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DISSERTATION

CONVERGENT VALIDITY OF TRUE COLORS™ CHARACTER CARDS' ACTIVITY AND WORD CLUSTER INSTRUMENT WITH THE MYERS-BRIGGS TYPE INDICATOR, STRONG INTEREST INVENTORY, AND CAMPBELL INTEREST AND SKILL SURVEY

Submitted by

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School of Education

In partial fulfillment of the requirements

for the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

Spring 2001

COLORADO STATE UNIVERSITY

27 November, 2000

WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY STEVIE L. HONAKER ENTITLED CONVERGENT VALIDITY OF THE TRUE COLORS™ CHARACTER CARDS ACTIVITY AND WORD CLUSTER INSTRUMENT WITH THE MYERS-BRIGGS TYPE INDICATOR, STRONG INTEREST INVENTORY, AND CAMPBELL INTEREST AND SKILL SURVEY BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work

Advisor

Department Head

ABSTRACT OF DISSERTATION

CONVERGENT VALIDITY OF THE TRUE COLORS™ CHARACTER CARDS' ACTIVITY AND WORD CLUSTER INSTRUMENT WITH THE MYERS-BRIGGS TYPE INDICATOR, STRONG INTEREST INVENTORY, AND CAMPBELL INTEREST AND SKILL SURVEY

With the increased use of the True Colors™ nationally over the last twenty years to date, no manual detailing any psychometric properties has been produced. The purpose of this research was to conduct a convergent validity study of the True Colors™ Character Cards' Activity and Word Cluster Instrument using: the Myers-Briggs Type Indicator (MBTI), Form G, the Strong Interest Inventory (SII), and the Campbell Interest and Skill Survey (CISS).

Subjects completing the 4 assessments consisted of 56 students enrolled in a graduate-level human resource program. Data analyses included one-way ANOVAs, t-test for independent samples, Levene's test for equality of variances, and Spearman Rank Order and Pearsons Product Moment correlations.

Results of the correlations support the convergent validity of True Colors™ Character Cards' Activity and Word Cluster Instrument with the MBTI. However, little support was found for True Colors™ convergent validity with the SII and CISS. Gender differences had no effect on the True Colors™ results. However, gender did prove to effect the Thinking - Feeling dimension of the MBTI. The SII's gender differences were with the Realistic and Enterprising General Occupational Themes. Finally, the CISS's gender differences were with the Creating and Adventuring Orientations.

One implication from this study is that True Colors™ has significant relationships with the MBTI and provides information on how True Colors™ specifically relates to it; however, these relationships do not always follow logical assumptions a professional who has knowledge of both the MBTI and True Colors™ might make. Thus, the findings underscore the need for caution in extrapolating types across different personality assessments.

Also provided is practical application information for using the True Colors™ Character Cards' Activity and Word Cluster Instrument in regard to the fact that these different tools each have an appeal to specific personality types and illicit a participant's confidence and responses differently. The Character Cards' Activity appeals most to Blue and Orange personalities and attracts creative and artistic responses. The Word Cluster Instrument appeals most to Green and Gold personalities and attracts more logical and analytical responses.

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Last, but not least, I am humbly grateful to my Creator, who I believe opened the doors for a displaced, middle-aged homemaker to reenter college after 25 years of absence. Over the course of the last 11 years in full-time attendance, I have been helped to overcome my long-standing fear of tests, math, and statistics, as well as led to find my vocational calling. It is my hope that this dissertation stands as proof to one fact I know to be true -- with enough courage to try, with help from many others, and with continued faith to keep going, your dreams can become your reality.

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CHAPTER ONE

Continual change in the workplace has made effective communication, and the ability to collaborate, critical to professional success. These skills have also created new demands for better leadership. Increased interest in the topics of communication, collaboration, and leadership have produced a proliferating number of speakers, conferences, team-building seminars, and training programs now widely used within business and educational environments.

Evidence on this mainstream phenomena is the fact that the last decade has been punctuated with best selling books by well-known consultants, corporate trainers, and educational researchers, such as: Ken Blanchard's (2000), Understanding Business and Steven R. Covey's (1989), The 7 Habits of Highly Effective People. Each of these respected individuals and many others, in turn, have written a latest best-selling book and developed a companion seminar which, when taken together, comprise annually a billion dollar industry. Often included in their presentations are the use of assessment tools which have been designed to help individuals recognize their interests, values, and behaviors, as well as their communication, personality, management, and leadership styles. Although these presentations' focus and content may represent new approaches, the main assessment tools used to measure the participants' characteristics were developed within the psychological, counseling, and educational fields decades ago.

The purpose of this research is to compare a more recently developed personality assessment, just beginning to be used within the corporate training field, with several of the most widely used and well-researched assessments available. Within the less publicized arenas of consulting, human resources, and career management in business and education,

one of the earlier assessment tools used to increase communication among different personality types has been and still is, the Myers-Briggs Type Indicator (MBTI). First made available in 1962 and originally used by counseling professionals, the MBTI is now widely accepted in other applications for business management, training, team-building, education, and the organizational and career development fields (Bayne, 1995). According to the MBTI Manual (1998), more than two million assessments are used annually around the globe. Other assessments measuring interests such as the Strong Interest Inventory and the Campbell Interest and Skill Survey have also grown in use to become recognized as mainstays within the assessment field. Fifteen years ago Hansen (1984) made an estimate that approximately 3.5 million interest inventories were administered annually, and there appears to be no evidence to suggest a decline in their use (Betz, 1992).

An interest inventory that measures individuals' interests for various occupational placement purposes has been in use since its inception during World War I by the military. Interest inventories are often used in conjunction with personality assessments in order to provide a more complete or composite understanding of an individual's preferences. One of the earliest interest inventories was developed by E. K. Strong in 1927. With a long tradition of continued psychometric verification, this instrument has undergone numerous major revisions to produce the current 1994 Strong Interest Inventory (SII) instrument. The SII measures an individual's interests in specific occupations and preferred work environments, understanding job dissatisfaction, as well as providing information on occupational choices and lifestyle exploration. Westbrook & Norton's (1994) review in A Counselor's Guide to Career Assessment Instruments, deem it "clearly impressive" and

state that "some believe that it is probably the best interest inventory available" (p.217). Another instrument with increasing wide use and application is the Campbell Interest and Skill Survey (CISS), developed by David P. Campbell in 1992. This instrument is designed to measure an individual's interest and attraction for specific occupational areas, as well as provide a measure of one's skills as a self-reported estimate of confidence in one's ability to perform various occupationally-related activities. David Campbell is the Smith Richardson Senior Fellow at the Colorado Springs Center where the Campbell Development Survey in conjunction with the Campbell Organizational Survey and the Campbell Leadership Index comprise the backbone of a much sought-after national corporate management-training program. The Campbell Interest and Skill Survey is a widely used instrument within counseling and career development areas and is employed by high schools, colleges, universities, human resource departments, and placement firms (Fugua & Newman, 1994).

Since the 1980s, a growing number of corporate trainers, counseling professionals, and educators have also been employing another instrument for assessing personality type. Developed by Don Lowry in 1979 and distributed through his company, True Colors ™ Communications Group in Riverside, California, True Colors™ personality types has been used on a national basis in community drug prevention and rehabilitation programs. In Colorado from 1996 to 1999, one of several projects to use True Colors™ consisted of a Trainer of Trainees program. Also, awareness workshops in True Colors™ were provided during a gender equity and career development state initiative funded by the Colorado Community College Occupational Education System (CCCOES), presently known as the

Community Colleges of Colorado (CC of C). Another example for a statewide initiative was the K-12 school climate program held in 200 Tennessee schools from 1989 through 1999. Increasingly, True Colors™ is one of the newer personality assessments to join the ranks of personality assessments and interest inventories that enjoy wide use in a variety of applications within the education, business training, and counseling fields.

The first book presenting the True Colors™ program was by Carolyn Kalil titled Follow Your True Colors™ To The Work You Love. Since its release in 1998, the book has gone into its second printing. A companion workbook was released the following year in November, 1999. According to the book's Marketing Director, J. Gute, (personal communication, December 7, 1999), orders for the book are rapidly increasing. She talked of recent orders from two Fortune 500 corporations, one with 18,000 employees, who recently have started using the book in conjunction with the True Colors™ Character Cards' Activity and Word Cluster Instrument for all the corporation's management training. Another corporation, based in San Jose, California, is using the personality type assessing system and book as part of its training for its new employees.

Statement of the Problem

Even though there has been an increased use of the True Colors™ Character Cards' Activity and Word Cluster Instrument nationally over the last twenty years, to date no manual detailing the instrument's psychometric properties has been produced. Further, research studies involving the instrument's reliability or validity were not found in a comprehensive search of the literature from 1979 to the present. However, the True Colors™ Character Cards' Activity and Word Cluster instrument is described in the

accompanying program training materials and during the introduction of the instrument by trained True Colors™ presenters to audiences and potential respondents as being "loosely based on the MBTI" (Lowry, 1990).

The research problem for this study is to investigate the relationships among the True Colors™ personality types with the Myers-Briggs personality type functions, as well as the interest dimensions of two vocational inventories. The Myers-Briggs Type Indicator (MBTI) is an excellent example of a construct-oriented test inextricably linked to Jung's (1923) theory of psychological types (Wiggins, 1989). The Strong Interest Inventory (SII) has been in use for almost sixty years and is an excellent example of the standard for continual revisions within the interest inventory domain (Busch, 1995). The Campbell Interest and Skill Survey (CISS) is considered to be a valuable addition to the category of empirically key interest inventories (Roszkowski, 1998). These three instruments are well-researched and documented in their respective manuals and in academic journals and will ably serve as credible convergent validity instruments.

The purpose of this research is to conduct a convergent validity study of the True Colors™ Character Cards' Activity and Word Cluster Instrument using the three previously well-established instruments. Therefore, the relationship between the four personality types of True Colors™ and the logically corresponding dimensions from the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey, deemed appropriate by the researcher, will be examined.

Table 1.1 provides the constructs of each of the instruments used in this study along with a brief definition of each construct from the four assessments to be correlated.

All definition terms within Table 1.1 are taken from the Personal Keys to Success (Lowry, 1988) for True Colors™ and from the manuals of the Myers-Briggs Type Indicator (Myers & McCaulley, 1998), the Strong Interest Inventory (Harmon, Hansen, Borgen, & Hammer, 1994), and the Campbell Interest and Skill Survey (Campbell, 1992).

The True Colors™ Character Cards' Activity and Word Cluster Instrument consists of four personality types, which are represented metaphorically by colors labeled as: Blue, Green, Gold, and Orange. The Myers-Briggs Type Indicator is comprised of four dichotomous indicators. Dichotomous indicators are defined in the Myers-Briggs Manual (1998) as being:

> ...different from typical trait approaches to personality that measure variation along a continuum; instead the Indicator seeks to identify a respondent's status on either one or the other of two opposite personality categories, both of which are regarded as neutral in relation to emotional health, intellectual functioning, and psychological functioning. Each of the categories specified in the instrument represents a multifaceted domain of psychological functioning. The assumption is that one of each pair of categories is inherently more appealing than the other to a particular respondent. Thus, the forced-choice format of items is designed to reveal a preference between equally viable mental processes and attitudes (p. 5).

The four dichotomous indicators are: Extraversion - Introversion, Sensing - Intuition, Thinking - Feeling, and Judging - Perceiving. The Strong Interest Inventory's six General Occupational Themes (GOTs) are: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The Campbell Interest and Skill Survey's seven Orientation Scales (OS) are: Producing, Analyzing, Creating, Helping, Influencing, Organizing, and Adventuring.

Table 1.1

Dimensions of the True Colors™ Character Cards' Activity and Word Cluster Instrument Four Personality Types, the Myers-Briggs Type Indicator Dichotomous Scales, the Strong Interest Inventory Six General Occupational Themes, and the Campbell Interest and Skill Survey Seven Orientation Scales

True Colors™ Personality Types	MBTI Dichotomous Functions	SII General Occupational Themes	CISS Orientation Scales
Blue Focus on Harmonious Relationships; compassionate; authentic; warm; communicative.	**Feeling** Value-based decision-making with a consideration for the consequences on others.	**Social** Prefer working with individuals and groups; helping, caring, and nurturing others; teaching; solves problems through feelings and interaction with others.	**Helping** Aiding others through teaching, healing, and counseling; value compassion, interpersonal harmony; nurturing and enjoy solving human problems; giving service to others.
Green Curious; seeking; inventive; theoretical; complex; Philosophical; principled; rational.	**Thinking** Logical-based decision-making with inquiry; consideration for fairness; cause and effect.	**Investigative** Prefer academic/scientific ideas, data, things, working alone; gathering and analyzing new data and theories; value curiosity.	**Analyzing** Analyzing data using mathematics and carrying out scientific experiments.
Gold Organized; conventional; orderly; procedural; practical; responsible; tradition; loyal.	**Judging** Prefer to plan ahead to avoid stresses/changes at the last minute; organized.	**Conventional** Prefer organizing, detail, accuracy math, data, management, work well in large corporations; value stability.	**Organizing** Organizes the work of others; managing and monitoring financial performance.
Orange Active; realistic; daring; Spontaneous; Opportunistic.	**Perceiving** A high value for spontaneity; open and adaptable to change.	**Realistic** Prefer outdoors and working with tools; prefer action concrete problems; higher risk-taking; value tradition, common sense.	**Producing** Like to produce products using hands-on skills in farming, gardening, construction and mechanical crafts.
	Sensing Focusing mainly on what can be perceived by the five senses; attending to facts that are observable.	**Enterprising** Prefer persuading, managing, and selling; motivating and directing; value risk-taking, competition.	**Influencing** Like to make things happen; negotiate and debate; take charge; direct others; set policies and motivate.
	Intuition Focus on perceiving patterns and interrelationships; attend to meanings and possibilities.	**Artistic** Focus on self-expression, aesthetics, and art; creative; value originality, independence, imagination and beauty.	**Creative** Inventive, clever and imaginative; value self-expression and independence; designing, creative activities.
	Extraversion Directing energy mainly toward the outer world of people and objects.		**Adventuring** Focus on activities involving risk-taking, teamwork; value physical challenges and competitive outlets.
	Introversion Directing energy mainly toward the inner world of experiences and ideas.		

Note. Excerpted from Personal Keys to Success Lowry (1988), MBTI Manual (1998), SII Manual (1994), & CISS Manual (1992).

Hypotheses

The following hypotheses will guide the course of this proposed study.

Hypothesis 1. There is a positive association between True Colors™ personality type of Blue and the MBTI Feeling, the SII Social, and the CISS Helping domains.

The True Colors™ Blue personality type scores range from 5 to 20. The Myers-Briggs Type Indicator's Feeling dimension's dichotomous scores range from 0 to 70, which are converted to positive continuous scores for correlational research by adding 100 to the preference score. The Strong Interest Inventory's Social and the Campbell's Helping dimensions are continuous scores with a range of 0 to 100. Thus, this hypothesis will be supported if correlations prove to be high and positive.

Hypothesis 2. There is a negative association between True Colors™ personality type of Green and the MBTI Thinking and positive associations between the SII Realistic, and the CISS Analyzing domains.

The True Colors™ Green personality type scores range from 5 to 20. The Myers-Briggs Type Indicator's Thinking dimension's dichotomous scores range from 0 to 70, which are converted to negative continuous scores for correlational research by subtracting the preference score from 100. The Strong Interest Inventory's Realistic and the Campbell's Analyzing dimensions are continuous scores with a range of 0 to 100. Thus, this hypothesis will be supported if correlations prove to be high and negative with the Myers-Briggs Type Indicator.

Hypothesis 3. There is a negative association between True Colors™ personality type of Gold and the MBTI Judging and positive associations between the SII Conventional, and the CISS Organizing domains.

The True Colors™ Gold personality type scores range from 5 to 20. The Myers-Briggs Type Indicator's Judging dimension's dichotomous scores range from 0 to 70, which are converted to negative continuous scores for correlational research by subtracting the preference score from 100. The Strong Interest Inventory's Conventional and the Campbell's Organizing dimensions are continuous scores with a range of 0 to 100. Thus, this hypothesis will be supported if correlations prove to be high and negative with the Myers-Briggs Type Indicator.

Hypothesis 4. There is a positive association between True Colors™ personality type of Orange and the MBTI Perceiving, the SII Artistic, and the CISS Adventuring domains.

The True Colors™ Orange personality type scores range from 5 to 20. The Myers-Briggs Type Indicator's Perceiving dimension's dichotomous scores range from 0 to 70, which are converted to positive continuous scores for correlational research by adding 100 to the preference score. The Strong Interest Inventory's Artistic and the Campbell's Adventuring dimensions are continuous scores with a range of 0 to 100. Thus, this hypothesis will be supported if correlations prove to be high and positive. Table 1.2 provides the constructs of the variables used in the hypotheses and graphically displays the expected correlational associations. The review of literature provided the designated alignment of some variables and elimination of other variables from the hypotheses.

Table 1.2

Proposed Comparisons of Dimensions from the True Colors™ Character Cards' Activity and Word Cluster Instrument Four Personality Types, the Myers-Briggs Type Indicator Dichotomous Scales, the Strong Interest Inventory General Occupational Themes, and the Campbell Interest and Skill Survey Orientation Scales

True Colors™ Personality Types	MBTI Dichotomous Functions	SII General Occupational Themes	CISS Orientation Scales
Blue Focus on harmonious relationships; compassionate; authentic; warm; communicative.	**Feeling** Value-based decision-making with a consideration for the consequences on others.	**Social** Prefer working with individuals and groups; helping, caring, and nurturing others; teaching; solves problems through feelings and interaction with others.	**Helping** Aiding others through teaching, healing, and counseling; value compassion, interpersonal harmony; nurturing and enjoy solving human problems; giving service to others.
Green Curious; seeking; inventive; theoretical; complex; philosophical; principled; rational.	**Thinking** Logical-based decision-making with a inquiry; consideration for fairness; cause and effect.	**Realistic** Prefer outdoors and working with tools; prefer action concrete problems; highter risk-taking; value tradition, common sense.	**Analyzing** Analyzing data using mathematics and carrying out scientific experiments.
Gold Organized; conventional; orderly; procedural; practical; responsible; tradition; loyal.	**Judging** Prefer to plan ahead to avoid stresses/changes at the last minute; organized.	**Conventional** Prefer organizing, detail, accuracy math, data, management, work well in large corporations; value stability.	**Organizing** Organizing the work of others; managing and monitoring financial performance.
Orange Active; realistic; daring; spontaneous; opportunistic.	**Perceiving** A high value for spontaneity; open and adaptable to change.	**Artisitc** Focus on self-expression, aesthetics and art; creative; value originality, independence, imagination and beauty.	**Adventuring** Focus on activities involving risk-taking, teamwork; value physical challenges and competitive outlets; are energized by strenuous or dangerous situations.

Note. Excerpted from Personal Keys to Success Lowry (1988), MBTI Manual (1998), SII Manual (1994), & CISS Manual (1992).

Delimitations

The delimitation for this study will be that the participants were enrolled in the same graduate-level career development course offered from 1998 to 1999, during three different classes in three consecutive semesters.

In the selection of instruments to use for this study other well-validated personality assessments using continuous scores, rather than dichotomous scores used by the

Myers-Briggs, are considered to be better forms of personality measurement within the clinical psychology field. If the data in this study were not archival personality assessments with continuous scales would have been used (Aiken, 1996).

Assumptions

Although the investigator was unable to be present in each of the study's three courses at the time participants were given explanations and instructions on taking each of the instruments used in this study, it is assumed that the professor conducting the class and its subsequent use of the instruments in this study were properly explained and administered. It is also assumed that the participants responses on all instruments were an accurate accounting of their preferences and interests.

Limitations

There are some limitations to the findings of this study. The first limitation deals with the fact that the datum collected for this study was archival. If the data had been collected with this study in mind, collection of every score on the Word Cluster Instrument instead of only the total scores for each type would have strengthened the intercorrelation results between the True Colors™ Character Cards' Activity and the Word Cluster Instrument. Secondly, the graduate students were recruited from a particular degree program, Human Resource Development and from a particular course, Career and Employment Concepts which resulted in a convenience sample chosen from an accessible population that is not representative of the general population. The third limitation deals with the size of the sample for this study, which could be considered small for a study involving the establishment of an instrument's convergent validity

demonstrated by the review of literature in which similar convergent studies contained population samples closer to 100 respondents.

