACT, or interactions among them. Additional rural/urban differences were explored on Iachan measures of congruence between college major and GOT scores, for scales measuring the level of indifference in responding on the SII, and on the degree of differentiation among a subject's GOT scores. Also, because of literature support for differences between genders on different facets of the SII, this was examined in several analyses as well.

Overall, the findings in this study seem to indicate that there are no significant differences between rural and urban subjects on AC, I/E, any of the RIASEC scales, on the Iachan measure of predictor fit between the RIASEC scales and selected college major, on measures of z-indifference or on the levels of profile differentiation. In light of the researcher's practical experience, these results are surprising. Reflection upon these findings leads to several hypotheses.

First, it could be that there are, in fact, no real differences between rural and urban subjects career interests as measured by the SII. While there is no published literature to date comparing these two cultural groups, there is research to support the efficacy of the SII for various other cultural groups. The results of the multivariate analysis of variance indicated there were no mean differences between rural and urban subjects on any of the RIASEC scales, AC or I/E. The findings of this study are similar to the data obtained by Montoya and DeBlassie (1985), who found no significant differences on the GOT's and the I/E scale between a sample of Anglo and Hispanic students. Tomlinson and Evans-Hughs (1991) also found no differences between groups of White, Black and Hispanic college students on any GOT scales.

Another hypothesis about the lack of differences between the groups is that the results were affected because this sample was strictly drawn from students seeking career counseling services at the UND Counseling Center. Indeed, Tryon (1983) found differences in certain SII scores between students seeking counseling services and students in the general college population. In reality, perhaps differences do exist between rural and urban students on the SII for a general college sample. However, at the time of this research, only SII's from a counseled population were available. It would be important in future research to obtain data from both counseled and non-counseled populations to see if this factor has an effect on the mean scores of rural and urban students on the GOT's, AC and I/E.

The results of the first multiple regression analysis showed that AC, gender, and rural/urban status all made significant contributions to the prediction of GPA. However,



it should be noted that  $R^2=.08$  indicating that these variables only account for 8% of the explained variance when predicting GPA. In the second multiple regression analysis, when ACT was added into the equation along with AC, gender and the interaction variables,  $R^2$  was equal to .32. This, then, accounted for 32% of the explained variance in predicting GPA. The impact of rural/urban is reduced by the addition of ACT in the second equation. This may be due to sizeable differences between rural and urban students on ACT composite scores. Rural students' scores are half a standard deviation higher. These findings are similar to studies by other researchers who found very modest correlations between AC and GPA (Hansen & Campbell, 1985; Johnson, 1969; Wagman, 1971; Swanson & Hansen, 1985). One could conclude from the results that while AC, gender, ACT and to some extent rural/urban all contribute to the prediction of cumulative GPA, there are many other factors which have an impact. Universities which are investigating such factors for purposes of student selection and retention should consider this.

The data from this study's examination of concurrent validity using the Iachan model to ascertain the level of predictor fit between a subject's RIASEC scores and their college major suggest that the RIASEC scores predict college major equally well for both rural and urban students. These results are similar to those of Whetstone and Hayles (1975) who found that the SVIB predicted career group membership as well for Black males as for White males. The results of this study also support those found by Haviland and Hansen (1987). Their study included both American Indian and Caucasian subjects and concluded that the GOT's were good predictors of college major for both groups.

Also, it should be noted that there were significant differences between males and females when using the Iachan model to measure the fit between the GOT scores and college major. This supports the research of Spokane (1979) who found that concurrent validity for the SII and preferred occupation differed for men and women.

