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Comparison of WAIS-R Subtest Scores in MBTI Sensing Types and Intuitive Types

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COMPARISON OF WAIS-R SUBTEST SCORES IN
MBTI SENSING TYPES AND INTUITIVE TYPES

by

Gary Mitchell Jaworski

A Thesis Submitted to the Faculty of the Graduate
School of Loyola University of Chicago in Partial
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VITA

The author, Gary M. Jaworski, was born on September 9, 1955 in Chicago, Illinois. He is the son of Virginia and the late Mitchell Jaworski.

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CHAPTER I

INTRODUCTION

The interface between particular cognitive and perceptual abilities and specific personality styles has been acknowledged by Wechsler (1981) who conceived of intelligence as a multifaceted and multidetermined function of the entire personality. A comprehensive review of the Wechsler Adult Intelligence Scale (WAIS) suggests that personality constructs may in fact effect differential mental abilities (Matarrazzo, 1972). Clinical practice and theory has long suggested a relationship between personality variables and cognitive styles (Rapaport, Gill, & Shafer, 1945; Shapiro, 1965). Recent reviews of the empirical literature on the relationship between personality factors and intellectual abilities have underated this as a research area. Reviews of the overlapping domains have suggested relatively scant though promising research results (Bernstein in Buros, 1972; Matarazzo, 1972).

Much of the empirical research conducted on the WAIS and personality measures has focused on predictions based on Gittengers Personality Assessment System (Matarazzo, 1972; Turner, Willerman & Horn, 1976; Winne, 1974). The Gittenger Personality Assessment System, (PAS), comprised the first extensive attempt to empirically investigate the relationship between the WAIS and personality constructs (Matarazzo, 1972). Also attracting a large number of studies have been research investigat-

ing WAIS-Minnesota Multiphasic Personality Inventory (MMPI) relationships, (Bloom & Entin, 1975; Holland & Watson, 1980; Turner & Horn, 1976). While the bulk of this work has led to only modest claims of relationship, at least one reviewer (Bernstein in Buros, 1972) suggests that investigations of the relationship between personality style and cognitive ability, as measured by the WAIS, is fertile ground for major inquiry, particularly when personality variables are defined with specificity.

The Myers-Briggs Type Indicator, MBTI, (Meyers, 1962) is another widely used personality inventory. However, unlike the MMPI, the MBTI is concerned less with psychopathology, and primarily concerned with variations in normal attitudes and behavior (McCaulley, 1981). Beginning in 1942 Isabel Myers considered questions for an instrument which would reliably indicate the Jungian category to which an individual belonged. In more recent years, extensive revising and norming for the 166 item MBTI has been accomplished by the Educational Testing Service (ETS), which published the test in 1962. In brief, the MBTI classifies people according to the bipolar dimension initially described by Jung: the two attitudes of introversion-extraversion, and the four functions of thinking-feeling, sensing-intuiting, as well as the dimension of judging-perceiving. While the introversion-extraversion scale as well as the thinking-feeling scale have been the subject of numerous studies, a lesser number of investigations have targeted on the judging-perceiving and the sensing-intuiting scales. It is the latter scale which is the focus of the present study.

Keirsey and Bates (1978) and Myers (1980) suggest that no dimension on the MBTI is as related to learning styles in both children and adults as the sensation-intuition dimension. Myers (1980) contends that the inability of a teacher to determine a child's perceptual and information processing style may have a damaging effect on the child's ability to learn. The present educational system tends to favor intuitive types, because of the speed with which intuitives are able to translate words into meanings. While sensing type students have higher school drop out rates than intuitives (Keirsey & Bates, 1978), Myers maintains that power tests, such as the Otis, fail to differentiate types by ability (Myers, 1980). Myers suggests that sensing type students do not differ from intuitives in terms of ability, but rather, are handicapped by test taking technique (1980).