Significance of the Study

For more than fifty years, personality type and its relationship to vocational interest have been investigated by researchers. Although there are many personality and vocational interest assessments, the most widely used and well-established are the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey. These assessments have established credibility through considerable reliability, validity, and applications research. However, in the case of the True Colors™ Character Cards' Activity and Word Cluster Instrument, no reliability or validity study has been conducted. This is surprising since it has been used within educational systems and more recently in business spheres for more than twenty years. Therefore, the findings of this study are expected to be of practical value for those professionals using True Colors™ in the spheres of counseling, education, and business by demonstrating to professionals the True Colors™ relationship to or uniqueness from other well-known and used assessments. Secondly, the research findings of this study are expected to be relevant to the four concepts of True Colors™ personality types as the study begins the task of defining these personality types in relation to other significant instruments of personality typing and vocational interests.

Definition of Terms

The following definitions are paraphrased and quoted from sources within the literature review section of this study and are taken from instrument manuals and from the

accompanying explanations of the True Colors™ materials in order to augment an understanding of Jung's complex personality theory as the underlying foundation for the related Myers-Briggs instrumentation.

Campbell Interest and Skill Survey: Developed and introduced in the late 1980s by David P. Campbell, this instrument is a free-choice, self-report survey consisting of 200 interest items indicating the strength of attraction for each occupational area and 120 skill items, which provide an estimate of self-confidence in performing well in a specified area (CISS Manual, 1992, p. 2).

Concurrent Validity: Defined by Shelley & Cohen, (1986), in Testing Psychological Tests as "an attempt to assess a test's validity by comparing how subjects do it as against their performance on other tests" (p. 82). The Strong Interest Inventory Manual's definition is, "...the power of a psychological measure to discriminate between two groups whose behavior at the same point in time differs" (p. 91).

Convergent Validity: Defined by Krathwohl, (1998), in Methods of Educational and Social Science Research as a purpose "to show the test has strong positive correlations with other measures of the construct and smaller positive ones with those related to the construct (convergent evidence); has low or zero correlations with measures of variables not related and negative correlations with those inversely related (discriminant evidence)" (p. 434).

General Occupational Themes: The six broadest themes for the Strong Interest Inventory consisting of Realistic, Investigative, Artistic, Social, Enterprising, and Conventional scales which are based on Holland's (1959) occupational classification

system of six basic categories of occupational interests carrying the same labels and often referred to as the RIASEC order (SII Manual, 1994, p. 44).

Interest Inventories: A measure of individual choices, as well as affinities or aversions toward present or future types of activities they like or dislike, such as a preference for certain vocations (Zeidner & Most, 1992).

Myers and Briggs' Assumptions: Using Jung's (1923) Psychological Types as a confirmation of their personality type research, it was assumed each individual had "true preferences" on each of the Jungian dichotomies and that individuals would be able to report those preferences if given the opportunity to use an appropriate instrument.

Myers-Briggs Type Indicator: A forced-choice, psychological instrument concerned primarily with variations in normal attitudes and behavior designed with the purpose of implementing Jung's (1923) theory of type as a counseling tool for self-understanding and in career planning (McCaulley, 1981). Myers (1962) in the MBTI Manual stated that each of the four dichotomous and directional indicators of Extraversion - Introversion, Sensing - Intuition, Thinking - Feeling, and Judging - Perceiving has been designed to reflect a "habitual choice between opposites, analogous to right- or left-handedness" (p. 2).

MBTI Extraversion: This orientation to life is characterized by an individual's energy flow being directed or focused on the outer world of objects and people within the environment, with correspondingly less energy available for inner experiences and reflection (MBTI Manual, p. 26).

MBTI Introversion: In this life orientation, energy is drawn from the environment toward the inner experience and reflection with a desire to stay focused on the internal, subjective state in the world of concepts, ideas, and inner experiences (MBTI Manual, p. 26).

MBTI Thinking: From the dichotomous scale of decision-making, Thinking refers to a preference of "basing conclusions on logical analysis with a focus on objectivity and detachment" (MBTI Manual, p. 6).

MBTI Feeling: From the dichotomous scale dealing with decision-making processes, Feeling refers to a preference of "basing conclusions on personal or social values with a focus on understanding and harmony" (MBTI Manual, p. 6.).

MBTI Sensing: From the dichotomous scale of sensing - intuition, this preference deals with how an individual prefers to perceive the environment. Sensing refers to a preference for "attending to observable facts or events through one or more of the five senses" (MBTI Manual, p. 6).

MBTI Intuitive: From the dichotomous scale of perceiving, Intuition refers to a preference for "attending to meanings, relationships, and/or possibilities that have been worked out beyond the reach of the conscious mind" (MBTI Manual, p. 6).

MBTI Judging: From the dichotomous scale of orientation to the external/internal world developed by Katherine Briggs and not Jung, Judging refers to a preference for "seeking closure, planning operations or organizing activities" (MBTI Manual, p. 26).

MBTI Perceiving: From the dichotomous scale of orientation to the external/internal world developed by Katherine Briggs, not Jung, Perceiving individuals

"seem in their outer behavior to be spontaneous, curious, adaptable, and open to what is new and changeable in an effort to receive information as long as possible, in an effort to miss nothing that might be important" (MBTI Manual, p. 27).

Personality Inventory: "A self-report inventory or questionnaire consisting of statements concerned with personal characteristics and behaviors... on a multiple-choice or forced-choice inventory, the respondent selects the statements that are self-descriptive" (Aiken, 1996).

Personality Trait: More narrowly defined than type, personality trait is a "predisposition to respond in a particular way to persons, objects, or situations" (Aiken, 1996).

Personality Test: An instrument, usually forced choice, requiring affective responses to gauge a unique and relatively stable disposition to react in a way to a given situation (Zeidner & Most, 1992).

Personality Type: "A characteristic specimen of a general attitude occurring in many individual forms" (Jung, 1921/1971). One of sixteen possible classifications determined by an individual's choice of preferences from a personality assessment (MBTI Manual, 1998).

Preference: In Myers and Briggs' writings, a preferred function of personality developed from two possibilities within each of four dichotomous pairs: extraversion - introversion, sensing - intuition, feeling - thinking, and judging - perceiving.

Strong Interest Inventory: One of the first interest inventories to be developed and introduced 1927 by E. K. Strong as the Strong Vocational Interest Blanks (SVIB) with

the most current revision completed in 1994. It consists of a forced-choice 317 item questionnaire inquiring into a respondent's level of interest in a wide range of familiar occupations and related activities, hobbies, leisure activities, school subjects and types of people. An individual's results are compared with results of occupational norm groups for similarities and differences.

Type Theory: A separate system for explaining personality from Temperament Theory, Type Theory proposes 16 categories for completeness, with many more commonalties among the types than are proposed in temperament theory, in order to identify individuals with basic observable differences which distinguishes them as an identifiable group.

Typology: The systematic categorizing of individuals into predetermined groups according to each system's theoretical foundation.

True Colors™ Blue: Individuals who experience esteem by being authentic; values include: honesty, sincerity, caring, and nuturing others; individuals who gain optimum satisfaction from harmony and unity with others.

True Colors™ Green: Individuals who experience esteem by being curious, ingenious, analytical, creating new ideas, concepts, and inventions, design, and models; values solving problems, logic, fairness and justice and achieving intellectually.

True Colors™ Gold: Individuals who experience esteem by being responsible, useful, and punctual; values loyalty, dependability, belonging, family and tradition and order.

True Colors™ Orange: Individuals who experience esteem by acting in the moment, doing things requiring variety and excitement; values applying skills through the use of tools; values using physical coordination abilities; often described as being adventurous.

True Colors™ Character Cards' Activity: A self-report activity, and for the purposes of this study, forced-choice determination of one's personality type in which an individual is asked to rank the four cards first, second, third, and fourth. Each card represents one of the four possible colors or personality types.

True Colors™ Word Cluster Instrument: A self-report, self-scorable, Likert scale instrument in which individuals are asked to rank five sets of adjectives (for example, loyal, conservative, organized) for each of the four personality types according to those most like the subject with a score of 4, to those least like the subject with a score of 1. The possible range of scores for any one personality type is 0 to 20.

CHAPTER TWO

This chapter presents a theoretical review and an integrative literature review (Cooper, 1984) in order to construct a solid foundation for examining the association of True Colors™ to an established personality indicator and two interest inventories. The decision to use these three instruments, along with the True Colors™ Character Cards' Activity and Word Cluster Instrument, for this study was based on a fifty year tradition within the psychological discipline of investigating the relationship between personality types and vocational interests. The first section of this chapter is a theoretical review of personality type theory and is organized into four sections: (1) history and timeline of personality typology development, (2) Jung's personality typology theory, (3) Myers and Briggs' typology theory, and (4) True Colors personality type theory. The second section of this chapter is a current literature review organized into four sections consisting of: (1) the True Colors™ Character Cards' Activity and Word Cluster Instrument, (2) the Myers-Briggs Type Indicator, (3) the Strong Interest Inventory, and (4) the Campbell Interest and Skill Survey.

Part One: Theoretical Review

History and Timeline of Personality Typology Development

Early attempts to categorize human personality can be found in the writings of Hippocrates (460-377 B.C.) along with other physiognomists who searched for the hidden logic of personality differences in varying facial, head, and physiological traits. Hippocrates proposed a humoral theory to explain the cause of disease based on four natural "humors:" blood, black and yellow bile, and phelgm as opposed to supernatural causes. He also devised the first formal system of classifying mental disorders with the

major categories of mania (overexcitability), melancholia (depression), and phrentitis (brain fever) (Aiken, 1996).

Other ancient Greeks interested in human characteristics, such as Plato (c 428-347 B.C.) and Aristotle (384-322 B.C.), continued the inquiry into human nature with much to say about the subject of human differences. The writing of Theosprastus (372-287 B.C.), which contained thirty sketches or descriptions of character types is of particular interest to the field of personality assessment. Based on the over generalized observation of human behavior, similar to the Hippocrates' Humors Theory, Theophrastus' sketches of character types described the dominant characteristics and behavioral styles of certain types of individuals, including the Flatterer, the Liar, the Penurious Man (a miser), the Surly Man, and the Tasteless Man. Although Theophrastus gave no scientific evidence for the different character types, his sketches were thought provoking (Aiken, 1996) and perhaps served to carry the idea of distinct personality types further.

Later the concept of distinct personality types was continued by Galen (c130-c200 A.D.), a famous Roman physician, who subscribed to Hippocrates' idea of the four humors causing disease. Galen elaborated on the personality characteristics using the four humors as a basis for the development of his Humoral Theory of Temperament. The theory, like Hippocrates' "humors," was based on a belief that an excess of phlegm and bile within the body produced the four basic temperament types: (1) individuals with a sanguine temperament has an excess of blood causing them to act forceful, direct, and courageous; (2) individuals with a melancholic temperament has a predominance of black bile causing them to be generally moody, thoughtfully sad, and withdrawing; (3)

individuals with a choleric temperament has an excess of yellow bile causing them to be easily angered, resentful, and bitter; and (4) individuals with a phlegmatic temperament caused by an excess of phlegm in the body is thought to be weak, indecisive, or sluggish. It is interesting to note Galen's theory was later incorporated by Hans Eysenck (1967), a prominent personality trait theorist, into a system categorizing thirty-two personality traits according to Galen's four temperament types. In Eysenck's (1967) two dimensional classification of personality, the correspondence of Galen's types is: (1) melancholic to unstable introvert; (2) sanguine to stable extrovert; (3) choleric to unstable extrovert; and (4) phlegmatic to stable introvert personalities.

The determination of personality types was relegated to, perhaps the best known or most fashionable at the time, pseudo-science of phrenology or relating bumps on the skull to personality, developed by F. Gall and J. Spurhheim in 1800 (Aiken, 1996). The theory of various kinds of bodily physiology: endomorph, ectomorph, mesomorph, and somatotype determining an individual's personality also survived into modern time (Sheldon & Stevens, 1942) although new quasi-scientific efforts and early medical treatments had begun to be developed, which later became the more accepted method. After the French Revolution, Phillippe Pinel adopted a more humane approach to the mentally ill and instituted reforms throughout France's mental hospitals, which eventually spread throughout Europe. By the end of the nineteenth century, psychology had become a science with the study of behavior and mental processes well underway.

Francis Galton (1822-1911), an English scientist, devised methods for measuring the variables of good temper, optimism and other character traits in 1884 and proposed a

technique of word association for assessing personality. The word association work of Galton, as well as the work of Thorndike in 1912, contributed to the intellectual beginnings of the vocational interest measurement field in the early 1920s (Donnay, 1997).

In 1896, Emil Kraepeling, a German psychiatrist, became famous for a new classification system of mental disorders into organic versus functional and psychoneurotic versus psychotic categories. He also developed another word association technique. In 1905, Carl G. Jung used Kraepeling's word-association tests for the analysis of mental complexes and in the same year, the Binet-Simon Scale for intelligence testing was first published. The work of Kraepeling and German neurologist, Richard von Krafft-Ebing (1840-1902), and other psychiatrists during the late nineteenth and early twentieth centuries, produced the framework used for the development of the Rorschach Inkblot Test in 1920 and the Minnesota Multiphasic Personality Inventory (MMPI), published in 1943. However, the first standardized personality inventory published in 1921 was R. Woodworth's Personal Data Sheet used to screen U. S. Army recruits for emotional disorders. This paper-and-pencil inventory was developed to standardize the psychiatric interview into a single-score inventory. It was not until 1942, using her knowledge of Jung's theory, that Isabel Myers began to develop for the next fifteen years what would later become the Myers-Briggs Type Indicator (McCaulley, 1981). Her mother, Katherine C. Briggs, had begun the painstaking work of developing a personality typology in the early 1900's.

Dissimilar to inventories measuring personality, which were developed to measure maladjustment or mental disorder, measures of interests rose within the context of

vocational counseling. Interests also relate to values, attitudes, beliefs, opinions, sentiments, personal orientations and many other psychological variables. The interest questionnaire developed by James Miner in 1915 was the beginning of criterion and content-validated interests measures, which prompted Clarence S. Yoakum to hold a seminar that same year concerning the use of paper-and-pencil questionnaires that differentiated people into various occupations at the Carnegie Institute of Technology. One of the many researchers in attendance was E. K. Strong, Jr., who constructed a standardized interest inventory -- the Strong Vocational Interest Blank in 1927.

Forer (1948) seems to be the first to have constructed a personality inventory comprised of items dealing with interests and activities. Darley and Hagenah (1955) viewed interests as "expressions of deep-seated individual needs and personality traits" and Super (1972) emphasized the fact that "interests become differentiated in the process of personality development, and consequently interest inventories are actually measures of personality" (Aiken, 1996). The next section will describe the foundation of the theory of personality types later used to develop the Myers-Briggs Type Indicator. Jung's and Myer's basic concepts, terminology, and preference variables are included at the beginning as a means of aiding the understanding of complex theories.

Jung's Personality Typology Theory

Twenty-five centuries following the Greeks efforts to understand human temperament, Carl Gustav Jung (1875-1961), a Swiss psychiatrist, carried the theory of temperament type into the modern time. Jung's (1912) Symbols of Transformation declared his departure from Freud's pansexual explanation for the origins of personality

development. In The Encyclopedic Dictionary of Psychology, Harre & Lamb (1983) stated that in his quest for a framework in which to explain personality manifestations, Jung chose a "topological schema which, because of its empirical possibilities, has had more impact in academic psychological circles than any other aspect of his theoretical work" (p. 323).

Jung's prolific writing over a time span of fifty years, reside in twenty volumes of his collected works. However, none are devoted to the presentation of a systematic theory; rather Jung's letter to Erich A. Von Fange in August 1960 stated his intent was to provide a "means and ways by which I could express in a comprehensible way the peculiarities of an individual psyche and the functional interplay of its elements" (McCaulley, 1998). His focus was primarily on the practice of psychotherapy and providing a common means of communication in his practice and with other professionals. However, in Jung's (1923) Psychological Types, he "attempted to bring order into the diversity presented by individual differences in personality through the delineation of a conceptual model which included two basic attitudes and four essential psychological functions common to humankind" (Harre & Lamb, 1996).

The Attitudes: Extraversion and Introversion. A major portion of Jung's (1921/1971) Psychological Types focuses on the history and description of these attitudes (McCaulley, 1981). Inherited from Jung is the concept of a continuum between oppositional qualities (Smith, 1992). The first of these continuums is the attitudes of extraversion and introversion which are fundamental orientations toward life. Jung (1921/1971) defined extraversion as "an outward turning of the libido (psychic intensity)

...a positive movement of subjective interest towards the object...in a direct and observable fashion...when extraversion is habitual, we speak of the extroverted type" (p. 427).

Jung (1921/1971) defined introversion as "an inward-turning of libido in the sense...interest does not move towards the object but withdraws from it into the subject...when introversion is habitual, we speak of an introverted type" (p. 452). Every individual is assumed to inherently have both attitudes with one of the opposites being predisposed to develop the dominant attitude, while both remain present and in use by occasion and situation, the attitude chosen to be developed remains predominant throughout life. Edinger (1976), an analytical psychiatrist, describes extroverted and introverted types as:

> The extrovert is characterized by an innate tendency for his libido to flow outwards, connecting him with the external world. He naturally and spontaneously gives greatest interest and value to the object--people, things, external accomplishments, etc. The extrovert will be most comfortable and successful when functioning in the external world and human relationships...The introvert is characterized by a tendency for his libido to flow inwards connecting him with his subjective, inner world of thought, fantasies, and feelings. He gives greatest interest and value to the subject--the inner reactions and images. The introvert will function most satisfactorily on his own and when he is free from pressure to adapt to external circumstances (p. 2).

Summarized in simpler terms, extraversion describes the tendency to maximize interaction with the environment and introversion describes the tendency of the opposite behavior, to minimize interaction with the environment. Everyone extroverts and introverts daily (McCaulley, 1981).

The Four Functions. In addition, Jung (1921/1971) hypothesized there are four basic mental processes that are "sufficient to express and represent the various modes of

conscious orientation" (p. 518). Function was defined by Jung (1921/1971) as "a particular form of psychic activity that remains the same in principle under varying conditions" (p. 436). He deemed these functions to be independent dimensions because "...they cannot be related or reduced to one another" (p. 437).

The first two functions describe modes of perception: sensation and intuition, and the latter two functions describe modes of judgment: thinking and feeling. Sensation (or in Myers' terminology, sensing), functions as a conscious perception mediated by the five sense organs in direct opposition on a continuum to intuition which is perception by the way of the unconscious (or in Myers' terminology, insight). Thinking and feeling are opposing modes of reasoning, with the former using logical principles to form objective judgments and the latter feeling function using the acceptance or rejection of valuations to make subjective judgments. Jung believed every individual possesses and uses all four of these mental functions, which produces one's total world orientation. Jung described these four functions as:

> Sensation establishes what is actually present, thinking enables us recognize its meaning, feeling tells us its value, and intuition points to possibilities as to whence it came and whither it is going in a given situation. In this way we can orient ourselves with respect to the immediate world as completely as when we locate a place geographically by latitude and longitude. The four functions are somewhat like the four points of the compass; they are just as arbitrary and just as indispensable (1921/1971, p. 540).

However, Jung (1921/1971) also observed, "In reality, these basic functions are seldom or never uniformly differentiated and equally at our disposal. As a rule one or the other function occupies the foreground (the superior function), while the rest remain

undifferentiated in the background" (p. 518). In Jung's theory, the superior function is offset and balanced by the second- most developed of the undifferentiated functions or the auxiliary function.

These four functions, working in tandem and in combination with the attitude types, are the important framework to basic personality typology, as they define an individual's innate preferences, which ultimately shape one's approach to relationships and the world. Thus, Jung's typology would deem a personality classified into categories on the basis of the most developed function (sensation, intuition, thinking, feeling) as manifested through the most developed attitude: extraversion or introversion. Jung's theory placed the auxiliary function in the unconscious. Thus, there are eight psychological types derived from all possible combinations of the attitudes and functions in Jung's theory. However, in the development of the Myers-Briggs theory of type, the secondary auxiliary process is taken into consideration and subsequently adds to the formulation of this theory's sixteen types. In the next section, the expansion of Jung's theory is described.