The results of the Independent t-tests examining differences between rural and urban students on selected measures of z-indifference showed no differences between the two groups. The purpose of this analysis rested on the theory that perhaps rural and urban students had different response patterns when responding to the SII which requires selection of "Like," "Indifferent," or "Dislike" to answer each question. This part of the study is relevant to ideas about occupational stereotypes. For instance, Trice (1990) suggested that rural children's career interests are directly related to their parent's careers. Given the restriction of career ranges in the rural environment, it is then likely that interests may also be restricted causing subjects' responses on the SII to also be affected. However, this portion of the study did not support this notion. It is possible that rural and urban students do respond in a differential fashion with respect to "Like" and "Dislike" answers. This aspect would be important to examine in future studies.

The hierarchical analysis of variance used to examine mean differences between rural and urban subjects on profile differentiation between the RIASEC scores yielded results indicating no differences between the two groups or between genders. Again, it should be noted that this sample was taken from students at a college counseling center. Further research should include both counseled and non-counseled students.



The orderings for the GOT scales found in this study were RECSIA for rural males, ERCASI for urban males, SCEAIR for rural females, and SECAIR for urban females. These findings are dissimilar to the orderings of IASCRE and ISACER found by Campbell (1971) and Holland (1973), respectively. Again, the orderings for this study are likely influenced by low AC score which directly affect the scores on I and A.

The mean AC scores for the subjects in this sample are lower than those reported for the norming sample (Hansen & Campbell, 1985). This is consistent with the observations of the researcher during actual career counseling sessions. The mean AC scores for this sample were 27.6 and 32.6 for males and females respectively, and 28.4 to 31.5 for rural and urban subjects, respectively. As noted by Hansen and Campbell, (1985) scores less than 40 on AC are consistent with individuals who typically have only high school educations or who would be more suited for two-year vocational or technical training. Low scores are also indicators of individuals who find intellectual pursuits boring, and who are likely to drop out of college. Given that this sample consisted of career counseling subjects who are in the midst of career indecision, these results are not surprising. It would be interesting to have tracked the educational path of these subjects to see if, indeed, there was any correlation between AC and whether or not the students graduated from college. However, at the time of this study, the latter information was not available.

Also, a finding of this study was the relatively low RIASEC scores, on the average, for the subjects in the study. When RIASEC and AC scores are low, this often results in a profile that is undifferentiated. This finding is consistent with the researcher's



observations that the profiles she observed for the counseled students were, for the most part, low and undifferentiated. Again, this could be due to the fact that all students were coming to the counseling center in the midst of career indecision. If so, this is problematic, because the SII is designed to assist students in this process.

Even so, what accounts for the fact that this sample has relatively low scores? Is it that the pattern of interests for the subjects in this sample is somehow different from the groups on which the test was normed? North Dakotans, upon which this sample is largely based, have long argued that the whole state should be considered rural because of its small population. If that is the case, then perhaps the variables affecting career interest development such as SES, parental occupation, and levels of self-efficacy may have had an effect here. It would be important in future research to include these variables. The possibility also exists that studies conducted in other geographical regions would yield different results. This suggests that the study results were potentially confounded by this factor.

Yet another hypothesis about the lack of mean differences between the rural and urban groups may be related to the population number of 50,000 which was selected, based on the literature, to delineate between them. Possibly, this is not the most appropriate dividing line between the groups. Since the researcher had coded the data for smaller population numbers, it was possible to conduct some post hoc analysis to examine this hypothesis further. Means and standard deviations for rural and urban subjects with different breaks in population levels were examined, but, again, no apparent differences were found.

Obviously, this study was limited because the subjects were strictly from a college counseling center population. An additional problem is that most subjects were from the upper Midwestern region of the United States. A further limitation is that the greatest percentage of participants were Caucasian. All factors affect the generalizability of the results to non-counseled college students, individuals from different geographic regions and from different ethnicities or cultures. However, the purpose of this study was to explore whether there were differences on the SII for rural and urban populations. Although no differences were found for this sample, and given the limitations and exploratory nature of this study, it is an indication that further research into potential rural/urban differences should be conducted in other regions, with more ethnically diverse subjects and for counseled and non-counseled subjects alike.

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