The purpose of this study is twofold. First, while construct validity studies on the MBTI have often been directed toward suitability of particular personality types to career choice, mate selection, and personality constructs derived from other personality inventories, a lesser number have focused on educational or learning variables (Myers, 1962). Examination of the MBTI's sensation-intuition dimension and selected WAIS-R subtests will contribute to the MBTI's capacity to differentiate particular cognitive abilities. This has relevance with regards to the potential the MBTI has in yielding information about early learning and perceptual styles. Potential uses for the MBTI include its capacity to provide greater information in the area of learning delays in young individuals as well as provide educators with

information on the differing perceptual styles of their students. Secondly, this study will contribute to further empirical investigation of the already broadly used MBTI (McCaulley, 1981). This is significant in that the Jungian community that mainly employs this measure is frequently doing so from a clinical rather than empirical basis.

CHAPTER II

REVIEW OF THE LITERATURE

Theory of Personality Differences: Jung's Typology

Jung's early attempts to classify individuals by personality typology was conceived in terms of the individual's biological adaptation to the world of objects. Jung viewed each type to have "peculiarities" which are reflected in the most differentiated function by which the individual "adapts and orients himself" (1971). Hall and Lindsey (1970) suggest that Carl Jung's voluminous writings on human personality have had incalculable influence not only to psychologists but to educated people in various fields. For Jung, the total personality or psyche is comprised of several differentiated and interacting systems. The major components in the Jungian system include the ego, the persona, the anima and amimus, the shadow, the personal unconscious and its complexes, the collective unconscious and its archetypes, and the self or the center of personality. Along with these differing components are the attitudes of introversion and extraversion and the functions of feeling, thinking, intuiting and sensing. The attitudes and functions comprise Jungian typology.

Jung's (1921) primary focus in his early description of psychological types concerned the attitudes of introversion and extraversion. In the extraverted attitude (E), psychic energy flows outward to objects

and people in the environment. In the introverted attitude (I), psychic energy moves from the object back to the subject, who retains the energy by incorporating it to the inner world of thought and concepts.

Jung's (1921) orienting functions, thinking (T), feeling (F), sensing (S), and intuiting (N), represent the individual's orientation to consciousness. The thinking-feeling functions (T-F) are considered the rational functions and represent distinct ways of judging. The thinking function employs the use of conceptualization and logical connection to form the basis of judgments. The feeling function evaluates subjective material by the ordering of values.

Within Jung's system, sensation and intuition are termed the irrational functions and refer to two distinct, stylistic ways of perceiving. Sensation refers to perceptions which are the direct result of stimulation of the bodily sense organs. Sensation allows one to establish external existences. Intuition refers to perception by way of insight. Jung considered intuition to be perception by way of the unconscious, with a focus on the hidden possibilities, meanings, and relationships between what is perceived.

A final preference implied by Jung and made explicit by Myers (1962) is the judgment-perception dimension (J-P). This preference refers to the individual's dominant extraverted function of judging, (thinking or feeling) or perceiving, (sensation or intuition). Judging types prefer living in a planned, decisive, and orderly way, whereas perceiving types prefer adapting in a spontaneous and flexible manner to the environment. (See Appendix A for a summary of the four prefer-

ences).

A closer inspection of the concepts of sensation-intuition has led to problems with the conceptualization and differentiation of these concepts. Jung (1921) notes the word usage problem in the common parlance: "This must be expressly established beforehand because if I ask an intuitive how he orients himself he will speak of things that are almost indistinguishable from sense impressions. Very often he will use the word 'sensation.'" (p.367).

Jung's psychophysical equation, which likens sensation as proportionate to the intensity of the physical stimulus, and postulates that intuition is a type of unconscious, instinctive apprehension underscores his position that sensation and intuition are indeed opposing functions. Contemporary Jungian writers follow Jung's basic distinction.

Von Franz (1979) in an analysis of the irrational types contends that the sensing type is an expert at noticing details. Intuitives, on the other hand, tend to view things vaguely or from afar, not looking at the facts too closely, in order to get the unconscious hunch. Von Franz maintains that it is for this very reason that intuitives, contrary to sensing types, tend to be regarded as unpunctual and vague.