Myers and Briggs' Personality Typology Theory

In 1942, Myers and Briggs developed an expanded version of Jung's theory of personality (Myers & McCaulley, 1985). Jung had wanted to improve the ability to self-describe within the confines of psychotherapy by devising a model of the basic components of personality. It was not his design to develop a theory. Isabel Briggs Myer's "goal was to help people to be happy and effective in whatever they chose to do" (Myers & Myers, 1980). She and her mother, Katharine Cook Briggs, together developed the MBTI.

Myers and Briggs' type theory expanded Jung's theory to include components Jung had described; however, he did not include it in his personality framework or definitions. In this paper, Myers and Briggs' type theory will refer only to the expanded version of Jung's theory and not his original conceptions of personality typology.

A New Continuum: Judging and Perceiving. "The importance of judgment and perception was implicit in Jung's work and was made explicit by Isabel Myers and Katherine Briggs in the development of the MBTI" (Myers & McCaulley, 1985). The judging and perceiving continuum has two uses: (1) it describes a new set of identifiable attitudes and (2) the continuum is used in conjunction with the extraversion - introversion continuum to identify which of the two preferred functions is the dominant function and which is the auxiliary function. If the judging attitude is preferred, a planned and orderly way of life is preferred. If the perceiving attitude is preferred, a flexible and spontaneous way of life is preferred. Further explanations required to be able to determine and understand the sixteen types goes beyond the scope of this study. For the purposes of this paper, a literature review for each instrument follows.

True Colors™ Personality Typology Theory

The True Colors™ concepts are based on the book Please Understand Me, coauthored by David Keirsey and Marilyn Bates (1978), which espoused the belief that individuals have deep-rooted characteristics which drive behavior as one strives to experience self-esteem or a sense of well-being. Individuals are imprinted with particular ways of thinking, understanding, valuing, and conceptualizing one's environment. Behavior, thus, reveals certain identifiable attitudes, preferences, wants, aims, needs,

motives, and desires that create and maintain an esteemed personal feeling. These attitudes drive behavior and habits, making behavior predictable.

In the development of the True Colors™ "many of the descriptive words used on the True Colors™ Word Cluster Instrument were extrapolated from works of David Keirsey, who has done extensive work in word association" (p. 13). Keirsey & Bates (1978) returned to the four temperament types of the ancient Greeks: Apollo, Dionysus, Prometheus, and Epimetheus. Keirsey & Bates (1978) in Please Understand Me discussed how these archetypes "represented the (four) temperaments quite accurately, albeit metaphorically" (p. 24). Lowry (1990) took Keirsey's & Bate's (1978) archetypal descriptions one step further as the basis of the True Colors™ Personality Types by assigning a color to metaphorically represent each temperament. Thus, the four archetypes were represented by the colors Blue, Orange, Green, and Gold, respectively.

Table 2.1

Historical Foundations for True Colors™ Personality Types

Hippocrates Humors Theory 460 - 377 BC	Galen's Humoral Theory of Temperament c130 - c200AD	Carl G. Jung's Theory 1921/1971	Eysenck's Trait Theory 1967	Lowry's True Colors™ (1979)
Phlegm	Phlegmatic	Feeling directed	stable introvert	Blue
Yellow	Choleric	Intellect directed	unstable extrovert	Green
Black	Melancholic	Body directed	unstable introvert	Gold
Blood	Sanguine	Intuition directed	stable extravert	Orange

Note. Excerpted from Aikens (1996) & Lowry (1988).

Part Two: Literature Review

This portion of Chapter Two is an integrative review of the current literature concerning the four instruments used for this study. The review is divided into the following sections: (1) the True Colors™ Character Cards' Activity and Word Cluster Instrument, (2) the Myers-Briggs Type Indicator (MBTI), (3) the Strong Interest Inventory (SII), and (4) the Campbell Interest and Skill Survey (CISS). The CISS is the newest of these instruments to be released. The True Colors™ instrument was first used in 1979 but has little academically related research to report. In contrast, the SII and the MBTI have a long history of use, revisions, research, reviews, and manuals. Complete reviews of these later two instruments is beyond the scope of this study and related literature. Therefore, the literature reviews of the MBTI and the SII will be confined to citations relevant to the confines of this convergent validity study.

True Colors™ Character Cards' Activity and Word Cluster Instrument

Academic research involving True Colors™ is sparse. A search of the Dissertations Abstract Index for the years 1979 through 2000 using the subject index terms "True Colors" and "personality type" yielded two dissertations. Dahlem (1993) reported on the impact of the True Colors™ personality types on teaching strategies based on personality type for 72 at-risk and 70 regular ninth-grade students in a California high school. In this study, those students instructed with methodologies commiserate with the students' personality temperament were found to improve academically and increase their overall efforts to learn. This type of instruction based on similar personality temperament also had a greater effect on at-risk students in comparison with regular students in the same study. Holland (1991) reported on the impact of True Colors™ personality types on self-concept based on personality type for 40 at-risk and 77 regular eighth-grade students in a Tennessee middle school. In this study, the use of True Colors™ had no statistically significant effect on the students' self-concept based on pre- and posttest administrations of the Piers-Harris Children's Self-Concept Scale over a four month time period.

The third study found was not published in the Dissertation Abstracts but was located through F. Leafgren, the True Colors™ National Training Director (personal communication, January 10, 1998). Tate (1998) focused on the True Colors™ personality types and the leadership styles of K-12 school administrators. In this study of forty-one elementary, ten middle school, and 15 secondary principals within the DeKalb County School System of Decataur, Georgia, Tate (1998) found a significant relationship between Personality type and leadership style. Gold was the preferred personality and leadership

style of the K-12 administrators.

An important point to note with each of these three studies is the assumption the True Colors™ Character Cards' Activity and Word Cluster Instrument are reliable and valid methods of determining personality type without any empirical evidence to support this assumption. The Buros Institute of Mental Measurement and Tests in Print series from 1979 to 2000 contain no mention of the True Colors™ Character Cards' Activity or the Word Cluster Instrument in any of its volumes or supplements.

Although Kalil (1998) presented a thorough explanation of the True Colors™ personality types and Character Cards' Activity in her book, Follow Your True Colors™ to the Work You Love, no mention or use of the True Colors™ Word Cluster Instrument or any reference to the theoretical foundation to the personality types was made.

Lowry (1990) in a Communications Companies International report now available through True Colors™ Communications Group, Recognizing the Esteem of the Nation, stated that True Colors™ has "research from studies with over 39,000 Americans of all ages, gender, and ethnicity" (p. 1). Note, these studies involve using the Character Cards, a ranking activity with four cards representing the four personality temperament for self-assignment, rather than the True Colors™ Word Cluster Instrument.

The first study cited in the report was a 1988 national study on alcohol and drug abuse conducted in cooperation with The Media-Advertising Partnership For A Drug-Free America. As part of this campaign beginning in 1987, the Partnership conducted a survey sampling of over 8,000 respondents in 89 shopping malls and 130 campuses with a questionnaire concerning drug-use practices, as well as determined the respondents True

Colors™ personality temperament. The samples were selected and weighted to approximate the general population. Table 2.2 shows the demographics of the study by age and by the respondents self-reported True Colors™ personality temperament. Within the study's focus age group of 1,900 teenagers ages 13 to 17, 66 percent of the respondents who declared a casual to severe drug-use also chose the True Colors™ Orange personality temperament as first of the four possible personality temperament choices. The percentage increased to 84 percent by adding the teenagers who chose Orange as their second-placed personality temperament of the four types. This study does not state what the reported drug use percentages are of the respondents with Gold, Green, and Blue types. The study indicates an overall decrease according to age from childhood to adult in individual personality types of Orange (-14%) and Green (-2%). The remaining personality types showed an overall increase for Gold (+22%) and Blue (+4%). These percentages in the respective age groups seem to indicate that personality types can and do change overtime and may be due to one's developmental age.

Table 2.2

Percentage of True Colors™ Personality Temperament Groups By Age: 1988 and 1989 (N = 14,000)

Age	9-12	13-17	18-23	24+
n =	2,300	1,900	9300	
	Children	Teens	College Students	Adults
Orange	36%	35%	16%	12%
Green	15%	11%	17%	13%
Gold	31%	28%	38%	53%
Blue	19%	25%	30%	23%

Note. National sample data from Lowry, 1990.

A second national study reported by Lowry (1990) informally surveyed another 6,000 preteens and teens. This study's results also found that of the respondents with Orange personality temperaments, 91 percent are most likely to abuse drugs. Moreover, the Orange personality temperament reported a 90 percent school dropout rate. Drug abuse in the other personality types of Green, Gold, and Blue were well below 10 percent and school dropout rates for these types were not provided. However, caution is warranted in using these results, since the actual sampling procedures are not reported and are also declared to be the results of "informal" procedures.

It is interesting to note the Orange personality temperament characterizes individuals as those who experience esteem by acting in the moment, doing things requiring variation and flexibility, enjoy applying skills through the use of tools and self-describe as adventurous. In Table 2.2, the children and teen groups comprised 71 percent of the Oranges and 26 percent of the Golds, while Orange adults comprised only

28 percent, yet Gold adults accounted for 91 percent. This population breakdown is interesting to compare with Tate's (1998) study which found that the preferred personality and leadership styles of K-12 principals to be Gold or a personality temperament of individuals who experience esteem by being responsible, valuing loyalty, dependability, conformity, punctuality, and order. This adds an interesting implication to a description of any given school according to personality temperament -- the more traditional Golds are administrating and teaching a classroom in which almost three-quarters of the students are adventuresome or Orange, needing variation and applied learning techniques. Given the percentage of True Colors personality by age groups shown in Table 2.2, it is apparent that True Colors™ personality type changed over time. In children, ages 9 to 12, 36 percent are Orange. This percentage dropped to 16 percent in 18 to 20 year olds and 12 percent in adults. Conversely Golds, which were 31 percent of the 9 to 12 year olds, increased to 38 percent of the 18 to 20 year olds and comprised 53 percent of the adult population. If this is a true representation of the general population's personality type distribution, it could indicate that developmental age can have a marked affect on personality type.

In the third study reported by Lowry (1990) the True Colors™ Character Cards' Activity was used in a ten-year, statewide initiative to develop a school climate program which would promote positive attitudes in Tennessee schools. The program, Positive Attitudes in Tennessee Schools (PATS), was the 1991 winner of The National Dropout Prevention network award in which over 500 educators have been trained to deliver the True Colors™ program to 20 elementary, 6 middle, and 11 high schools. Tennessee's

comprehensive program is one of over 200 school districts, community colleges, and universities that has incorporated the True Colors perspective (Lowry, 1990). Although Lowry (1990) stated the PATS program was found to have had significant changes in the schools' climates, positive attitudes, students' self-esteem, improved community relations, and improved collaborative problem-solving, no specific statistics relating to True Colors™ possible effect or contribution to these outcomes were given. The next section will concern an integrative literature review concerning the second instrument involved in this research.

Myers-Briggs Type Indicator

The Myers-Briggs Type Indicator (MBTI; Myers & McCaulley, 1985) is self-report inventory with Form G first published in 1977, to explicitly make it possible to test C. G. Jung's (1921/1971) theory of personality. Isabel Briggs Myers and her mother, Katharine Cook Briggs' aim was to develop a personnel selection test because they believed that different personality types were attracted to different vocations and Jungian theory was a bridge between personality and job performance (Pittenger, 1993).

Although much has been written on the MBTI, Bayne's review (1995) stated most of the 1000-plus publications regarding the MBTI are found in MBTI-related journals with the majority related to applications, rather than empirical research. Carlson's review (1985) concluded with an emphasis on the need for "a greater variety of validity research with less restrictive populations, that is, outside of the university and by investigators with little vested interest in the instrument" (p. 364).

The few studies published in major journals, those of Carlson & Levy (1973) and

Hicks (1984), were of high quality (Bayne, 1995). Aiken (1996) stated that the use of dichotomous dimensions or categorical data only in the MBTI, when psychometricians have held the results from continuous scales in higher esteem, could be one explanation for the continued omission from mainstream psychology and personality journals. Guilford's (1959) earlier view that "classifying ... persons into type categories is a most natural approach for the beginner in personality studies" (p. 89), would seem to add historical support to Aiken's (1996) explanation. Thus, it is not surprising that the primary source of data for the MBTI has been the test's manual, although it is considered by some to be among the top two or three manuals in current use (Thompson & Ackerman, 1994; Willis & Ham, 1988). For that reason unless designated otherwise, citations regarding the MBTI in this section will be assumed to be from the MBTI Manual (Myers & McCaulley, 1985).

Reliability. The assessment of reliability data uses findings mostly based on post-elementary and college populations and comparison of these findings is complicated by the two data types (preference and continuous) obtained by the MBTI, the various statistical procedures employed, and the existence of three forms, F, G, and AV in current use (Willis, 1984). Using the continuous score data Devito (1985) stated the test-retest reliability is good, ranging from .48 (14 months) to .87 (7 weeks) in studies by Carskadon, 1977; Carlyn, 1977; Levy, Murphy & Carlson, 1972; Stricker & Ross, 1964. The test-retest reliability of males on Thinking - Feeling dimension seems to be the least stable (Willis, 1984).

Validity. The primary research data source has been the test manual (Myers & McCaulley, 1985), which strongly supports the test's validity. As evidence, Myers and

McCaulley (1985) have produced approximately 146 pages of correlations with other instruments and charts of type tables of the percentages of each type in any given sample. According to the manual's authors, "the type table for a given occupation has significantly more of the types predicted by theory to have interest in, and therefore be more likely to be members of, that occupation, then the type table contributes to construct validity" (p. 176).

Convergent Validity. Two strategies have been employed to explore the MBTI's convergent validity: (1) correlational studies using scores that have been converted into continuous scores, in order to correlate the MBTI dimensions with other instruments' scales and (2) distribution studies using categorical MBTI scores in order to classify samples according to whole types in the 16 types inherent in the MBTI. Since this study is not focusing on the 16 whole types (ESFP, INTJ, ENTJ, etc.), the second strategy of whole type classification and distribution will not reviewed.

Correlational studies consisted of transforming the four MBTI preferences or the numerical scores into continuous scores and then computing Pearsons Product Moment correlation coefficients between the MBTI scales and scales of other instruments. It is important to note that in these studies, due to the dichotomous form of the MBTI dimensions, a positive correlation indicated a positive association with Introversion, Intuition, Feeling, and Perceiving. Conversely, negative correlations indicated a positive association with Extraversion, Sensing, Thinking, and Judging. Table 2.3 illustrates these associations.

Table 2.3

Association of MBTI Dichotomous Dimensions Converted Continuous Scales With Other Instruments

+ Correlation Coefficients:	Introversion	Intuition	Feeling	Perceiving
- Correlation Coefficients:	Extraversion	Sensing	Thinking	Judging

Note. Excerpted from the MBTI Manual, 1998.

The MBTI Manual (pp. 177 - 206) presents tables on the correlations between the four MBTI dimensions and the scales of a broad range of 10 inventories and 18 other personality instruments. Note, as the 1994 MBTI Manual (Briggs-Myers, et al., 1994) points out, a correlation of at least .20 indicates that at least 4 percent of the variance is shared among the two variables being correlated and validity coefficients in the behavioral sciences are typically lower than reliability coefficients. Cohen (1988) states that these types of correlations between personality and social psychology variables are considered large if they are approximately r = .5 or 25 percent of the shared variance. Correlations of .20 are considered small-to medium-sized effects, which are quite common and meaningful. For purposes of Jung's theory, it is equally important that certain correlations are not significant. For example, Extraversion should be positively correlated with measures of sociability and not positively correlated with Thinking. Note, Myers & Myers (1985) in the Myers-Briggs Manual stated that "intercorrelations of continuous scores for various populations show that E/I, S/N, T/F, and J/P tend to be independent of each other" (p. 150).

The Extraversion/Introversion dimension has been studied more than any other personality characteristic with substantial differences in the definitions and measures

(Bayne, 1995). In most studies, the E/I dimension is a contrast between sociability versus detachment (Thorne & Gough, 1991). The E/I preferences appear to be most related to the choice of work settings (Myers & McCaulley, 1985, p. 77).

The MBTI Manual (1985) reported significant correlations ranging from -.77 to -.40 with other instruments measuring Extraversion: the Minnesota Multiphasic Personality Inventory (Dalhstrom & Welsh, 1972) and the Sixteen Personality Factor Questionnaire (Cattell, Eber & Tatsuoka, 1970). Extraversion on the MBTI was moderately related to scales suggesting orientations toward self-acceptance, sociability, dominance, and venturesomeness. Thorne & Gough (1991) demonstrated that extroverts are rated by others as outgoing, sociable, and talkative, while introverts are described as quiet and reserved.

In these studies, the highest correlations with the Jungian Type Survey were found on the Introversion scale (.79), Intuition scale (.58), and the Feeling scale (.60) in the results of a sample of 47 males (Wheelwright, Wheelwright & Buchler, 1964). This relatively high correlation would also provide evidence in support of the construct validity of the E/I scale. Other moderately related scores were with scales reflecting orientations of self-discomfort, social discomfort, autonomy, and creativity.

The Extraversion - Introversion dimension's lowest correlations, which ranged from .35 to -.47, were found with the Strong-Campbell Interest Inventory (SCII; Campbell & Hansen, 1981). Kummerow (1991) also found a low correlation of .40 with the Strong Interest Inventory's narrower definition: wanting to work most with people (E) or with data and ideas (I). The low correlations suggest the E/I dimension is measuring an

individual's orientation to life or social situations, rather than to work. Extraversion is moderately correlated with the General Occupational Themes (GOTs) of Social and Enterprising (Hammer & Kummerow, 1996; Apostal & Marks, 1990).

The Sensing - Intuition preferences appear to be most related to typical choices of occupations (Myers & McCaulley, 1985, p. 77). The Sensing scale significantly correlated in the range of -.67 to -.40 included the following: a practical outlook, learning for practical use, economic interests, and proper, rule-bound attitude. Sensing in the terms of managing reality is found in correlations with leadership, achievement, order, and self-control. Sensing was moderately related to scales orientated to concrete thinking, conscientiousness, and control. Thorne & Gough (1991) describe this scale as "favors conservative values in a variety of areas: uncomfortable with uncertainty and complexities" (p. 53). Hammer & Kummerow (1996) found Sensing to be moderately correlated with the General Occupational Theme (GOT) of Conventional in the Strong Interest Inventory.

The Intuition scale is moderately correlated with the General Occupational Theme of Artistic (Hammer & Kummerow, 1996). Scales significantly correlated in the range of .62 to. 40 included the following: experimental/flexible, complexity, academic interests, autonomy, artistic, creative personality, artistic sensitivity, theoretical, self-actualizing, and a capacity for status. Thorne & Gough (1991) describe this scale "as thinking and associating to ideas in unusual ways; unpredictable and changeable in behavior and attitudes and tends to be rebellious and nonconforming; imaginative, ingenious, and original" (pp. 51-51).

Scales or personality characteristics that correlated with Thinking range from -.57 to -.40 were: counteraction, masculine orientation, abstract conceptualization, dominance, assertiveness, autonomy, achievement, and aggression. This scale was also moderately correlated with other scales measuring: theoretical thinking, tough-mindedness, and distrust. The Thinking scale is also moderately correlated with the General Occupational Theme of Realistic of the Strong Interest Inventory (Hammer & Kummerow, 1996).

Scales significantly associated with Feeling range from .55 to .40 were: measures of concern for others, including nurturance, succorance, and social service; scales concerned with interest in people including affiliation and sociability; scales indicating the adaptability of feeling to others' demands including deference and abasement; blame avoidance. Feeling is moderately correlated with the General Occupational Themes of Artistic and Social of the Strong Interest Inventory (Hammer & Kummerow, 1996).

The Judging - Perceiving dimension is the least studied of the four dimensions (Bayne, 1995). Scales significantly correlated with a range of -.59 to -.40 with Judging were: order, proper, rule-bound attitude, stronger superego, endurance, self-control, achievement, and counteraction. Judging was also moderately related to scales that orientate to practicality, orderliness, conscientiousness, concrete thinking, control, and deference. Judging is moderately correlated to the General Occupational Theme of Conventional of the Strong Interest Inventory (Hammer & Kummerow, 1996).

Scales significantly associated with a range of .57 to .40 were: complexity, reality-distance, aesthetic, change as challenge, intellectual quality, and imaginative. Scales

moderately correlated to Perceiving were: flexibility, autonomy, and creativity. Perceiving is moderately correlated to the General Occupational Theme of Artistic of the Strong Interest Inventory (Hammer & Kummerow, 1996).

With regard to the theoretical foundation of Jungian theory using the Jungian Type Survey, the evidence demonstrated that the four MBTI dimensions capture the E/I (.79), S/I (.58), and the T/F (.60) portions of Jung's theory. Note the J/P dimension's exclusion from the Jungian Type Survey.

Carlson's (1985) review concluded with the recommendation that "research on the MBTI needed to develop the conceptual steps that would allow for clear empirical assessment of related constructs" (p. 359). This review would support Carlson's view in that many of the scales used within the correlations presented for Form G of the MBTI overlap into several of the scales making the delineation of each scale often unclear. The next section of the integrative literature review will concern the third instrument in this research, the Strong Interest Inventory.

Strong Interest Inventory

The Strong Interest Inventory (SII) has the longest history of any currently used psychological test (Donnay, 1997) and is the most widely used interest inventory (Bubenzer & Zimpfer, 1990; Campbell, 1968; Donnay, 1997; Hansen & Campbell, 1985; Walsh & Betz, 1995; Watkins, 1993; Zytowski & Warman, 1982). Introduced in 1927 by Edward K. Strong, Jr., it continues to be extensively researched and highly respected (Westbrook, 1985). Covering the years from 1941-1978, a review of the 2nd - 8th Mental Measurements Yearbook found the number of publications regarding the SII totaled an

impressive 1,521 entries (Westbrook, 1985). One of the reasons for this high level of research and application for the instrument was E. K. Strong's firm belief in the value of applied research and his insistence on an active research program for the instrument, resulting in the SII being "more than satisf(ying) the standards for tests and testing that have been set by the profession" (Busch, 1995).

Reliability. Four samples to evaluate the test-retest reliability included a three to six month retest on a national sample of working adults and three samples of college students at different universities, with retest intervals of one to three months (Manual, p. 83). The three to six month reliabilities for the working adult sample were .82 to .94, with a median of .86. The one month reliability for the College 1 sample ranged from .78 to .93, with a median of .85. The three month reliability for the College 2 sample were .66 to .91, with a median of .80. The three month reliability for the College 3 sample were .72 to .90, with a median of .83. It is important to note that the College 2 and 3 samples were given intervening career exploration experiences.

Correlations with previous instrument versions ranged from the .50s for 16-year olds retested 36 years later, to the .90s for samples tested and retested over a few weeks (Manual, p. 84). No median internal consistency estimate is given in the manual, although the 25 scales' scores, as measured by Cronbach's Alpha, range from .737 for Agriculture to .938 for Mechanical Activities or a median of .866 for the 1994 version. Reviews of the 1994 version of this instrument in recent Mental Measurements Yearbook or Tests in Print were not available.

Validity. "There is no single index of validity for the BISs; instead a variety of information has been drawn together to show that scores on these scales are reasonable and are related to the respondent's behavior" (Manual, p. 85). The following paragraphs summarize the Manual's data. Content validity of each scale is focused on one content area. For example, the Science scale has items such as Astronomer, Biologist, Chemist and Working in a research laboratory. Responses to these particular items would provide information about the respondent's feelings relating to scientific occupations and activities. Actual data was not provided for content validity.

Convergent validity for the BISs can be evaluated by comparing the high scores of those currently working in different occupations with the scales relevant to their current occupations. For example, teachers should score high on the Teaching Scale and also should score low on scales not related to their occupation. The Manual gives the 15 highest and 15 lowest occupations for the 25 BISs and states that the "mean occupational scores often spread out over 2 to 2.5 standard deviations, or a range of 20 to 25 points...(with) the results sugges(ing) substantial validity for the BISs" (p. 91). Although specific scores are not given in the figures (p. 92-104) for the 25 scales, the approximate range of scores for the highest occupations were .55 to .71 and .40 to .48 for the lowest occupations. Therefore, a review of this data would seem to support the 1994 Strong's convergent validity.

Predictive validity is "the power of an inventory to discriminate statistically between two groups who will behave somewhat differently sometime in the future" (Manual, p. 91). The Manual also states that the predictive validity of the BISs is not as

good as their convergent validity because discrimination for a long-range is more difficult than a convergent one. In the Manual, Harmon, et al (1994), cite predictive validity studies of previous versions of the Strong (Hansen & Campbell, 1985; Campbell, 1971) and state because of the similarity of the BIS scales among versions those previous studies "can be generalized to the 1994 Strong" (p. 91). Although revisions have historically increased the Strong's convergent and predictive validity (Worthington & Dolliver, 1977; Creaser & Jacobs, 1987), Saladin (1995) cautions that the "many changes to the instrument mitigate against the blanket application of the previous validity data to the new inventory" (p. 2). No other studies on the instrument's predictive validity were available.

Although results of previous studies of the validity of the SII have some variation, the concurrent validity of the SII has been consistently demonstrated (Betz & Taylor, 1982; Campbell, 1971; Hansen & Campbell, 1985; Hansen & Swanson, 1983; Hansen & Tan, 1992; Spokane, 1979; Worthington & Dolliver, 1977).

Since its inception in 1927, the instrument, then called the Strong Vocational Interest Blank, has undergone a total of ten major revisions to get to its current 1994 version. The previous revisions improved empirical foundations, broadened occupational ranges, and combined the occupational scales for both genders with the previous revision taking place in 1985 (Worthen, 1995).

The most recent revision, released in 1994, consisted of research conducted with 55,000 people in 50 occupations who completed a research version of the SII during 1992 and 1993. From this sample, a criterion group meeting the selection criteria was made up of approximately 40,000 occupational group members. The final criterion for each

occupation was set to 200. This resulted in a random selection for the General Reference Sample of 9,467 women and 9,484 men (Harmon, et al., 1994). The responses of the General Reference Sample ultimately resulted in the following changes for the 1994 revision: (1) updated items, through dropping or rewriting, for the Item Booklet/Answer Sheet, (2) developed new Occupational Scales (OSs) representing recently emerging occupations, and (3) renormed some of the scales by adding new data from contemporary occupational groups to be used for existing OSs formerly based on old criterion groups (Harmon, et al., 1994).

For the General Occupational Themes (GOTs), the 1994 revised scales have a high internal consistency with Cronbach's alpha measurements of .90 or more for all six scales: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). Test-retest reliabilities in four different samples also improved to .95 for females and .96 for males on parallel scales between the 1985 version with the 1994 version, demonstrating stability over time (Harmon, et al., 1994). The Basic Interest Scales remained very similar over the revision with the median correlation between the old and new scales at .987 (Harmon, et al., 1994). The female and male General Reference Sample of the 1994 version were also scored on all of the Occupational Scales that appear on the 1985 and 1994 Strong with the scores on matching scales resulted in a mean correlation of .83 for females and .82 for males (Harmon, et al., 1994). As Fouad (1999), concludes regarding the validity of instruments over time with regards to numerous revisions "All major interest inventories report relatively high correlations between revisions of the instrument...this evidence indicates that inferences made about inventory results given in

previous revisions of the instrument are generalizable to the current inventory" (p. 201).

Although the Manual reports data supporting the validity of the new 1994 version of the SII, outside research is still limited, especially concerning concurrent validity studies. According to Hammer & Kummerow (1996), the limited result of a literature review "is not surprising, given that the SII revision is relatively recent and that the lag time for publication is professional journals is quite long" (p. 36). A search of Dissertation Abstracts International, from 1994 through 1999, revealed only four studies concerning the concurrent validity of the SII.

Holme's (1996) study of the concurrent validity of the Strong Interest Inventory for 121 African American undergraduates was based on the undergraduates' highest preference among the six General Occupational Themes matching their choice of major or expressed occupational choice. The study did not find significant results regarding the concurrent validity for the six General Occupational Theme scales. The hit rates or matches for the African American undergraduates were 42 percent for men and 49 percent for women in the study indicating that the SII's General Occupational Themes did not demonstrate a high concurrent validity between this samples of African Americans' choice of occupation, college major and General Occupational Theme.

Ohlson's (1996) study using 17,165 of the General Reference Sample for the 1994 revision of the SII found none of the expected differences in the concurrent validity of the General Occupational Themes and the Basic Interest Scales when accounting for gender, indicating that the SII "is psychometrically equivalent for women and men in its capacity for relating interest patterns to occupational group membership" (p. 67-68).

Donnay (1995) investigated the 1994 SII using a multivariate technique of discriminant function analysis with 18,951 employed men and women of the General Reference Sample's 50 occupations. Using combined-sex samples to examine the SII's capacity for predicting occupational group membership, this study found direct hit rates of 10.41 percent for the General Occupational Themes and 21.76 percent for the Basic Interest Scales with these rates reflecting a 5 and 10 times better than chance rate, respectively for the SII's ability to predict group membership in differing occupations.

Saladin (1995) found support for the construct validity of the SII, as well as the RIASEC organization of the General Occupational Themes, and support for the concurrent validity of the Occupational Scales (OSs) on the SII when correlated with the similar Orientation Scales of the Campbell Interest and Skill Survey.

Hammer & Kummerow (1996), co-authors of the Strong and MBTI Career Development Guide, devote a chapter to the description of 11 new samples of 349 adults and 468 students who took both the 1994 Strong Interest Inventory (SII) and the Myers-Briggs Type Indicator (MBTI). The co-authors intent was to show the relationship of the MBTI whole types (i.e., ISTJ, ESFP, ENFJ) as correlated with the SII's General Occupational Themes (GOTs); however one table included the continuous scores of the four MBTI dimensions correlated with the General Occupational Themes, provided in Table 2.4. The GOT of Realistic had a correlation of -.20 with the MBTI dimension of Thinking for students (-.16 for adults) and a .25 correlation with the MBTI dimension of Perceiving for students (.05 for adults). The Investigative GOT showed moderate correlation in the adult sample only with a -.18 with the MBTI Thinking dimension and

.17 correlation with the Intuition dimension of the MBTI. The highest correlation occurred between the GOT Artistic with the MBTI dimension of Intuition with a .48 and .43 correlation for adults and students, respectively. Artistic also correlated with the MBTI dimension of Feeling with a .24 and .31 for adults and students, respectively. The Social GOT correlated highly with the MBTI Feeling dimension, .33 and .36 for adults and students, respectively. The Enterprising GOT correlation of -.29 for adults was higher than for students (-.17) in relation to the MBTI dimension of Extraversion. Finally, the Conventional GOT correlated with the MBTI dimensions of Sensing with a -.37 and -.25 for adults and students, respectively for Sensing and a -.26 and -.25 with Judging. Table 2.4 displays only these highlighted correlations and eliminates those which are not significant for optimal clarity.

Table 2.4

Relationship Between Significant Strong General Occupational Themes and MBTI Continuous Scores

Strong GOTs	Sample	E	S	N	T	F	J	P
Realistic	Adults				-.16			
	Students				-.20			.25
Investigative	Adults		.17		-.18			
	Students							
Artistic	Adults			.48		.24		
	Students			.43		.31		
Social	Adults					.33		
	Students					.36		
Enterprising	Adults	-.29						
	Students	-.17						
Conventional	Adults		-.37				-.26	
	Students		-.25				-.25	

Note. Adults N = 349; students N = 468

Harmon & Kummerow (1996) concluded their presentation of the 11 samples as verification that "the pattern of (these) relationships show that scores from the two instruments (the MBTI and the SII's General Occupational Theme scales) are related in ways that are congruent with the theories that underlie each" (p. 40). The general notion that some interest inventory measurements can overlap with personality has been long-held and well-substantiated by vocational and psychological researchers (Ackerman & Heggestad, 1997; Costa, McCrae, & Holland, 1984; Cottle, 1950; De Fruyt & Mervielde, 1997; Gottfredson, Jones, & Holland, 1993; Tokar & Swanson, 1995).

Campbell Interest and Skill Survey

The Campbell Interest and Skill Survey was introduced in 1992 by David P. Campbell, who than had thirty-five years of distinguished experience in the measurement

of vocational interests with his work with E. K. Strong. From 1974 to 1988, the Strong-Campbell Interest Inventory existed as one of the major revisions and subsequent widely used earlier forms of the now Strong Interest Inventory.

The Campbell Interest and Skill Survey (CISS), is comprised of 320 items. Two hundred interest items are rated by respondents on a six-point scale ranging from "Strongly Like" to Strongly Dislike" which reflects an attraction and repulsion for different occupational areas (Manual, 1992, p. 1). For the 120 skill items, respondents rated their level of skill from "Expert: Widely recognized as excellent in this area" to "None: Have no skills in this area" on a six-point scale which reflects an estimate of self-confidence in performing in various occupational areas (Manual, 1992, p.1). The inventory represents a newer trend toward including self-report estimates of self-efficacy or confidence in one's skills (Donnay, 1997) based on evidence demonstrating self-efficacy to be a predictor of vocational behavior and career choice (Betz & Hackett, 1981; Hackett & Lent, 1992; Lent, Brown, & Hackett, 1994).

Not unlike the SII, the results are organized into three main categories; orientations, basic scales and occupational scales. The self-reported interest and skill scores are organized as follows: Orientation Scales (7 scales), Basic Scales (29), Occupational Scales (58 scales), Special Scales (2 scales), and Procedural Checks (3 checks). However, with the CISS, results are given in the form of interest items paralleled with skill items in every area assessed. Pugh's (1998) review agrees with the CISS Manual authors, Campbell, Hyne, & Nielson (1992), that this parallel presentation is warranted as a means to demonstrate the similarities between the CISS Orientation Scales with the

Holland RIASEC Themes.

Pugh's (1998) review in the Thirteenth Mental Measurements Yearbook states the CISS "has a very extensive and comprehensive manual and has been developed following and often exceeding the Standards for Educational and Psychological Testing" (p. 169). Roszkowski's (1998) review agreed with Pugh (1998) that the CISS was a "valuable addition to the category of empirically key interest inventories," but noted that "reliability and validity data on the CISS are not as extensive as that on the Strong-Campbell Interest Inventory, but then it has not been around for as long" (p. 172).

Reliability. The median internal consistency estimate is .87 and the median test-retest correlation (over 90 days) was .87 for interest scores and .81 for skill scores for the Orientation Scales (Pugh, 1998).

Validity. Evidence for the validity of the Orientation Scale included intercorrelations between interest and skill scores which were lower among orientation scales and higher between interest and skill scores, "indicating that the Orientations are indeed measuring different dimensions ...exceptions are the Influencing and Organizing and Producing and Adventuring Orientations ...correlated at about the .50 level, indicating a fair amount of overlap in the topics measured by each pair" (Manual, 1992). The remaining Orientations -- Creating, Helping, and Analyzing -- are more clearly differentiated. Pugh, (1998) stated in his review in the Thirteenth Mental Measurements Yearbook, "In summary, the CISS has a very extensive and comprehensive manual and has been developed following and often exceeding the Standards for Educational and Psychological Testing" (p. 169).

Saladin (1995) found the CISS to have higher hit rates for the selection of a college major than the 1994 SII version. The concurrent validity of the CISS (.88) in the selection of a college major by 163 freshman and sophomores was higher in comparison with the 1994 SII version (.73) for the same subjects. Results also indicated that the CISS has higher hit rates for college major selection than the previous version of the SII (Hansen & Swanson, 1983; Hansen & Tan, 1992).

The primary source of data for the CISS has been the test's manual which was deemed to be very extensive, comprehensive, and often exceeding standards (Pugh, 1998). For that reason, unless designated otherwise, citations regarding the CISS for the remainder of this section will be assumed to be from the CISS Manual (Campbell, Hyne, & Nilsen, 1992). The CISS Manual (Campbell, et al., 1992) provides data that support the concurrent validity of all of the instrument's scales. However, unlike the MBTI (1998) and SII (1994) Manuals, no independent research was provided.

The internal consistency of the Orientation Scales interest portion ranged from .82 for Creating to .93 for Analyzing, with a median internal consistency reliability of .87. The Creating Scale has the weakest internal consistency reliability of the seven Orientation Scales. The remaining scales internal consistency reliability are: Influencing (.89), Organizing (.88), Helping (.86), Producing (.87), and Adventuring (.86). The median test-retest reliability was .87 with a range of .81 to .88 from a sample of 324 individuals in 54 occupations who took the CISS twice at a three month interval.

The validity analysis in the Manual (1992) involves (a) the intercorrelations among the various scales and (b) the pattern of mean scores for the different occupations

represented. Although a factor analysis was conducted in support of the development of the Orientation Scales, this information was not presented, but would have a bearing on the instrument's validity (Roszkowski, 1998). The Orientation Scales' intercorrelations of the interest items with the skill items are "mostly low, indicating that the Orientation Scales are indeed measuring different dimensions" (p. 70). Exceptions to this are the paired scales of Influencing with Organizing and Producing with Adventuring, in which both pairs correlated at approximately at the .50 level, indicating a fair amount of overlap of the topics covered by each pair. Helping, Creating, and Analyzing are more clearly separate from the other scales. The median correlation between the interest and skill items is .70, indicating a substantial correlation.

In summarizing the presentation of scale correlations between the MBTI, the SII, and the CISS, studies have shown moderate correlations between Feeling (MBTI) and Social (SII), Thinking (MBTI) and Realistic (SII), Judging (MBTI) and Conventional (SII), and Perceiving (MBTI) and Artistic (SII). These correlations were used to determine which dimensions of the MBTI and SII are to be compared in this study. Correlations between the SII and the CISS were based on available research. The decision on which dimensions of the CISS to be used in this study are based on similar descriptions of the CISS with the SII dimensions. Table 2.5 shows the paths of associations between the instruments based on the available research to-date.

Table 2.5

Dimension Associations for the True Colors™ Character Cards' Activity and Word Cluster Instrument's Four Personality Types, Myers-Briggs Type Indicator's Dichotomous Scales, Strong Interest Inventory's Six General Occupational Themes, and Campbell Interest and Skill Survey's Seven Orientation Scales

True Colors Personality Types	MBTI Dichotomous Functions	SII General Occupational Themes	CISS Orientation Scales
Blue Focus on harmonious relationships; compassionate; authentic; warm; communicative.	> **Feeling** Value < based decision-making with a consideration for the consequences on others.	> **Social** Prefer working < with individuals and groups; helping, caring, and nurturing others; teaching; solves problems through feelings and interaction with others.	**Helping** Aiding others through teaching, healing, and counseling; value compassion, interpersonal harmony; nurturing and enjoy solving human problems; giving service to others.
Green Curious; seeking; inventive; theoretical; complex; philosophical; principled; rational.	**Thinking** Logical- < based decision-making with inquiry; consideration for fairness; cause and effect.	**Investigative** Prefer academic/scientific ideas, data, things, working alone; gathering/ analyzing new data and theories; value curiosity.	**Analyzing** Analyzing data using mathematics and carrying out scientific experiments.
Gold Organized; conventional; orderly; procedural; practical; responsible; tradition; loyal.	**Judging** Prefer to < plan ahead to avoid stresses/changes at the last minute; Organized.	> **Conventional** Prefer organizing, detail, accuracy math, data, management, work well in corporations; value stability.	> **Organizing** Organizing the work of others; managing and monitoring financial performance.
Orange Active; realistic; daring; spontaneous; opportunistic.	**Perceiving** A < high value for spontaneity; open and adaptable to change.	> **Realistic** Prefer outdoors and working with tools; prefer action concrete problems; higher risk-taking; value Tradition, common sense.	**Producing** Like to < produce products using hands-on skills in farming, gardening, construction and mechanical crafts.
	Sensing Focusing mainly on what can be perceived by the five senses; attending to facts that are observable.	> **Enterprising** Prefer persuading, managing, and selling; motivating and directing; value risk-taking, competition.	> **Influencing** Like to make things happen; negotiate and debate; take charge; direct others; set policies and Motivate.
	Intuition Focus on < perceiving patterns and interrelationships; attend to meanings and possibilities.	>**Artistic** Focus on >self-expression, aesthetics, >and art; creative; value originality, independence, imagination and beauty.	> **Creative** Inventive, clever and imaginative; value self-expression and independence; designing, creative activities.
	Extraversion Directing < energy mainly toward the outer world of < people and objects.		**Adventuring** Focus on < activities involving risk-taking, teamwork; value physical challenges and competitive outlets.
	Introversion Directing < energy mainly toward the inner world of experiences and ideas.		