Keirsey and Bates (1978) use the following words to describe sensing types: "experience, past, realistic, perspiration, actual, down-to-earth, utility, fact, practicability, sensible" (p.25). This is contrasted with the words they use to describe the intuitive type, "hunches, future, speculation, inspiration, possible, head-in-the-clouds, fantasy, fiction, and imaginative" (p.25).

Keirsey and Bates (1978) suggest that the S-N distinction involves more than the semantic distinction delineated by Jung. They maintain that it is the S-N distinction that has the largest influence on children's particular learning styles. That is, teaching a child by means of a method conflicting with their innate perceptual apparatus can deleteriously effect learning. They suggest that this is one of the reasons that the S-F combinations, who tend to do have difficulties in reading and analyzing material, have such a high drop out rate in school (Keirsey & Bates, 1978).

In the following section the attempt to operationalize not only the S-N dimension, but Jung's complete typology will be examined.

Extensions and Applications of Jung's Theory: The MBTI

Empirical support for Jung's categorization of psychological type has been supplied primarily through the work of Katherine Briggs and her daughter, Isabel Myers (Myers, 1962;1976;1980). Beginning in 1942, Myers considered questions for an instrument that would reliably indicate the Jungian category to which an individual belonged. In recent years more extensive revising and norming of the 166 self report Myers-Briggs Type Indicator (MBTI) has been accomplished by the Educational Testing Service which published the test in 1962.

In essence, the MBTI classifies individuals according to the categories originally described by Jung: the bipolar dimensions of introversion-extraversion (I-E), thinking-feeling, (T-F), and sensation-intuition, (S-N). In addition, Myers added a fourth dimension, judging-perceiving, (J-P), which was a direct outgrowth of her empirical

investigations. Within the forced choice format of the instrument individuals are classified according to their higher score on each dimension, with the zero point theoretically separating types. The score ranges are E58-0-I59, S67-0-N51, T49-0-F51 (males), T61-0-F49 (females), J55-0-P61, (Myers, 1962). That is, for example, the highest possible extraversion score is (E)53, the lowest is one, the highest possible introversion score is (I)59, the lowest is one. Any preference score less than 20 is considered indicative of an individual who has a less differentiated type and who holds characteristics of both types on the given bipolar dimension. In sum, the MBTI offers 16 possible personality combinations.

Recent investigations of the indicators construct validity have centered on specific educational variables and their relationship to MBTI scales. Nichols and Holland (1963) studied non-intellective factors found on the MBTI and other personality inventories and related them to academic achievement of National Merit Finalists. They found intuition and feeling types to be related to originality and artistic interests in college, perception to be negatively correlated with conformity and socialization, and judgment to be positively correlated with conformity and socialization, and judgment to be positively correlated with higher grades even in this academically homogeneous group.

Myers (1980) in an analysis of 71 Rhodes Scholars found that as a group they had even a higher percentage of intuitives than National Merit finalists, which comprised of 83% intuitives. The majority of Rhodes Scholars were also feeling types, reflecting the humanistic cri-

terion of the award.

Sundberg (1965) in his review of Educational Testing Services reports, notes that intuition and to a lesser extent, introversion, have low but significant positive relationships to measures of intelligence and school achievement. Also, within similar aptitude levels, judging types were found to achieve higher grades.

The Educational Testing Service (ETS) studied 15,000 high school and college students in an attempt to find what aptitude and grades can tell about types (Myers, 1962). For 3,503 college preparatory boys, the ETS found that the mean advantage of intuitives on IQ is about seven points over sensing types. Introverts and perceptives were found to have a two point advantage over extraverts and judges respectively. The thinking advantage in this study was one IQ point over feeling. By moving away from the zero point, towards the extremes on each scale, the ETS found that regression of IQ and vocabulary on the sensation-intuition dimension showed the greatest differences. That is, as the intuition score became more extreme the higher the rise in IQ and vocabulary. As the sensing score became more extreme, the lower the drop in IQ and vocabulary (Myers, 1962). However, Myers (1980) analysis of the same data led her to the conclusion that it is not differences in ability, but rather in test taking techniques that handicaps sensing type students.