Note. Excerpted from Keys to Personal Success, Lowry (1988), MBTI Manual (1998), SII Manual (1994), & CISS Manual (1992).

CHAPTER THREE

Methods And Procedures

This section describes the research approach and design, the participants and sampling procedures, the location and setting, the instrumentation used, reliability and validity of each instrument, the data collection procedures, and a preliminary estimate of the data analysis. The purpose of this study is to explore the relationship of the True Colors™ four personality domains with specific dimensions from the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey, in order to explore the convergent validity of the True Colors™ Character Cards' Activity and Word Cluster Instrument.

Research Approach and Design

This study is a basic associational design approach. The independent variables are the True Colors™ personality types of Blue, Green, Gold, and Orange. The design is within subjects/repeated measures and the analysis conducted was a correlation of the scores from each instrument. The independent variables are attribute variables, in that they are a characteristic of a participant which can not be manipulated or measured. The dependent variables, or for the purposes of a validity study, the designated dependent variables from the other instruments are: (1) from the Myers-Briggs Type Indicator, the Feeling, Thinking, Judging, and Perceiving dimensions; (2) from the Strong Interest Inventory, the General Occupational Themes of Social, Investigative, Conventional, and Realistic; and (3) from the Orientation Scales from the Campbell Interest and Skill Inventory, Helping, Analyzing, Organizing, Producing, and Adventuring dimensions.

The important issue related to the selection of variables for this study is that the

choice of using the Myers-Briggs Type Indicator, the General Occupational Themes from the Strong Interest Inventory, and the Orientation Scales from the Campbell Interest and Skill Survey were previously determined by virtue of being included in the archival data. The General Occupational Themes from the Strong are well-documented in empirical studies using similar methodology (Hansen & Swanson, 1983; Haviland & Hansen, 1987; Spokane, 1979) which have been correlated with the Myers-Briggs Type Indicator (MBTI Manual, 1998). Given a choice in the selection of instruments to use for this study, other well-validated personality assessments using continuous scores, rather than dichotomous scores used by the Myers-Briggs, are considered to be better forms of personality measurement within the clinical psychology field (Aiken, 1996).

Participants and Sampling Procedures

The subject population completing all four assessments used in this study consisted of 56 graduate students (18 males and 38 females) enrolled in a graduate-level career development course at a moderate-sized Carnegie Research I university. An additional four students participated in the study, but their responses were excluded from the analysis due to missing data from one of the four assessments. A single-stage sampling procedure was used to recruit a convenience sample of 56 participants from the fall semester of 1998 and the fall and spring semesters of 1999. The subjects ranged in age from 24 to 62 with a mean age of 40 years. All participation was voluntary and an informed consent letter was signed by each subject (see Appendix A).

Location and Setting

The university is a land-grant institution within the higher education system of this western state serving over 23,000 undergraduate and graduate students in the west. The university's population is comprised of 88.8 percent Caucasian students and Asian American, Black, Hispanic, Native American, and other nationalities of students totaled 11.2 percent.

The location for the Fall, 1998 class was the university's urban center. The location for the Spring, 1999 class was the Army National Guard site located in an urban area. The location for the Fall, 1999, was the university's urban center.

Instrumentation

Several instruments were used to facilitate this study. These include: (a) True Colors™ Four Character Cards' Activity and the Word Cluster Instrument, (b) the Myers-Briggs Type Indicator-Form G Self-Scorable Edition (Myers-Briggs, 1987), (c) the 1994 Strong Interest Inventory Form T317 (Harmon, et al., 1994), and (d) the Campbell Interest Inventory and Skill Survey, Product Number 26460 (Campbell, et al., 1992).

The True Colors™ Character Cards' Activity (Lowry, 1988) consist of four separate 4 x 5½ inch cards each with a collage of two characters surrounded by various pictures and symbols to represent the general themes of each personality type on the face of the card with the other side containing text describing each personality type. The illustrated side of the card is printed in the appropriate matching color according to Lowry's (1988) assignment of Blue, Green, Gold and Orange for each personality type. Using the cards consists of an activity to rank each card from first to fourth or "most like

me" to "least like me." The text on each card describing a type is:

> **Blue**: I need to feel unique and authentic. • **Enthusiastic, Sympathetic, Personal** • I look for meaning and significance in life. • **Warm, Communicative, Compassionate** • I need to contribute, to encourage, and to care. • **Idealistic, Spiritual, Sincere** • I value integrity and unity in relationships. • **Peaceful, Flexible, Imaginative** • I am a natural romantic, a poet, a nurturer. • **AT WORK**, I have a strong desire to influence others so they may lead more significant lives. I often work in the arts, communications, education and the helping professions. I am adept at motivating and interacting with others. • **IN LOVE**, I seek harmonious relationships. I am a true romantic and believe in perfect love that lasts forever. I bring drama, warmth, and empathy to all relationships. I enjoy the symbols of romance such as flowers, candlelight, and music and cherish the small gestures of love. • **IN CHILDHOOD**, I was extremely imaginative and found it difficult to fit into the structure of school life. I reacted with great sensitivity to discordance or rejection and sought recognition. I responded to encouragement rather than to competition.
>
> **Green**: I seek knowledge and understanding. • **Analytical, Global, Conceptual** • I live life by my own standards. • **Cool, Calm, Collected** • I need explanations and answers. • **Inventive, Logical, Perfectionistic** • I value intelligence, insight, fairness, and justice. • **Abstract, Hypothetical, Investigative** • I am a natural nonconformist, a visionary, a problem-solver. • **AT WORK**, I am conceptual and an independent thinker. For me, work is play. I am drawn to constant challenge in careers, and like to develop models, explore ideas, or build systems to satisfy my need to deal with the innovative. Once I have perfected an idea, I prefer to move on, leaving the project to be maintained and supported by others. • **IN LOVE**, I prefer to let my head rule my heart. I dislike repetition, so it is difficult for me to continuously express feelings. I believe that once feelings are stated, they are obvious to a partner, I am uneasy when my emotions control me; I want to establish a relationship, leave it to maintain itself, and turn my energies back to my career. • **IN CHILDHOOD**, I appeared to be older than my years and focused on my greatest interests, achieving in subjects that were mentally stimulating. I was impatient with drill and routine, questioned authority, and found it necessary to respect teachers before I could learn from them.
>
> **Gold**: I need to follow rules and respect authority. • **Loyal, Dependable, Prepared** • I have a strong sense of what is right and wrong in life. • **Thorough, Sensible, Punctual** • I need to be useful and to belong. • **Faithful, Stable, Organized** • I value home, family, and tradition. •

Caring, Concerned, Concrete • I am a natural preserver, a parent, a helper. • **AT WORK**, I provide stability and can maintain organization. My ability to handle details and to work hard make me the backbone of many organizations. I believe that work comes before play, even if I must work overtime to complete the job. • **IN LOVE**, I am serious and tend to have traditional, conservative views of both love and marriage. I want a mate who can work along with me, building a secure, predictable life together. I demonstrate love and affection through the practical things I do for my loved ones. • **IN CHILDHOOD**, I wanted to follow the rules regulations of the school. I understood and respected authority and was comfortable with academic routine. I was the easiest of all types of to adapt to the educational system.

Orange: I act on a moment's notice. • **Witty, Charming, Spontaneous** • I consider life as a game, here and now. • **Impulsive, Generous, Impactful** • I need fun, variety, stimulation, and excitement. • **Optimistic, Eager, Bold** • I value skills, resourcefulness, and courage. • **Physical, Immediate, Fraternal** • I am a natural troubleshooter, a performer, a competitor. • **AT WORK**, I am bored and restless with jobs that are routine and structured and satisfied in careers that allow me independence and freedom, while utilizing my physical coordination and my love of tools. I view any kind of tool as an extension of self. I am a natural performer. • **IN LOVE**, I seek a relationship with shared activities and interests. With my mate, I like to explore new ways to energize the relationship. As a lover, I need to be bold and I thrive on physical contact. I enjoy giving extravagant gifts that bring obvious pleasure to my loved one. • **IN CHILDHOOD**, of all types of children, I had the most difficult time fitting into academic routine. I learn by doing and experiencing, rather than by listening and reading. I need physical involvement in the learning process and am motivated by my own natural competitive nature and sense of fun (Lowry, 1988).

The True Colors™ Word Cluster Instrument (Lowry, 1990) is a self-report, self-scorable, forced choice, Likert scale instrument in which individuals are asked to rank five sets of adjectives (for example, loyal, conservative, organized is one word set for the personality type of Gold) for each of the four personality types. Participants rated each word set on a four-point scale from 1 (most unlike) to 4 (most like). The possible range of scores for any one personality type is 0 to 20. The True Colors™ Word Cluster

Instrument is shown in Appendix A.

The Myers-Briggs Type Indicator Form - G Self-Scorable Edition (MBTI; Myers & McCaulley, 1985) is a 126-item, forced-choice, self-report inventory, which attempts to classify individuals according to an adaptation of Carl Jung's theory of conscious psychological type (Willis, 1984). The instrument consists of four separate dichotomous dimensions which produce four numerical scores: Extraversion vs. Introversion, Sensation vs. Intuition, Thinking vs. Feeling, and Judging vs. Perceiving. The numerical scores on each of the preference pairs are compared and the smaller total is subtracted from the larger. The difference is converted into a preference score based on the larger numerical value. These preference scores for each dimension can be converted into four continuous scores where the value of 100 is the dividing point between the preferences. For E, S, T, and J, the preference scores are subtracted from 100, while I, N, F, and P preferences are added to 100. Thus, a score of 40 on the E-I dimension indicates a clear preference for extraversion and converts to a continuous score of 60 from a possible score of 0 to 100.

Extraversion - Introversion (E/I Scale): Myers and McCaulley (1985) offered correlations between MBTI continuous scores with other measures of psychological variables as validity evidence. On the EI dimension, correlations with other scales measuring concepts related to extraversion range from r = -.77 for the Social Extraversion Scale of the Omnibus Personality Inventory (Heist, Yonge, Connelley & Webster, 1968) to r = -.40 on the Social Adjustment scale on Fricke's (1963) Opinion, Attitudes and Interest Scales. Interest scale measures of sales, marketing, leadership,

counseling, and occupational scales measures of travel agents, secretaries, and elected public officials are all related to Extraversion (r = -.79 to -.51), (Myers & McCaulley, 1985). Measures of occupational and social introversion, lack of comfort in the environment, reflective observation, lack of a need for environmental stimulation, interest in privacy and solitude, occupations requiring sustained attention, and interest in concepts and ideas are all related to Introversion (r = .75 to .40), (Myers & McCaulley, 1985).

Sensing - Intuition (S/I Scale): Similarly, the perception functions correlated according to logical expectations with related measures. Negative correlations for the Sensing dimension (r = -.67 to -.40) is found with measures of practical outlook, rule-bound attitude, orientation to economic reality, scales requiring expertise in dealing with tangible objects -- often in a hands-on manner, and occupations requiring attention to detail (Myers & McCaulley, 1985). Positive correlation for the Intuition dimension (r = .62 to .40), is found with measures of experimental attitudes, complexity, artistic and academic interests, autonomy, thinking introversion, lability, creativity, aesthetic and theroretical interest, liberalism, existentialism, self-actualizing, sentience, synergy, inner-directedness, capacity for status, and feeling reactivity (Myers & McCaulley, 1985).

Thinking - Feeling (T/F scale): Within the judging functions, the Thinking dimension's negative correlations (r = -.57 to -.40) is found with counteraction, masculine orientation, abstract conceptualization, dominance, theoretical, distrust, assertiveness, autonomy, radicalism, achievement, aggression, and occupations including science, engineering, military, business and finance, law, and technical fields (Myers & McCaulley, 1985). Positive correlations toward the Feeling dimension (r = .55 to .40) with measures

of concern for others, affiliation and sociability, adaptability of feelings to others' demands, blame and conflict avoidance, and occupations including creative fields in arts and humanities, teaching, religious and social service activities (Myers & McCaulley, 1985).

Judging - Perceiving (J/P scale): Finally, within the orientation dimension of Judging, negative correlations (r = -.59 to -.40) is found with measures of order, rule-bound attitude, stronger superego, endurance, self-control, achievement, counteraction, leadership, work, a strong desire for order and a narrow field of occupations in the biological sciences including nurse practitioner. (Myers & McCaulley, 1985). Positive correlations for the Perceiving dimension (r = .57 to .40) was found with complexity, flexibility, autonomy, sentience, blame avoidance, reality-distance, aesthetic values, change as challenge, intellectual quality, impulse extraversion, succorance, imagination, and occupational relationships with art, languages, and the humanities (Myers & McCaulley, 1985). Based on research reported in the literature review, only the T/F and J/P scales will be used in this study.

The 1994 Strong Interest Inventory Form T317 (Harmon, et al., 1994) consists of 317 questionnaire items inquiring into the respondent's level of interest in a wide range of different areas described by words or short phrases, such as occupations and activities associated with particular occupations, school subjects, types of people, hobbies, and leisure activities. Scores are organized onto a printed report or Profile in the following categories: General Occupational Themes or GOTs (6 scales), Basic Interest Scales or BISs (25 scales), and the Occupational Scales (211 scales representing 109 different

occupations). The Basic Interest Scales (BIS) are the only portion of this instrument utilized in this study and were originated by David P. Campbell in 1968 (Campbell, 1969) to add depth and a better understanding of an individual's scores on the Occupational Scales. The homogeneous scales were constructed by clustering correlated items from the "item-intercorrelation matrices containing correlation coefficients between all possible pairs of items" (SII Manual, 1994, p. 81). The BISs report the consistency of interests or aversions (likes and dislikes) in 25 specific areas, such as art, science, mathematics, nature, writing, teaching, and public speaking.

The Manual (Harmon, et al., 1994) states that the correlations between the 1985 and 1994 scales "amounted to a fine-tuning, without major change in the coverage of the scales" and " that the median correlation for the 21 scales is .987" (p.82). This latest revision removed two scales, Adventure and Domestic Arts and added four new scales; Data Management, Computer Activities, Applied Arts, and Culinary Arts. The BISs were renormed with the 1994 General Reference Sample which consisted of 9,467 women and 9,484 men and each scale's mean and standard deviation of the combined gender sample was set to equal 50 and 10, respectively (Manual, p. 83).

The Campbell Interest and Skill Survey, Product Number 26460 (Campbell, et al., 1992) consists of 200 interest items self-rated for level of interest and 120 skill items self-rated for level of skill for a total of 320 items. Scores are organized into the following 96 interest scales: Orientation Scales (7 scales), Basic Scales (29 scales), Occupational Scales (58 scales), and Special Scales (2 scales). Each of these interest scales has a corresponding skill scale which results in an overall total of 192 scales. Three procedural

checks are also provided to the clinician as a means of assessing an individual's consistency in responses.

Correlations between the Orientation Scales and Basic Scales ranged from .76 to .66, which "indicated a substantial amount of common variance between them" (Pugh, 1998). However, the Orientation Scales (OS) are the only portion of this instrument utilized in this study. The Orientation Scales were constructed using a combination of statistical information and logical reasoning (Pugh, 1998). Norms were generated for the Orientation Scales by calculating a raw score mean of male examinees (N = 3,435) and a raw score mean of female examinees (N = 1,790) and the two means were averaged to generate a mean used in the raw score to standard score conversion formula, thus, giving equal weight to each gender in the norms (Pugh, 1998). The norms have a general population mean of 50 and a standard deviation of 10.

The criterion-related variables utilized in this study were the Orientation Scales of Helping, Analyzing, Organizing, and Producing deduced through descriptions to be similar to the True Colors™ personality types.

Data Collection Procedures

The instruments used for this study were distributed by the Career Development course professor conducting these classes. All students or participants were made aware participation intaking the assessments was on a voluntary basis and not directly tied to any performance criteria in the course. All of the instruments are used as part of the regular career development course in order to familiarize potential counselors with commonly used instruments within the field of Career Development, as well as to provide firsthand

information into their own personality type and career interests. Each subject completed the True Colors™ Character Cards' Activity and the Word Cluster Instrument, the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey. Subjects were provided copies of their results for each assessment via group interpretive sessions provided by the principle and coinvestigators. At the conclusion of each course, the subjects completed a brief questionnaire providing feedback on their reaction to each assessment. Follow-up contact was made to assure completeness of the data sets, with two initial participants' sets of data excluded due to an inability to complete all of the instruments used for this study.

Data Analysis

This section summarizes the steps used in analyzing the scores from the four instruments used in this study. A correlation matrix, using the Spearman Rank Order Correlation for the True Colors™ Character Cards' Activity and the Pearsons Product Moment Correlation for the Word Cluster Instrument was constructed from all of the four instruments' variables. One-way analysis of variance (ANOVA) was used to examine age-related effects with Fisher's Protected Least Significant Differences (LSD) used as a post hoc test on any significant differences found between the three age groups. Independent t-tests was used to examine the effect of gender on participants' responses with Levene's Test for Equality of Variances used as a post hoc test for any significant differences. Table 3.1 presents the variables that were expected to demonstrate meaningful correlations based on the researcher's experience and previous research outlined in the literature review at the beginning of the study.

Table 3.1

Designated Alignment of Variables and Hypotheses

True Colors™	**Myers-Briggs**	**Strong Int.**	**Campbell**	
Independent Variables	Dependent Variables	Dependent Variables	Dependent Variables	Hypotheses
Blue	Feeling	Social	Helping	1 Is there an association between True Colors personality type of Blue and the MBTI Feeling, the SII Social, and the CISS Helping domains?
Green	Thinking	Realistic	Analyzing	2 Is there an association between True Colors personality type of Green and the MBTI Thinking, the SII Realistic, and the CISS Analyzing domains?
Gold	Judging	Conventional	Organizing	3 Is there an association between True Colors personality type of Gold and the MBTI Judging, the SII Conventional, and the CISS Organizing domains?
Orange	Perceiving	Artistic	Adventuring	4 Is there an association between True Colors personality type of Orange and the MBTI Perceiving, the SII Artistic, and the CISS Adventuring domains?

CHAPTER FOUR

Results

The purpose of this research was to conduct a convergent validity study of the True Colors™ Character Cards' Activity and the Word Cluster Instrument with the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey. The results are presented in seven sections: preliminary analysis of True Colors™; age analysis; gender differences; tests of the hypotheses; hypotheses 1, 2, 3, and 4; supplemental analysis of the hypotheses; and correlation matrixes.

Preliminary Analysis of True Colors™

The distributions and accompanying frequencies and percentages for the participants' first choice of personality type with True Colors™ Character Cards' Activity and the Word Cluster Instrument are presented in Table 4.1. The distribution of the participants' first choice for personality type of the Blue dimension for True Colors™ Character Cards' Activity was 30% and for the Word Cluster Instrument the distribution was 19%. The distribution of the participants' first choice for personality type of the Green dimension for the True Colors™ Character Cards' Activity was 21% and for the Word Cluster Instrument the distribution was 20%. The distribution of the participants' first choice for personality type of the Gold dimension for the True Colors™ Character Cards was 29% and for the Word Cluster Instrument the distribution was 32%. The distribution of the participants' first choice for personality type of the Orange dimension for the True Colors™ Character Cards was 21% and for the Word Cluster Instrument the distribution was 27%. Using only the Character Cards' Activity to arrive at personality types, the national distribution (Lowry, 1990) was: Blue 23%, Green 13%, Gold 53%,

and Orange 12%.

Table 4.1

Frequencies and Percentages of Participants' First Choice of Personality Type from the True Colors™ Four Dimensions Using the Character Cards' Activity and Word Cluster Instrument

True Colors™	n	%
Blue		
Character Cards	17	30%
Word Cluster	12	19%
Green		
Character Cards	11	20%
Word Cluster	13	21%
Gold		
Character Cards	16	29%
Word Cluster	20	32%
Orange		
Character Cards	12	21%
Word Cluster	17	27%

Note. Character Cards' Activity N = 56
Word Cluster Instrument's N = 62 is based on 6 ties for first choice color.

The overall means, standard deviations, standard error, and the minimum and maximum ranges for the respective rankings and scores are presented in Table 4.2. A similar table is presented in Appendix D for the Myers-Briggs Type Indicator, Strong Interest Inventory, and the Campbell Interest and Skill Survey. The overall means for the participants' first choice of personality type with the True Colors™ Character Cards for Blue, Green, Gold, and Orange were in a -.21 to .25 range around a midpoint mean of 2.50. This small range of -.21 to .25 around the midpoint mean indicates the results from the True Colors™ Character Cards are a normal distributed sample. The individual score range is 1 to 4.

The overall means for the participants' first choice of personality type with the True Colors™ Word Cluster Instrument for Blue, Green, Gold, and Orange was in a -.41 to .82 range around a midpoint mean of 12.50. This small range of -.41 to .82 around the midpoint mean indicates the results for the True Colors™ Word Cluster Instrument are a normal distributed sample. The individual score range for the Word Cluster Instrument is 5 to 20.

Table 4.2

Overall Means, Standard Deviations, Standard Error, Minimum and Maximum Range for the First Choice of Participants' Personality Type Using the True Colors™ Character Cards' Activity and Word Cluster Instrument

	Overall Means	S.D.	S.E.	Rankings and Scores Minimum	Maximum
True Colors™ Character Cards					
Blue	2.75	1.08	-.10	1	4
Green	2.38	1.10	.12	1	4
Gold	2.61	1.11	-.07	1	4
Orange	2.29	1.16	.29	1	4
True Colors™ Word Cluster					
Blue	12.09	3.76	-.10	5	19
Green	12.16	3.78	-.01	5	19
Gold	13.32	4.18	-.30	5	20
Orange	12.41	4.36	-.01	5	19

Note. Based on 56 participants.

Age Analysis

In this study, the participants' ages ranged from 24 to 62 years. The participants were divided into three arbitrary groups according to age which closely equalized the number of participants in each of the groups. The first group consisted of those under the age of 30 and totaled 16 participants. The second group consisted of those over the age of 30 through the age of 39. The second group's total was 18. The third group consisted of

those 40 years old or over and totaled 22 participants.

One-way analysis of variance (ANOVA) was conducted using the three age groups for each dimension in the four instruments used in this study. The statistically significant differences were found for the True Colors™ Character Cards' and Word Cluster Instrument's Blue dimension, the Myers-Briggs Type Indicator's Extraversion, Introversion and Intuition dimensions, the Strong Interest Inventory's Artistic dimension, and the Campbell Interest and Skill Survey's Adventuring dimension. The analysis of variance of the seven significant differences found with age as a factor are presented in Tables 4.3 through Table 4.9 along with the means from post hoc tests using Fisher's Protected Least Significant Difference of pairwise comparisons.

The age-related differences found in the True Colors™ Character Cards' Blue dimension resulted in a statistically significant overall result, which is presented in Table 4.3. Planned comparisons indicated that with the third group, age 40 to 62, the mean (2.35) was different from the mean (3.17) of the first group, ages 24 to 30. This indicates that the participants aged 40 or above are less likely to rank the Blue personality type as most like them, than the participants aged 24 to 30 years old.

Table 4.3

One-way Analysis of Variance for the Character Cards' Blue Dimension of True Colors™

Source	df	SS	MS	F
Between groups	2	10.88	5.44	5.38*
Within groups	53	53.62	1.01	
Total	55	64.50		

*$p < .05$

The age-related difference found in the True Colors™ Word Cluster Instrument's Blue dimension resulted in a statistically significant overall result presented in Table 4.4. Planned comparisons indicated that for the third age group, age 40 to 62, the mean (11.06) was different from the mean (13.34) of the first group, ages 24 to 30. This result indicates that participants, aged 40 or above, were less likely to rank the Blue personality type as most like them, than the participants aged 24 to 30 years old.

Table 4.4

One-way Analysis of Variance for the Word Cluster Instrument's Blue Dimension of True Colors™

Source	df	SS	MS	F
Between groups	2	99.46	49.73	3.89*
Within groups	53	677.09	12.77	
Total	55	776.55		

*$p < .05$

The age-related difference found in the Myers-Briggs Type Indicator's Extraversion dimension resulted in a significant overall result presented in Table 4.5. Planned comparisons indicated that the mean (92.90) of the second group, ages 30 to 39, was different from the mean (84.21) of the first group, ages 24 to 30. This indicates that participants, aged 30 to 39, were more extroverted than the participants whose ages ranged from 24 to 30. Also, the mean (87.53) of the third group, age 40 or older was different from the mean (92.90) of the second age group, ages 31 to 39 years old. This indicates that the participants with ages ranging from 31 to 39 years old were more extroverted than the participants whose age was 40 or older.

Table 4.5

One-way Analysis of Variance for the Extraversion Dimension of the Myers-Briggs Type Indicator

Source	df	SS	MS	F
Between groups	2	576.09	288.04	7.85*
Within groups	53	1943.89	36.68	
Total	55	2519.98		

*$p < .05$

The age-related difference found in the Myers-Briggs Type Indicator's Introversion dimension resulted in a significant overall result presented in Table 4.6. Planned comparisons indicated that with the mean (114.29) third group, age 40 to 62, was different from the mean (109.79) of the first group, ages 24 to 30. This indicates that the participants whose age was 40 or above are more introverted than the participants whose ages ranged from 24 to 30.

Table 4.6

One-way Analysis of Variance for the Introversion Dimension of the Myers-Briggs Type Indicator

Source	df	SS	MS	F
Between groups	2	248.15	124.08	3.34*
Within groups	53	1968.69	37.15	
Total	55	2216.84		

*$p < .05$

The age-related difference found in the Myers-Briggs Type Indicator's Intuition dimension resulted in a significant overall result presented in Table 4.7. Planned comparisons indicated that with the mean (110.29) third group, age 40 to 62, was different from the mean (115.48) of the first group, ages 24 to 30. This indicates that participants whose age ranged from 24 to 30 were significantly more likely to have a

preference for Intuition than those participants whose age was 40 or older in this study's sample.

Table 4.7

One-way Analysis of Variance for the Intuition Dimension of the Myers-Briggs Type Indicator

Source	df	SS	MS	F
Between groups	2	355.97	177.98	3.59*
Within groups	53	2624.87	49.53	
Total	55	2980.84		

*$p < .05$

The age-related difference found in the Strong Interest Inventory's Artistic dimension resulted in a significant overall result presented in Table 4.8. Planned comparisons indicated that the mean (43.50) of the second group, ages 31 to 39, was different from the mean (53.07) of the first group, ages 24 to 30. This indicates that the participants whose ages ranged from 24 to 30 years old were more likely to have artistic interests than the participants whose ages ranged from 31 to 39 years old.

Table 4.8

One-way Analysis of Variance for the Artistic Dimension of the Strong Interest Inventory

Source	df	SS	MS	F
Between groups	2	709.55	354.78	3.56*
Within groups	53	5271.30	90.66	
Total	55	5980.86		

*$p < .05$

An analysis of variance with age-related differences with the Campbell Interest and Skill Survey's Adventuring dimension resulted in a statistically significant overall result, and is presented in Table 4.9. Planned comparisons indicated that the mean (64.40) of the

second group, ages 31 to 39 was different from the mean (51.31) of the first group, ages 24 to 30. This indicates that the participants whose ages ranged from 31 to 39 were more likely to have an adventuring, risk-taking interests than the participants whose ages ranged from 24 to 30 years old. Also, the mean (46.94) third group, ages 40 to 62 was different from the mean (64.40) of the second group, ages 31 to 39. This indicates that the participants whose ages ranged from 31 to 39 years old were significantly more likely to have an adventuring, risk-taking interests than the participants whose ages ranged from 40 to 62 years old. In other words, participants aged 31 to 39 were significantly more interested in risk-taking and adventuring interests than the younger and older age groups.

Table 4.9

One-way Analysis of Variance for the Adventuring Dimension of the Campbell Interest and Skill Survey

Source	df	SS	MS	F
Between groups	2	1980.67	990.33	8.02*
Within groups	53	6545.55	123.50	
Total	55	8526.21		

*$p < .05$

Gender Differences

The sample for this study was composed of 38 females (68%) and 18 males (32%). The t-test for independent samples was used to see if differences due to the effect of gender could be found on any of the dimensions from each assessment used in this study. These results are presented in Table 4.10.

Table 4.10

Means and Standard Deviations for Variables with Significance on Gender Differences for the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey

Assessment	Dimensions	Gender	Mean	Standard Deviation	*t*
Myers-Briggs Type Indicator	Thinking	Male	83.00	9.76	
		Female	91.50	5.75	3.42**
	Feeling	Male	107.05	6.19	-2.5*
		Female	111.15	5.34	
Strong Interest Inventory	Realistic	Male	51.22	9.92	2.23*
		Female	45.50	8.51	
	Enterprising	Male	42.27	10.86	-2.27*
		Female	53.60	9.17	
Campbell Skill and Interest Inventory	Creating	Male	47.22	10.50	-2.16*
		Female	53.21	9.29	
	Adventuring	Male	61.33	9.94	4.27**
		Female	48.05	11.26	

Note. Based on 56 subjects (18 males, 38 females).
*$p < .05$ **$p < .01$

No gender differences were found on any of the True Colors™ Character Cards' Activity or the Word Cluster Instruments' dimensions. However, significant differences between gender groups were found for the other assessments used in this study.

The Myers-Briggs Type Indicator average scores on the Thinking dimension for males was found to be higher than females' average scores. The average scores on the Feeling dimension showed females averaged higher than males. This study's results reflected the same gender differences Form G of the Myers-Briggs Type Indicator also found in national studies (Manual, 1998, p. 12). Form M was released in 1999, with the re-standardization of the T/F dimension, which compensates for these gender differences.

The results of this study also showed gender differences found by earlier research investigating interests. In this study, the Strong Interest Inventory's General Occupational Themes show males averaged higher than females on the Realistic dimension. The Strong's scale average is 50. The difference between theses two means is 5.72 points. Males scored 1.22 points above the average and females scored 4.50 points below the average of 50. Females averaged higher than males on the Enterprising dimension. The two groups' means indicate that the average Enterprising score for males was significantly lower than the average score for females.

This study also found the Campbell Skill and Interest Inventory results consistent with the reported results for the same dimensions in the assessment's 1992 Manual. The results of this study found that females averaged higher than males on the Creating dimension. The mean difference is 5.98. A score of 50 would represent this scale's average score. The average score for males was significantly higher than the average score for females on the Adventuring dimension.

Table 4.1 (p. 70) previously presented results of the t-tests supporting the above conclusions. None of the other dimensions (e.g., extraversion, introversion, sensing, intuition, perceiving or judging) had significant gender differences in the Myers-Briggs within this study. Thus, on 6 out of 29 possible dimensions involved in this study, men and women scored differently with these four instruments.

Tests of the Hypotheses

In the review of literature, Table 2.5 (p. 52) presented the associations from the review, which formulated this study's hypotheses. Table 4.11 repeats the same table, with the addition of the expected positive and negative associations for the hypotheses.

Table 4.11

Proposed Directional Correlations of the True Colors™ Character Cards Activity and Word Cluster Instrument Personality Types, the Myers-Briggs Type Indicator Dichotomous Scales, the Strong Interest Inventory General Occupational Themes, and the Campbell Interest and Skill Survey Orientation Scales

True Colors™ Personality Types	MBTI Dichotomous Functions	SII General Occupational Themes	CISS Orientation Scales
Blue Focus on harmonious relationships; compassionate; authentic; warm; communicative.	**Feeling** Value-based decision-making with a consideration for the consequences on others.	**Social** Prefer working with individuals and groups; helping, caring, and nurturing others; teaching; solves problems through feelings and interaction with others.	**Helping** Aiding others through teaching, healing, and counseling; value compassion, interpersonal harmony; nurturing and enjoy solving human problems; giving service to others.
Green Curious; seeking; inventive; theoretical; complex; philosophical; principled; rational.	**Thinking** Logical-based decision-making with a inquiry; consideration for fairness; cause and effect.	**Realistic** Prefer outdoors and working with tools; prefer action concrete problems; higher risk-taking; value tradition, common sense.	**Analyzing** Analyzing data using mathematics and carrying out scientific experiments.
Gold Organized; conventional; orderly; procedural; practical; responsible; tradition; loyal.	**Judging** Prefer to plan ahead to avoid stresses/changes at the last minute; organized.	**Conventional** Prefer organizing, detail, accuracy math, data, management, work well in large corporations; value stability.	**Organizing** Organizing the work of others; managing and monitoring financial performance.
Orange Active; realistic; daring; spontaneous; opportunistic.	**Perceiving** A high value for spontaneity; open and adaptable to change.	**Artistic** Focus on self-expression, aesthetics and art; creative; value originality, independence, imagination and beauty.	**Adventuring** Focus on activities involving risk-taking, teamwork; value physical challenges and competitive outlets; are energized by strenuous or dangerous situations.

Note. Excerpted from Personal Keys to Success Lowry (1988), MBTI Manual (1998), SII Manual (1994), & CISS Manual (1992). Dotted lines reflect expected negative correlations and solid lines reflect expected positive correlations.

The Spearman Rank Order Correlation was used to test the True Colors™

Character Cards' associations contained in the hypotheses of this study, which are presented in Table 4.12 (p. 81). Pearson's Product Moment Correlation was used to test the True Colors™ Word Cluster Instrument associations contained in the hypotheses of this study, which are presented in Table 4.13 (p. 82). Note, as the MBTI Manual (Briggs-Myers, et al., 1994) pointed out a correlation of at least .20 indicates that at least 4 percent of the variance is shared among the two variables being correlated and validity coefficients in the behavioral sciences are typically lower than reliability coefficients. Cohen (1988) states that these type of correlations between personality and social psychology variables are considered large if they are approximately r = .5 or have 25 percent of the shared variance. Correlations of .20 are considered small-to medium-sized effects, which are quite common and often meaningful. Also, for purposes of the underlying theory, it is equally important that certain correlations are not significant, as in the case of the Myers-Brigg's continuous dimensions, which are opposing functions contained on one continuum. Note, in the discussion of each hypothesis, the significance ratings of all correlations have been made in accordance with Cohen's (1988) table of correlations.

Table 4.12

Spearman Rank Order Correlation Results for the True Colors™ Character Cards Activity Personality Types, the Myers-BriggsType Indicator Dichotomous Scales, the Strong Interest Inventory General Occupational Themes, and the Campbell Interest and Skill Survey Orientation Scales

True Colors™ Personality Types	MBTI Dichotomous Functions	SII General Occupational Themes	CISS Orientation Scales
	.49*	.51*	.28
Blue Focus on harmonious relationships; compassionate; authentic; warm; communicative.	**Feeling** Value-based decision-making with a consideration for the consequences on others.	**Social** Prefer working with individuals and groups; helping, caring, and nurturing others; teaching; solves problems through feelings and interaction with others.	**Helping** Aiding others through teaching, healing, and counseling; value compassion, interpersonal harmony; nurturing and enjoy solving human problems; giving service to others.
	-.42*		.32*
Green Curious; seeking; inventive; theoretical; complex; philosophical; principled; rational.	**Thinking** Logical-based decision-making with a inquiry; consideration for fairness; cause and effect.	**Realistic** Prefer outdoors and working with tools; prefer action concrete problems; higher risk-taking; value tradition, common sense.	**Analyzing** Analyzing data using mathematics and carrying out scientific experiments.
	-.41*		
Gold Organized; conventional; orderly; procedural; practical; responsible; tradition; loyal.	**Judging** Prefer to plan ahead to avoid stresses/changes at the last minute; organized.	**Conventional** Prefer organizing, detail, accuracy math, data, management, work well in large corporations; value stability.	**Organizing** Organizing the work of others; managing and monitoring financial performance.
	.37*	-.32*	
Orange Active; realistic; daring; spontaneous; opportunistic.	**Perceiving** A high value for spontaneity; open and adaptable to change.	**Artistic** Focus on self-expression, aesthetics and art; creative; value originality, independence, imagination and beauty.	**Adventuring** Focus on activities involving risk-taking, teamwork; value physical challenges and competitive outlets; are energized by strenuous or dangerous situations.

Note. Dotted lines reflect expected negative correlations and solid lines reflect expected positive correlation

Table 4.13

Pearson Product-Moment Correlations for the True Colors™ Word Cluster Instrument Four Personality Types, the Myers-Briggs Type Indicator Dichotomous Scales, the Strong Interest Inventory General Occupational Themes, and the Campbell Interest and Skill Survey Orientation Scales

True Colors™ Personality Types	MBTI Dichotomous Functions	SII General Occupational Themes	CISS Orientation Scales
	.53*	.41*	.26*
Blue Focus on harmonious relationships; compassionate; authentic; warm; communicative.	**Feeling** Value-based decision-making with a consideration for the consequences on others.	**Social** Prefer working with individuals and groups; helping, caring, and nurturing others; teaching; solves problems through feelings and interaction with others.	**Helping** Aiding others through teaching, healing, and counseling; value compassion, interpersonal harmony; nurturing and enjoy solving human problems; giving service to others.
	-.38*		
Green Curious; seeking; inventive; theoretical; complex; philosophical; principled; rational.	**Thinking** Logical-based decision-making with a inquiry; consideration for fairness; cause and effect.	**Realistic** Prefer outdoors and working with tools; prefer action concrete problems; higher risk-taking; value tradition, common sense.	**Analyzing** Analyzing data using mathematics and carrying out scientific experiments.
	-.46*	.29*	.28*
Gold Organized; conventional; orderly; procedural; practical; responsible; tradition; loyal.	**Judging** Prefer to plan ahead to avoid stresses/changes at the last minute; organized.	**Conventional** Prefer organizing, detail, accuracy math, data, management, work well in large corporations; value stability.	**Organizing** Organizing the work of others; managing and monitoring financial performance.
	.32*		
Orange Active; realistic; daring; spontaneous; opportunistic.	**Perceiving** A high value for spontaneity; open and adaptable to change.	**Artistic** Focus on self-expression, aesthetics and art; creative; value originality, independence, imagination and beauty.	**Adventuring** Focus on activities involving risk-taking, teamwork; value physical challenges and competitive outlets; are energized by strenuous or dangerous situations.

Note. Dotted lines reflect expected negative correlations and solid lines reflect expected positive correlations

Hypotheses 1, 2, 3, and 4

Hypothesis 1

Note, since the Character Cards' Activity and Word Cluster Instrument's results seem to mirror one another the discussion of the hypotheses will discuss the Character Cards' results. Hypothesis 1, presented in Table 4.14, stated that there is a positive association between True Colors™ personality type of Blue and MBTI Feeling, SII Social, and CISS Helping domains. As expected, the Blue dimension resulted in significant correlations with the Myers-Briggs' Feeling dimension (.49), the SII Social dimension (.51) were large indicating support for the convergent validity. The correlation with the CISS Helping dimension (.28) was also significant. These results support Hypothesis 1.

Table 4.14

Correlation Coefficients Between True Colors™ Blue Dimension for the Character Cards' Activity and Word Cluster Instrument, the Myers-Briggs Type Indicator's Feeling Dimension, the Strong Interest Inventory's Social Dimension, and the Campbell Interest and Skill Survey's Helping Dimension

True Colors™ Typing System	Myers-Briggs Type Indicator	Strong Interest Inventory	Campbell Interest and Skill Survey
Blue	Feeling	Social	Helping
Character Cards	.49*	.51*	.28*
Word Cluster Instrument	.53*	.41*	.26*

Note. Correlations based on 56 subjects (18 males, 38 females).
Conventional notation for MBTI correlations are: positive correlations are associated with I, N, F, P and negative correlations are associated with E, S, T, J.
*$p < .05$.

Hypothesis 2

Hypothesis 2 stated that there is a negative association between True Colors™ personality type of Green and the MBTI Thinking dimension and positive associations

between the SII Realistic, and the CISS Analyzing domains. Table 4.15 presents the results of moderate significant correlations found between the Myers-Briggs Thinking dimension (-.42) and the CISS Analyzing dimension (.32) indicated support for convergent validity of these instruments. However, the SII Realistic dimension (.13) non significant results do not support convergent validity. Therefore, partial support was found for Hypothesis 2.