Slocum and Kerin (1981) in a study of MBTI scales and memory found that thinking types requested more quantitative information than did feeling types. Carlson (1980) in a similar investigation found differ-

ences on the E-I, T-F, S-N scales in memory and social perception, and questioned the assumption that subject variables can be ignored in the research of cognitive processes. She recommends Jungian type theory as a means to bridge the nomothetic and idiographic modes of inquiry by providing information on the personal ways individuals represent their interpersonal worlds.

Personality Dynamics & Cognitive Styles: WAIS-R studies

Wechsler (1981) in his introductory remarks in the WAIS-R manual argues that intelligence is both multifacted and multidetermined extending beyond the mentalistic and intellectual components to include the whole person. "Intelligence is a function of the personality as a whole, and is responsive to other factors besides those included under the concept of cognitive abilities" (Wechsler, p.8).

Matarazzo's (1972) comprehensive review of the WAIS suggests that personality constructs may in fact effect differential abilities. He suggests that clinicians have long used WAIS intersubtest and intrasubtest scatter to profile unique patterns of psychiatric conditions. Matarazzo cites Gittenger's Personality Assessment System, as an empirically sound example of utilizing ability (WAIS) subtest scores to differentiate personality components: the Externalizer-Internalizer dimension, the Role adaptive-Role uniform dimension, and the Regulated-Flexible dimension (Turner, Willerman, & Horn, 1976; Winne, 1974). The latter dimension is conceptually similar to the MBTI sensation-intuition (S-N) dimension in that both dimensions refer to a component of the individual's personality that is indicative of the individual's learning

or processing style (Myers, 1980).

Bernstein (in Buros, 1972) in another review, emphasizes the importance of relating the construct of intelligence to general personality theory. Bernstein further notes that the more specified the personality variable, the more promising the research results on the WAIS-R. For example, Bernstein notes that in addition to the Personality System (PAS), anxiety, risk taking behavior, impulsivity, and future orientation have all been explored as relating to WAIS-R measures (1972).

Another personality dimension investigated in light of WAIS subtest performance was that of Corteria and Temperamental Independence (Turner, Willerman, & Horn, 1976). Corteria was defined as cortical alertness, characterized by cheerfulness, and alertness to handle problems at the cognitive, rather than affective level. Temperamental Independence, of which field independence is included as a perceptual set, includes a general criticalness, low rigidity, self control, and self assurance. For the sample of 122 men and 127 women, Turner, Willerman, and Horn (1976) found that Temperamental Independence is related more strongly than Corteria to performance on certain WAIS verbal tests as well as to Verbal IQ and Full Scale IQ. The highest correlation for Temperamental Independence was for the Comprehension, Information, and Vocabulary subtests while the highest correlation for Corteria was with Arithmetic and Picture Completion. Both Corteria and Temperamental Independence were significantly related to WAIS scores for men. Temperamental Independence, but not Corteria were significantly correlated

with WAIS scores for women (Turner, Willerman, & Horn, 1976).

The MMPI represents the most popular and extensively researched personality inventory available today. Investigations of MMPI correlates of WAIS subtest performance have followed Wechsler's reasoning that intelligence must be regarded as part of the whole personality (Wechsler, 1981). Turner and Horn's (1976) factor analysis of MMPI and WAIS profiles yielded factors of academic competence, interpersonal warmth, and social competence for males, and conversational poise, competence, rejection of traditional religiosity and good health for females. Turner and Horn (1976) concluded that personality for males and females as defined by MMPI item response is most related to Verbal abilities and only inconsistently to Performance abilities. Contrary evidence on WAIS-MMPI relationships was provided by Bloom and Entin (1975), who found no significant relationship between the two scales.

However, Holland and Watson's (1980) multivariate analysis of WAIS and MMPI relationships among patients diagnosed as schizophrenic, brain damaged, neurotic, or alcoholic led to their conclusion that personality and intelligence belong to overlapping domains than contain both shared and unique components of variance. Holland and Watson argue that meaningful relationships between personality and performance on mental tests may be obscured by simplistic quantitative analysis and that further clarification of the relationship may be gained from a multivariate approach.