Table 4.15

Correlation Coefficients Between True Colors™ Green Dimension for the Character Cards' Activity and Word Cluster Instrument, Myers-Briggs Type Indicator's Thinking Dimension, the Strong Interest Inventory's Realistic Dimension, and the Campbell Interest and Skill Survey's Analyzing Dimension

True Colors™ Typing System	Myers-Briggs Type Indicator	Strong Interest Inventory	Campbell Interest and Skill Survey
Green	Thinking	Realistic	Analyzing
Character Cards	-.42*	.13	.32*
Word Cluster Instrument	-.38*	.05	.09

Note. Correlations based on 56 subjects (18 males, 38 females).
Conventional notation for MBTI correlations are: positive correlations are associated with I, N, F, P and negative correlations are associated with E, S, T, J.
*$p < .05$.

Hypothesis 3

Table 4.16 presents the results for Hypothesis 3, which stated that there is a negative association between True Colors™ personality type of Gold and the MBTI Judging dimension and positive associations between the SII Conventional, and the CISS Organizing domains. The Gold dimension resulted in a negative, moderately significant correlation with the Myers-Briggs Judging dimension (-.41), which indicated strong support for the convergent validity. The SII Conventional dimension (.10) and the CISS

Organizing dimension (-.02) non significant results do not support the convergent validity. Therefore, Hypothesis 3 is partially supported.

Table 4.16

Correlation Coefficients Between True Colors™ Gold Dimension for the Character Cards' Activity and Word Cluster Instrument, the Myers-Briggs Type Indicator's Judging Dimension, the Strong Interest Inventory's Conventional Dimension, and the Campbell Interest and Skill Survey's Organizing Dimension

True Colors™ Typing System	Myers-Briggs Type Indicator	Strong Interest Inventory	Campbell Interest and Skill Survey
Gold	Judging	Conventional	Organizing
Character Cards	-.41*	.10	-.02
Word Cluster Instrument	-.46*	.29*	.28*

Note. Correlations based on 56 subjects (18 males, 38 females).
Conventional notation for MBTI correlations are: positive correlations are associated with I, N, F, P and negative correlations are associated with E, S, T, J.
*$p < .05$.

Hypothesis 4

Table 4.17 presents the results for Hypothesis 4, which stated that here is a positive association between True Colors™ personality type of Orange and the MBTI Perceiving, the SII Artistic, and the CISS Adventuring domains. The Orange dimension resulted in a positive significant correlation with the Myers-Briggs Perceiving dimension (.37), which indicates support for the convergent validity. The Orange dimension resulted in a negative significant correlation with the SII Artistic dimension (-.32) and a non significant correlation with the CISS Adventuring dimension (-.08). Therefore, partial support was found for Hypothesis 4.

Table 4.17

Correlation Coefficients Between True Colors™ Orange Dimension for the Character Cards' Activity and Word Cluster Instrument, the Myers-Briggs Type Indicator's Perceiving Dimension, the Strong Interest Inventory's Artistic Dimension, and the Campbell Interest and Skill Survey's Adventuring Dimension

True Colors™ Typing System	Myers-Briggs Type Indicator	Strong Interest Inventory	Campbell Interest and Skill Survey
Orange	Perceiving	Artistic	Adventuring
Character Cards	.37*	-.32*	-.08
Word Cluster Instrument	.32*	-.04	.09

Note. Correlations based on 56 subjects (18 males, 38 females).
Conventional notation for MBTI correlations are: positive correlations are associated with I, N, F, P and negative correlations are associated with E, S, T, J.
*$p < .05$.

Supplemental Analysis of the Hypotheses

A summary of the Spearman and Pearsons correlations between the dimensions assigned to each hypotheses are reported in Table 4.18. Additionally, these results are divided into two groups: 1) measurements of personality consisting of True Colors™ and the Myers-Briggs Type Indicator and 2) measurements of interests consisting of the Strong Interest Inventory and the Campbell Interest and Skill Survey.

The hypotheses results significantly support the convergent validity between the two personality assessments of True Colors™ and Myers-Briggs Type Indicator for the Character Cards' Activity and the Word Cluster Instrument. The hypotheses results demonstrate partial support for the convergent validity between True Colors™ and the two interest assessments.

Table 4.18

Results of the Spearman and Pearsons Product Moment Correlations Summarized According to the Hypotheses for the True Colors™ Character Cards' Activity and Word Cluster Instrument, Myers-Briggs Type Indicator, Strong Interest Inventory, and the Campbell Interest and Skill Survey Dimensions

Measurements of Personality			**Measurements of Interests**		
True Colors™ Typing System	Myers-Briggs Type Indicator		Strong Interest Inventory	Campbell Interest and Skill Survey	
Independent Variable	Dependent Variable	Hypothesis	Dependent Variable	Dependent Variable	Hypothesis
Blue	Feeling		Social	Helping	
Character Cards	.49*	1 a. Supported	.51*	.28*	1 a. Supported
Word Cluster Instrument	.53*	1 b. Supported	.41*	.26*	1 b. Supported
Green	Thinking		Realistic	Analyzing	
Character Cards	-.42*	2 a. Supported	.13	.32*	2 a. Partially Supported
Word Cluster Instrument	-.38*	2 b. Supported	.05	.09	2 b. Not Supported
Gold	Judging		Conventional	Organizing	
Character Cards	-.41*	3 a. Supported	.10	-.02	3 a. Not Supported
Word Cluster Instrument	-.46*	3 b. Supported	.29*	.28*	3 b. Supported
Orange Perceiving			Artistic	Adventuring	
Character Cards	.37*	4 a. Supported	-.32*	-.08	4 a. Not Supported
Word Cluster Instrument	.32*	4 b. Supported	-.04	.09	4 b. Not Supported

Note. Correlations based on 56 subjects (18 males, 38 females).
Conventional notation for MBTI correlations are: positive correlations are associated with I, N, F, P and negative correlations are associated with E, S, T, J.
*$p < .05$.

Correlation Matrixes

Intercorrelations of True Colors™ Scores

The intercorrelations for both True Colors™ Character Cards' Activity and Word Cluster Instrument using the Spearman Product Moment correlations are reported in Table 4.19. The intercorrelations of the True Colors™ Character Cards' Activity with the Word Cluster Instrument for each color were: the Orange dimension ($r = .62$, $df = 54$, $p < .05$), the Gold dimension ($r = .63$, $df = 54$, $p < .05$), the Blue dimension ($r = .75$, $df = 54$, $p < .05$), and the Green dimension ($r = .75$, $df = 54$, $p < .05$). This indicates that the two methods are correlated moderately high, but not so high as to be essentially equivalent measures. The Orange and Gold intercorrelations are considered to be a moderately strong positive relationship. The Blue and Green intercorrelations are considered to be a strong positive relationship.

Table 4.19

Intercorrelations for the True Colors™ Character Cards' Activity and Word Cluster Instrument

True Colors ™	Character Cards				Word Cluster Instrument			
Dimensions	Orange	Gold	Blue	Green	Orange	Gold	Blue	Green
Character Cards								
Orange	-----	-.42*	-.33*	-.28*	.62*	-.34*	-.22*	-.03
Gold		-----	-.25*	-.34*	-.24*	.63*	-.10	-.43*
Blue			-----	-.36*	-.34*	-.11	.75*	-.27*
Green				-----	-.09	-.19	-.38*	.75*
Word Cluster Instrument								
Orange					-----	-.52*	-.40*	-.08
Gold						-----	-.17	-.35*
Blue							-----	-.35*
Green								-----

Note. $|r| \geq 20$, $*p \leq .05$

True Colors™ Character Cards' Activity and Word Cluster Instrument with the Myers-Briggs Type Indicator

Table 4.20 presents the correlations for True Colors™ Character Cards' Activity and the Word Cluster Instrument with the Myers-Briggs Type Indicator. Many of the correlations are not significant and many are significant as hypotheses correlations. However, in the case of the Character Cards' Blue dimension, it appears to have correlated equally well with 3 of the 4 Myers-Briggs dichotomous dimensions; Extraversion, Intuition, and Feeling. In Chapter Two, the Myers-Briggs Manual was quoted as stating that the four dichotomous dimensions of the Myers-Briggs "tend to be independent of each other" (p.150). Thus, it appears the Blue dimension is measuring Extraversion, Intuition, and Feeling. The Gold dimension's results of correlating significantly only with the predicted Myers-Briggs dimension of Perceiving positively and conversely negatively with Judging proved to be more meaningful for the purposes of this study.

The True Colors™ Character Cards' Activity and Word Cluster Instrument seem to mirror each other's results closely. Therefore, the remaining discussion will deal only with the Character Cards' results. As predicted in the hypotheses, the Blue dimension resulted in a positive significant correlation with the Feeling dimension (.49); the Green dimension resulted in a negative significant correlation with the Thinking dimension (-.42); the Gold dimension resulted in a negative significant correlation with the Judging dimension (-.41) and finally, the Orange dimension resulted in a positive significant correlation with the Perceiving dimension (.37).

Table 4.20

Correlation Coefficients for the True Colors™ Character Cards' Activity and Word Cluster Instrument with the Myers-Briggs Type Indicator's Dimensions

True Colors™	Myers-Briggs Type Indicator							
Character Cards	E	I	S	N	T	F	J	P
Blue	.52*	-.42*	-.38*	.42*	-.55*	.49*	-.10	.10
Green	-.28*	.18	-.12	.05	-.42*	.48*	.10	-.02
Gold	-.32*	.30*	.35*	-.43*	.16	-.24*	-.41*	.45*
Orange	.08	-.07	.12	-.08	-.05	.23	-.41*	.37*
Word Cluster Instrument								
Blue	.52*	-.42*	-.16	.22*	-.56*	.53*	-.14	.10
Green	-.23*	.15	-.11	.10	-.38*	.39*	-.00	.12
Gold	-.37*	.35*	.34*	-.41*	.09	-.09	-.46*	.50*
Orange	.15	-.16	-.09	.15	.08	-.01	-.30*	.32*

Note. $|r| \geq 20$, $p \leq .05$

Predicted correlations underlined.

True Colors™ Character Cards' Activity and Word Cluster Instrument with the Strong Interest Inventory

Table 4.21 presents the correlation coefficients computed to examine the relationships between the True Colors™ Character Cards' Activity and Word Cluster Instrument with the Strong Interest Inventory dimensions. As predicted, the Blue dimension correlated significantly with the Social dimension (.51). The Green dimension did not significantly correlate with the Realistic dimension (.13). The Gold dimension's correlation with the Conventional dimension (.10) was not significant. The Orange dimension resulted in a negative significant correlation with the Artistic dimension (-.32), which indicates the Orange dimension is not similar to the Artistic dimension.

True Colors™ Character Cards' Activity and Word Cluster Instrument with the Campbell Interest and Skill Survey

Table 4.21 also presents the correlation coefficients computed to examine the relationships between the True Colors™ Character Cards' Activity and Word Cluster Instrument with the Campbell Interest and Skill Survey dimensions. As predicted, the Blue dimension resulted in a positive significant correlation with the Helping dimension (.28). The Green dimension resulted in a positive significant correlation with the Analyzing dimension (.32). The Gold dimension resulted in an unpredicted negative non significant correlation with the Organizing dimension (-.02). The Orange dimension resulted in a non significant correlation with the Adventuring dimension (-.08). These results indicate little support for the convergent validity between True Colors™ and the Strong Interest Inventory and Campbell Interest and Skill Survey.

Table 4.21

Correlation Coefficients for the True Colors™ Character Cards' Activity and Word Cluster Instrument with the Strong Interest Inventory and the Campbell Interest and Skill Survey Dimensions

True Colors™	Strong Interest Inventory						Campbell Interest and Skill Survey						
Character Cards	R	I	A	S	E	C	I	O	H	C	A	P	A
Blue	-.06	.08	.47*	.51*	.30*	.24*	.23*	.11	.28*	.42*	-.10	-.14	-.16
Green	.13	.29*	.06	-.25*	-.31*	-.10	-.10	.02	-.21*	-.07	.32*	.17	-.12
Gold	.05	.10	-.17	-.06	-.05	.10	-.05	-.02	.06	-.05	.00	.14	.17
Orange	-.13	-.28*	-.32*	-.19	.04	-.25*	-.09	-.13	-.14	-.28*	-.24*	-.19	-.08
Word Cluster Instrument	R	I	A	S	E	C	I	O	H	C	A	P	A
Blue	-.20	-.09	.27*	.41*	.25*	.09	.18	.00	.26*	.29*	-.24*	-.30*	-.13
Green	.05	.11	.08	-.24*	-.25*	-.17	-.23*	-.08	-.26*	-.10	.09	.06	-.19
Gold	.07	.02	-.27*	.01	.03	.29*	.02	.28*	.11	-.18	.09	.14	.12
Orange	.13	-.03	-.04	-.17	-.01	-.22*	-.05	-.20	-.15	-.02	.02	.07	.09

Note. $|r| \geq .20, p \leq .05$

Predicted correlations underlined.

CHAPTER FIVE

Chapter Five provides an overview of this study presented in five sections. A summary, limitations, and conclusions of the study are discussed. Implications in relation to the application of True Colors™ Character Cards' activity and the Word Cluster Instrument are discussed. Finally, recommendations for future research are given.

Summary

The primary research purpose for this study was to test the convergent validity of True Colors™ dimensions with another personality typing assessment and career interest assessments. Since the use of personality and interest assessments in tandem is a common practice in the fields of education, career counseling, and business training, using this same combination of assessments for this study was appropriate.

The following hypotheses were tested in this study:

Hypothesis 1. There is a positive association between True Colors™ personality type of Blue and the MBTI Feeling, the SII Social, and the CISS Helping domains.

Hypothesis 2. There is a negative association between True Colors™ personality type of Green and the MBTI Thinking and positive associations between the SII Realistic, and the CISS Analyzing domains.

Hypothesis 3. There is a negative association between True Colors™ personality type of Gold and the MBTI Judging and positive associations between the SII Conventional, and the CISS Organizing domains.

Hypothesis 4. There is a positive association between True Colors™ personality type of Orange and the MBTI Perceiving, the SII Artistic, and the CISS Adventuring domains.

The sample for this study was composed of graduate students enrolled in a graduate-level career development course at a moderate-sized Carnegie Research I university. There were 56 participants in the study. The participants ages ranged from 24 to 62. The sample was 68% female and 32% male.

Assessments used in this study were: True Colors™ Character Cards' Activity and the Word Cluster Instrument, the Myers-Briggs Type Indicator-Form G Self-Scorable Edition (Myers-Briggs, 1987) to assess Myers-Briggs personality type, the 1994 Strong Interest Inventory-Form T317 (Harmon, et al., 1994), and the Campbell Interest Inventory and Skill Survey, Product No. 26460 (Campbell, et al., 1992) to assess career interests.

The purpose of this study was to conduct a convergent validity study of the True Colors™ Character Cards' Activity and Word Cluster Instrument with the corresponding dimensions from the Myers-Briggs Type Indicator, the Strong Interest Inventory, and the Campbell Interest and Skill Survey. An examination of age and gender effects on the participants' responses developed from the original questions involved in this study.

One-way analysis of the three age groups for each of the dimensions of all of the personality assessments found significant differences for the True Colors™ Character Cards' Activity and Word Cluster Instrument's Blue dimension and the Myers-Briggs Type Indicator's Extraversion, Introversion, and Intuition dimensions; the Strong Interest Inventory's Artistic dimension; and the Campbell Interest and Skill Survey's Adventuring dimension. Therefore, age is a factor in personality assessments and interest inventories used in this study with this sample. The administration of both interest assessments and the Myers-Briggs used in this study is recommended to populations of fifteen years of age or

older.

The t-test for independent samples was used to see if differences from a gender effect could be found on dimensions from each assessment used in this study. Non significant gender differences were found for both the True Colors™ Character Cards' Activity and the Word Cluster Instrument. However, significant gender differences were found on the Myers-Briggs Type Indicator Thinking - Feeling dimension as reported from the review of literature. The representative characteristics for the Thinking - Feeling dimension reflect basic socialization gender differences. This fact is supported in the MBTI Manual (Myers, McCaulley, Quenk, & Hammer, 1998) which stated the Thinking - Feeling dimension is "the only dichotomy of the MBTI to produce consistently different percentages among males and females" (p. 264).

The Strong Interest Inventory resulted in gender differences on two dimensions: Realistic and Enterprising. The norming sample of 18,000 for the General Occupational Themes found males scored about 7 points higher than females on the Realistic dimension and the reverse for the Enterprising dimension (Manual, 1994, p. 305). Historically, males have scored higher than females on the Realistic, Enterprising, and Investigative dimensions which reflects the more traditional male-oriented occupations. Conversely, females traditionally score higher than males on the Social, Artistic, and Conventional dimensions.

Finally, the Campbell Skill and Interest Inventory gender differences were consistent with the results of the national norm group reported in the 1992 Manual. The Results of this study also found that females averaged significantly higher than males on

the Creating dimension and males averaged significantly higher than females on the Adventuring dimension.

As provided in the review of the literature, Hammer & Kummerow (1996) reported the correlation between the Myers-Briggs Feeling dimension and the Strong Interest Inventory Social dimension as moderately statistically significant. The correlations for Hypothesis 1 support that finding with moderate significant correlations between both the True Colors™ Character Card of Blue and the True Colors™ Word Cluster Instrument Blue dimensions with the Myers-Briggs Feeling and the Strong Interest Inventory Social dimensions. These results also agree with Hammer and Kummerow's (1996) moderate correlation findings between the Social dimension of the Strong Interest Inventory and the Artistic dimension of the Campbell Skill and Interest Inventory.

Hypothesis 2 stated there is an association between True Colors™ personality type of Green and the MBTI Thinking, the SII Realistic, and the CISS Analyzing domains. Moderate statistically significant correlations were found between the Myers-Briggs Thinking dimension and the Campbell Skill and Interest Inventory Analyzing dimension. A low correlation was found with the Strong Interest Inventory Realistic dimension with the Character Cards and the Word Cluster Instrument. Non significant correlations were found with the Strong Interest Inventory Realistic dimension and the Campbell Skill and Interest Inventory Analyzing dimension. This lower correlation with the Realistic dimension was unexpected due to Saladin's (1995) study which found a statistically moderate correlation between the Realistic and Analyzing dimensions. The non-significant association between the Realistic dimension is also surprising, since as reported in Chapter

Two, the Myers-Briggs dimension of Thinking was found to be moderately correlated with the Realistic dimension of the Strong Interest Inventory (Hammer & Kummerow, 1996). For Hypothesis 2, the results partially supported the Character Cards' Activity and the Word Cluster Instrument.

Hypothesis 3 stated there is an association between True Colors™ personality type of Gold and the MBTI Judging, the SII Conventional, and the CISS Organizing domains. The True Colors™ Character Cards' Gold dimension resulted in a moderate statistically significant correlation with the Myers-Briggs Judging dimension. Correlations with the Strong Interest Inventory Conventional dimension and the Campbell Skill and Interest Inventory Organizing dimension were not significant. The low correlation was unexpected since Saladin's (1995) study found the Conventional and Organizing dimensions correlated significantly. The results of this study indicate the Gold dimension is consistently distinct from these two dimensions as it relates to the True Colors™ Character Cards' Activity and moderately associated with the Myers-Briggs Judging dimension.

The results for the True Colors™ Word Cluster Instrument Gold dimension were moderate statistically significant correlation with the Myers-Briggs Judging dimension, the Strong Interest Inventory Conventional dimension, and the Campbell Interest and Skill Survey Organizing dimension. As reported in Chapter Two, Hammer and Kummerow's (1996) study found that the Myers-Briggs Judging dimension had a moderate correlation with the Conventional dimension of the Strong Interest Inventory. This study's results support the results of Hammer & Kummerow (1996) for these two dimensions. For Hypothesis 3, the results do not support the Character Cards' Activity associations and

do support the Word Cluster Instrument.

Hypothesis 4 stated there is an association between True Colors™ personality type of Orange and the MBTI Perceiving, the SII Artistic, and the CISS Adventuring domains. The results for the True Colors™ Character Cards' Orange dimension resulted in moderate statistically significant correlations with the Myers-Briggs Perceiving and the Strong Interest Inventory Artistic dimensions. As reported in Chapter Two, Hammer and Kummerow's (1996) study resulted in a lower correlation between the Myers-Briggs Perceiving and the Strong Interest Inventory Artistic dimensions than the results of this study. A low correlation with the Campbell Skill and Interest Inventory Adventuring dimension was also found in this study.

The True Colors™ Word Cluster Instrument Orange dimension resulted in a moderate statistically significant correlation with the Myers-Briggs Perceiving dimension. Lower than expected correlations were found with the Strong Interest Inventory Artistic dimension and the Campbell Interest and Skill Survey Adventuring dimension. Only partial support was found for Hypothesis 4. Note that the Word Cluster Instrument results for the Strong Interest Inventory's Artistic dimension found no association; however the Character Cards' Activity resulted in a moderate correlation. This would indicate that the Character Cards' Activity could be able to draw on a respondent's artistic tendencies more than the Word Cluster Instrument.

Limitations

Interpretation of results must be confined to the inherent limitations found in this study. The limitations of archival data and the use of a specialized sample consisting of

graduate students recruited from a particular program of study warrants caution when a generalization of the results are applied to a broader population.

Self-report instruments were the main means of gathering the data for this study. The use of any self-report instrument opens the possibility of individual response bias on the part of the participants. Experience in using personality and interest assessments has shown some individuals to have a stronger affinity to choosing responses most like what they would like to be or think they should be interested in, rather than the response most clearly representing their true personality or interests. However, response bias on the part of participants for performance tests can be effected from a lack of effort, as well.

Conclusions

The conclusions drawn in this section have been based on this study's results and previous results from research discussed in Chapter Two.

1. This study's results indicate support for the continued establishment of True Colors™ convergent validity with the Myers-Briggs Type Indicator through further research.

The True Colors™ Character Cards' Activity and Word Cluster Instrument correlations essentially mirror one anothers results with the Myers-Briggs. For example, the Blue dimensions of both the Cards and Word Cluster (.49 and .53) were essentially the same as correlated with the Feeling dimension. The Green dimensions of both were also very close to one another (-.42 and -.38) as correlated with the Thinking dimension. The correlations for both True Colors™ activities were significant in the predicted correlations and in the predicted direction of the hypotheses with the Myers-Briggs. The results also

had other dimensions that have produced significant positive and negative correlations between True Colors™ and the Myers-Briggs. Therefore, this study's results show encouragement for further studies concerning the convergent validity of True Colors™ and the Myers-Briggs study.

2. This study indicates little support for continued research to establish the convergent validity of True Colors™ with the Strong Interest Inventory or the Campbell Skill and Interest Inventory.

Correlations between True Colors™ Character Cards' Activity and Word Cluster Instrument with the Strong Interest Inventory and the Campbell Interest and Skill Survey found mixed results between the True Colors™ two activities and partial support of the hypotheses. Therefore, the partial degree of significant relationships between theses three measures adds little encouragement to continue further research to establish convergent validity of True Colors™ with interest inventories.

3. In this study, it can be concluded that for adults over the age of 24, age is a significant factor in specific dimensions from each instrument used in this study.

This study's results indicated that True Colors™ does have differences between age groups. The literature review also noted a developmental change in True Colors™ personality type from children age 9 to 12 and adults. This would suggest that True Colors™ personality types do change over time and may be effected by the participants' environments or experiences at the time of testing.

4. In this study, it can be concluded that gender does not effect the determination of True Colors™ personality types.

This study's results indicated True Colors™ is equivalent for men and women in its ability to determine personality type. This is a remarkable feature for True Colors™ when consideration is given to the amount of effort devoted to overcoming gender differences with the Myers-Briggs and Strong Interest Inventory. In this study, basic gender differences brought about by socialization had no effect on True Colors™ results; however, gender did prove to effect the Thinking - Feeling dimension from the Myers-Briggs Type Indicator. The Strong Interest Inventory resulted in gender differences on two dimensions: Realistic and Enterprising. Historically, males have scored higher than females on the Realistic, Enterprising, and Investigative dimensions which reflects the more traditional male-oriented occupations. Note, the fact that females averaged higher than males on the Enterprising dimension may contain an interesting connection to the recent trend for greater numbers of women starting small businesses.

Finally, the Campbell Skill and Interest Inventory gender differences were consistent with the results of the national norm group reported in the assessment's 1992 Manual. This study also found that females averaged statistically significantly higher than males on the Creating dimension and males averaged statistically significantly higher than females on the Adventuring dimension.

Implications

One of the purposes of this study was to provide practical value for the professionals using True Colors™ personality type training in the counseling, education, and business spheres. One major implication of this study is that True Colors™ has specific and significant relationships with another personality type assessment, the

Myers-Briggs Type Indicator. However, these relationships do not always follow the logical associations or assumptions a professional using True Colors™ might make. The findings of this study underscore the need for caution in extrapolating types across different personality assessments. This study has provided specific information on how True Colors™ relates to the Myers-Briggs Type Indicator.

This study provides specific information regarding the strength of the True Colors™ Character Cards' Activity and Word Cluster Instrument in regard to gender neutrality for the adults in this study. This study also provides practical application information for professionals using the True Colors™ Character Cards' Activity and Word Cluster Instrument in regard to the fact that the different tools have an appeal to specific personality types and illicit the participant's confidence differently. The Character Cards' Activity have an appeal to the Blue and Orange personalities and attracts more creative and artistic responses. The Word Cluster Instrument appeals to the Green and Gold personalities and attracts more analytical and organizing type of responses. An example of how to apply in a group training of True Colors ™ would be the use of the Character Cards' Activity with a group of Art students and the use of the Word Cluster Instrument with a group of Chemistry students in a limited presentation time frame.

Recommendations for Future Research

As discussed in previous sections of this chapter, statistical significance in support of the convergent validity of True Colors™ with the Myers-Briggs Type Indicator was found, but not for the Strong Interest Inventory and the Campbell Interest and Skill Survey. The following recommendations are made in a sincere effort to aid future research

examining True Colors™ convergent validity and, ultimately, predictive validity with the Myers-Briggs or other personality assessments.

Future research should be conducted with other diverse populations and nonrandomized samples in order to establish a more scientific representation of what constitutes a True Colors™ normal distribution for the four color personality types. The sample for this study was a normal distribution; however, it did not reflect the nonrandomized national distribution found by Lowry (1990).

Future research should be conducted to examine gender effects. A sample with fairly equal proportions of gender is suggested for future studies. Continued research is needed to determine if the results of this study concerning the lack of gender effects on True Colors™ results provided a correct representation of True Colors™ capabilities.

Future research should be conducted with the variables of race, ethnicity, and culture in order to ascertain how and if these variable effect the True Colors™ personality typing process. This focus of study would add research information that is comparative to the ethnic-related material available on the Myers-Briggs Type Indicator (Manual, 1998).

Future research should examine the question of age and if personality type does change over the developmental period from childhood to adulthood. As an example from Lowry's (1990) study, the number of Orange personality type, 9 to 12 years of age was considerably higher than adults, while Golds markedly increase in numbers by adulthood. Blue and Green personality types remain fairly constant over the same time frame. Thus, according to Lowry's (1990) data, changes in personality type from childhood to adulthood do occur; however, his data was not collected with scientific randomized

procedures or samples. Therefore, the data is not generalizable to the population.

Specific to True Colors™ dimensions as determined by the Word Cluster Instrument, refinement of the Word Cluster Instrument's descriptive words which were based on Keirsey (1978) is needed. This research should strengthen the True Colors™ intercorrelations and make the True Colors™ two methods' dimensions more distinct from one another.

Finally, future research is called for with True Colors™ regarding other specific suggestions on how to refine and raise the significance level of the intercorrelations between the Character Cards' activity and Word Cluster Instrument.

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Appendix A

COLORADO STATE UNIVERSITY
INFORMED CONSENT TO PARTICIPATE IN A RESEARCH PROJECT

TITLE OF PROJECT: Comparison of scores from True Colors™ and the MBTI, SII, CISS.

NAME OF PRINCIPAL INVESTIGATOR: Dr. Rich Feller 491-6879
NAME OF COINVESTIGATOR: Stevie Honaker 491-1955
SPONSOR OF PROJECT: N/A

PURPOSE OF THE RESEARCH: You will be asked over the course of a semester class To voluntarily take ten assessments, within nonstandard procedures in order to compare The relationship of the scores of various career-related assessment tools.
PROCEDURES/METHODS TO BE USED: You will be asked to respond to the four assessments, some outside of class, and to return your assessment scores at the next class for an interpretation of your results. This will not be video or audio taped in any way. You will be asked to sign a release so that the results may be used in this study.
All scores, names, and any identifying information will be kept completely anonymous.
RISKS INHERENT IN THE PROCEDURES: There are no known risks. It is not possible to identify all potential risks in an experimental procedure, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.
BENEFITS: Although there is no direct benefit other than the information about you that each assessment provides, your help in this research is greatly appreciated.
CONFIDENTIALITY: The principal investigator will identify all participants and their set of scores only by an assigned number.
LIABILITY: The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled. Your signature acknowledges that you have read the information stated and willingly sign this consent form. Your signature also acknowledges that you have received, on the date signed, a copy of this document containing _1_ page.

_____
Participant name (printed)

_____ _____
Participant signature Date

_____ _____
Investigator signature Date

Appendix B

COPYRIGHT PERMISSION LETTER

November 6, 2000

Dr. Stevie. Honaker, Ph.D.
2060 Stoney Hill Court
Fort Collins, CO 80525

Dear Dr. Honaker,

On behalf of True Colors™ Communications Group, I am honored to give you permission to copy two pages of True Colors™ product for your dissertation for your doctorate degree. The two pages we are referring to are: four, five and fourteen out of the TCP100 Don Lowry's True Colors™ Keys to Personal Success.

Best of luck with your future career plans and thank you for choosing True Colors™ as your key topic of research.

All the Best,

Kimberly Heflin, Training Director
True Colors™ Communications Group

CC: Don Lowry, Founder/CEO
Connie Jennings, Asst. Training Director

Appendix C

WORD CLUSTER INSTRUMENT INSTRUCTIONS

1. VISUALIZE YOURSELF

Remove your set of color-coded Character Cards from the middle section of this booklet. Review each of the illustrations, and arrange the cards from the one most like you to the one least like you.

2. READ ABOUT YOURSELF

Turn over the cards and read the back of each. Arrange again from the most like you to the least like you. Now, score them in the boxes to the right using a (4) for the most like you, (3) second, (2) third, and (1) for the one least like you.

3. DESCRIBE YOURSELF

In the section to the right are groups of words in rows. Reading from left to right, score each group of words giving yourself (4) for most like you, (3) second, (2) third, and (1) for least like you.

4. IDENTIFY YOUR TRUE COLORS

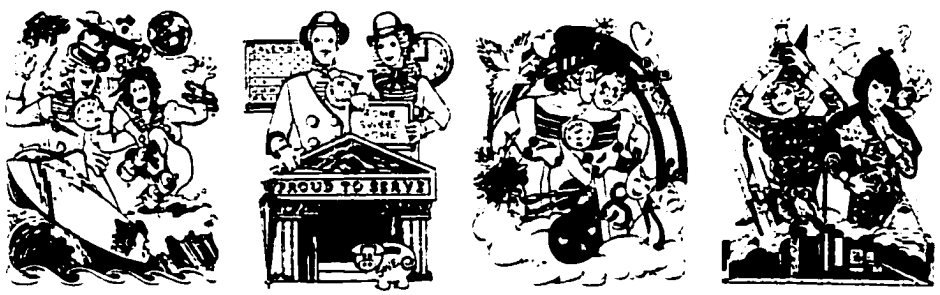
Now, total the columns, including your card points. Your highest score indicates your primary, or brightest, color; the lowest score represents the color least like you.

5. YOUR PERSONAL COLOR SPECTRUM

The following pages 6-13 further describe your personal characteristics. Continue reading the descriptions beginning with your brightest color to your most pale color, keyed to the pages to the right.

Appendix D

WORD CLUSTER INSTRUMENT



ACTIVE OPPORTUNISTIC SPONTANEOUS	PARENTAL TRADITIONAL RESPONSIBLE	AUTHENTIC HARMONIOUS COMPASSIONATE	VERSATILE INVENTIVE COMPETENT
COMPETITIVE IMPETUOUS IMPACTFUL	PRACTICAL SENSIBLE DEPENDABLE	UNIQUE EMPATHETIC COMMUNICATIVE	CURIOUS CONCEPTUAL KNOWLEDGEABLE
REALISTIC OPEN-MINDED ADVENTURESOME	LOYAL CONSERVATIVE ORGANIZED	DEVOTED WARM POETIC	THEORETICAL SEEKING INGENIOUS
DARING IMPULSIVE FUN	CONCERNED PROCEDURAL COOPERATIVE	TENDER INSPIRATIONAL DRAMATIC	DETERMINED COMPLEX COMPOSED
EXCITING COURAGEOUS SKILLFUL	ORDERLY CONVENTIONAL CARING	VIVACIOUS AFFECTIONATE SYMPATHETIC	PHILOSOPHICAL PRINCIPLED RATIONAL
TOTAL	TOTAL	TOTAL	TOTAL
ORANGE	**GOLD**	**BLUE**	**GREEN**
PAGE 6,7	PAGE 8,9	PAGE 10,11	PAGE 12,13

** Record your True Color spectrum on Page 14 **

Appendix E

TRUE COLOR SPECTRUM RESULTS VIA THE WORD CLUSTER INSTRUMENT

YOUR TRUE COLORS SPECTRUM

Now that you have sorted your Character Cards and discovered and read about yourself, have you identified your color spectrum?

Write your color spectrum below. If you are unable to do so at this point, try repeating the process for additional clarity. Or, you may wish to ask people who know you well just how they see you.

MY BRIGHTEST COLOR
(The Color Of Your Highest Total)

MY BRIGHTEST COLOR IS SHADED WITH
(The Color Of Your Second Highest Total)

AND
(The Color Of Your Second Lowest Total

WITH A PALE
(The Color Of Your Lowest Total

You now know your highest color, the one which most esteems you. The values of your shaded colors vary in importance and the values of your most pale color are least expressed in your behavior.

Play True Colors With Others

Keep your Character Cards to use with others and use your keys booklet to review their motivations. Everyone will have a natural interest in playing True Colors with you. Once you understand their True Colors spectrum, you can utilize the keys to improve communication and your personal and professional success.

As you become aware of how people respond, you will have a better understanding of yourself and of others.

Appendix F

Overall Means, Standard Deviations, Standard Error and Minimum and Maximum Level for the Myers-Briggs Type Indicator, Strong Interest Inventory, and Campbell Interest and Skill Survey

	Overall Means	S.D.	S.E.	Scores Minimum	Maximum
Myers-Briggs Type Indicator					
Extraversion	13.23	6.77	-.31	0	26
Introversion	11.80	6.35	.35	1	26
Sensing	12.91	10.06	1.39	0	53
Intuition	13.05	7.36	-.12	0	29
Thinking	11.23	8.23	1.10	1	41
Feeling	9.84	5.90	.25	0	25
Judging	12.88	7.32	.33	3	28
Perceiving	12.55	8.11	.52	0	37
Strong Interest Inventory					
Realistic	47.34	9.30	.50	33	66
Investigative	45.27	9.92	.23	30	65
Artistic	50.14	10.43	.06	29	69
Social	52.05	10.76	-.24	28	73
Enterprising	51.57	10.10	.19	33	73
Conventional	48.09	10.10	.49	28	72
Campbell Interest and Skill Survey					
Influencing	51.55	11.24	.12	25	86
Organizing	50.91	11.21	.02	28	75
Helping	52.84	11.04	-.13	33	72
Creating	51.29	10.01	.15	27	70
Analyzing	47.21	10.90	.30	30	69
Producing	51.36	10.66	.18	31	74
Adventuring	52.32	12.45	-.01	31	76

Note. Based on 56 participants.

Correlation Matrix for the True Colors™ Character Cards and Word Cluster Instrument, Myers-Briggs Type Indicator, Strong Interest Inventory, and the Campbell Interest & Skill Survey Dimensions

	True Colors Character Cards				True Colors Word Cluster Instr.				Myers-Briggs Type Indicator Dichotomous Dimensions							Strong Interest Inventory General Occupational Themes						Campbell Interest & Skill Survey Orientation Scales						
	Or	Go	Bl	Gr	Or	Go	Bl	Gr	E	I	S	N	T	F	J	P	R	I	A	S	E	C	I	O	H	C	A	P	A
Or	----	-.42	-.33	-.28	.62	-.34	-.22	-.03	.08	-.07	.12	-.08	-.05	.22	-.40	.37	-.13	-.28	-.32	-.19	.04	-.25	-.09	-.13	-.14	-.27	-.24	-.18	.08
Go		----	-.25	-.34	-.24	.63	-.10	-.43	-.31	.29	.34	-.42	.16	-.24	-.41	.45	.05	-.09	-.16	-.06	-.05	.10	-.05	-.02	.06	-.05	.00	.14	.16
Bl			----	-.36	-.34	-.11	.75	-.27	.52	-.41	-.38	.42	-.54	.49	-.10	.10	-.06	.08	.47	.51	.30	.24	.23	.11	.28	.42	-.10	-.14	-.16
Gr				----	-.09	-.19	-.38	.75	-.27	.17	-.11	.05	-.42	.48	.09	-.01	.13	.29	.06	-.24	-.31	-.10	-.10	.02	-.21	-.07	.32	.17	-.12
Or					----	-.52	-.40	-.08	.14	-.15	-.09	.15	.07	-.01	-.30	.32	.12	-.02	-.04	-.17	-.00	-.21	-.05	-.19	-.14	-.02	.02	.07	.09
Go						----	-.17	-.35	-.36	.35	.33	-.40	.09	-.08	-.46	.49	.06	.02	-.27	.01	.03	.29	.02	.28	.11	-.18	.08	.14	.12
Bl							----	-.35	.51	-.41	-.16	.21	-.55	.53	-.14	.09	-.02	-.08	.26	.41	.25	.09	.17	.00	.26	.28	-.23	-.30	-.12
Gr								----	-.22	.14	-.11	.10	-.38	.39	-.00	.11	.05	.10	.07	-.24	-.24	-.16	-.23	-.08	-.25	-.09	.09	.06	-.19
E									----	-.79	-.39	.43	-.50	.45	-.21	.26	-.14	-.06	.34	.42	.36	.00	.27	-.11	.21	.35	-.24	-.29	-.21
I										----	.48	-.49	.39	-.36	.34	-.20	.08	.06	-.28	-.39	-.35	-.00	-.21	.18	-.25	-.29	.25	.10	.07
S											----	-.85	.47	-.24	.25	-.12	.09	-.25	-.55	-.40	-.05	.07	-.32	.11	-.26	-.47	-.03	-.00	.04
N												----	-.32	.26	-.39	.37	-.03	.26	.55	.36	.10	-.10	.37	-.19	.26	.48	.02	.01	-.00
T													----	-.79	.23	-.11	.38	.07	-.26	-.47	-.24	.01	-.18	.01	-.35	-.32	.25	.28	.12
F														----	-.30	.21	-.16	-.02	.05	.43	.36	.15	.01	.02	.33	.10	-.18	-.18	.01
J															----	-.80	.14	.03	-.07	-.12	-.11	.28	-.00	.21	-.21	-.06	.16	-.03	.06
P																----	-.05	-.05	.15	.09	.03	-.25	.01	-.23	.17	.13	-.11	.04	-.14
R																	----	.52	.18	.02	.12	.40	.09	.36	-.09	.05	.58	.68	.25
I																		----	.25	.43	.11	.40	.35	.42	.34	.15	.84	.46	.17
A																			----	.40	.19	-.07	.38	-.05	.14	.87	.02	.25	-.24
S																				----	.60	.45	.56	.30	.83	.38	.18	.05	.09
E																					----	.39	.53	.40	.43	.17	-.06	.07	-.00
C																						----	.12	.55	.29	-.06	.40	.20	.08
I																							----	.35	.51	.46	.24	.16	.21
O																								----	.32	-.03	.54	.37	.13
H																									----	.26	.25	.10	.24
C																										----	.01	.26	-.14
A																											----	.52	.27
P																												----	.36
A																													----

Note. $|r| \geq 20$, $p \leq .05$