Use of WAIS-R and WISC-R subscales to elicit not only personality but also diagnostic information regarding psychopathology has an ongoing

precedent among clinical practitioners, (Kaufman, 1979; Rapaport, et al. 1945; Zimmerman & Woo-Sam, 1973). Kaufman's (1979) empirical analysis of the WISC-R provides a cogent argument relating particular subtests to cognitive/personality factors. Kaufman (1979) provides clinical support to his empirical investigations through the approach of analyzing subtest profiles in terms of the underlying abilities tested.

The four subscales of the WAIS-R used in this study, (Similarities, Comprehension, Digit Span, and Coding), all contain clinically interpretive diagnostic information. Empirical investigations of WAIS scales have suggested diagnostic utility (Beck, Feshbach, & Legg, 1962; Hodges & Durham, 1972; Miller, Fischer, & Dingman, 1961). In an investigation of the Digit Symbol degree of psychopathology, Beck, Feshbach, and Legg (1962) found decrements in Digit Symbol scores with increasing severity of illness. In addition, Digit Symbol was used to discriminate between neurotic and psychotic groups, with the former performing substantially worse on Digit Symbol than the latter. Hodges and Durham (1972) made use of performance on the Digit Span subtest to compare bright, low trait anxiety students with dull, low trait anxiety students. They concluded that when given a task of little relevance, (Digit Span) bright, low trait anxiety students would not apply themselves to the task. Conversely, the dull low trait anxiety students perform effortfully and thereby develop compensatory coping strategies (Hodges & Durham, 1972). More generally, Miller, Fischer, and Dingham (1961) in a study of the differential utility of WAIS Verbal and Performance IQ's found that Verbal IQ plays a vital role in release from

hospitals and adjustment in the community for psychiatric patients.

For Kaufman, a salient dichotomy on the Verbal subtests is that of Reasoning vs. Recall. Kaufman relates these cognitive processes to Thorndike's original distinction between the higher abilities of relational thinking and abstraction as opposed to more primitive associational abilities. Similarities and Comprehension involve Reasoning whereas Digit Span involves recall. Kaufman (1979) elaborates on this theme by suggesting that both Similarities and Comprehension involve verbal reasoning. Zimmerman and Woo Sam (1973) concur with this attribute of the two subtests in their analysis of WAIS Similarities and Comprehension. More specifically, Kaufman claims that Similarities involves reasoning abilities in tasks that are not inherently meaningful, whereas Comprehension requires practical and meaningful skill as applied to everyday situations (Kaufman, 1979).

Kaufman (1979) makes a secondary distinction between the subtests by noting that Similarities and Comprehension require a good deal of expression, in contrast to Digit Span and Coding which require little or no expression.

With regard to this investigation of the MBTI sensation-intuition construct, it is postulated that intuitive's proclivity to employ abstraction and verbal reasoning to a greater extent than sensing types, (Keirsey & Bates, 1978; Myers, 1962,1980), will result in better performance by intuitives on the Similarities and Comprehension subtests. Conversely, because of the sensing types greater capacity to attend to details, as well as be less distractable than the intuitive type (Keir-

sey & Bates, 1978; Myers, 1962,1980) it is postulated that sensing types will perform better on both Digit Span and Coding than intuitives. Implicit in Kaufman's (1979) distinction between Reasoning vs. Recall that Similarities is most "representative" of a Reasoning task and Digit Span is most "representative" of a Recall task. It is thus postulated that intuitives will perform best on Similarities, sensing types will perform best on Digit Span.

The MBTI and the WAIS-R: Summary and Hypotheses

The focus of this study is to examine the sensation-intuition construct of the MBTI in relationship to differential cognitive aptitudes as measured by the WAIS-R. Anastasi (1982) has suggested that a test's construct validity is determined by the test's capacity to measure a theoretical trait or construct. The focus is thus on the role that psychological theory plays in test construction. Anastasi (1982) has further stressed the importance of data, over and above logic and rationalization, in the process of test validation. Because construct validity implies a lack of operational definition in the construct, it may result in original ways of collecting validity data.

The current study employs the notion that personality constructs may effect differential mental abilities (Matarrazo, 1972). Shapiro's (1965) thorough and elegant delineation of the relationship between major neurotic styles and origin, development, and particularly individual defensive patterns with their inherent cognitive basis, lends clinical corroboration to the personality variable and cognitive style relationship. Rapaport, et al. (1945) have likewise investigated this

relationship employing the WAIS, not only as a measure of cognitive capacity, but also as a diagnostic tool within the broad framework of psychodynamic taxonomy.

Although the overall picture has yielded a relatively small number of empirical investigations on the cognitive style/personality variable interaction, some research has been performed with both the MBTI and the WAIS-R. Myers (1962) provided correlations between the MBTI and grade point average, SAT, and IQ scores. Carlson and Levy's (1973) study of short term memory, suggested that introversion-thinking (I-T) types perform better than extraversion-feeling (E-F) types on memory for digits and E-F's perform better than I-T's on memory for faces. Carlson (1980) in an examination of cognitive clarity and vividness of feeling found that E-F subjects reported memories more vividly than I-T subjects. Carlson thus reasoned that Jung's typology provides a useful way to understand the individual's representational styles of their interpersonal world.

Some of the WAIS-R studies which have explored cognitive components in relation to personality variables have been reviewed. Two major relevant research areas have included study of the relationship between WAIS-R subtests and the MMPI scales, as well as tests of Gittenger's Personality Assessment System using the WAIS. Burnstein (in Buros, 1972) suggests that while the WAIS-R has been researched primarily in terms of sociocultural variables and performance in areas outside the school environment, there is a need to relate the concept of intelligence to general personality theory. Burnstein further suggests

that in general the more specified the personality variable the more encouraging the results. Wechsler (1981) in reviewing research attempting to explain WAIS-R test variance notes that a large percentage of the test variance is not accounted for by solely intellectual factors. Wechsler argues that this suggests the influence of personality traits and other non-intellective components such as persistence and goal awareness in the more inclusive picture of intelligence.

The comprehensiveness of Jung's typology has provided working testable hypotheses. In this study, the focus will center upon the sensation-intuition dimension of the MBTI and its relationship to measures of verbal abstraction and comprehension, (WAIS-R subtests, Similarities and Comprehension), as well as measures of attentiveness, or "Freedom from Distractability", (WAIS-R subtests, Coding, and Digit Span).

The variable to be manipulated across and within levels of the WAIS-R Similarities, Comprehension, Coding, and Digit Span subtest scores is the MBTI sensation-intuition dimension.

Hypothesis testing will center on the identification of differential aptitudes between the sensation-intuition dimension. Intuitives are predicted to have greater ability on the measures of verbal abstraction and comprehension (WAIS-R subtests, Similarities and Comprehension), while sensing types are paradoxically predicted to have greater attentiveness and be freer from distractability (yielding higher WAIS-R Coding and Digit Span subtest scores). This comprises the major differences between groups predicted. The strongest individual subtest prediction proposed between groups are intuitives performing better on Sim-

ilarities than sensing types, and sensing types performing better on Digit Span than intuitive types. Between group differences for individual subtests are also predicted for Coding (sensing types higher) and for Comprehension (intuitive types higher).

With regards to within group differences, intuitives are predicted to score higher on Similarities and Comprehension than than they do on Digit Span and Coding. The reverse relationship is expected for sensing types. Intuitive types are also expected to perform best on Similarities, followed by Comprehension, Coding, and Digit Span, with the opposite order of scoring predicted for sensing types. Lastly, the stronger the preference for intuition-sensation, the stronger the expected differences predicted. Thus, the focus of this study is the construct validity of the sensation-intuition scale.

CHAPTER III

METHOD

Subjects

The subjects were 93 students from the Loyola University Subject Pool who volunteered for the experiment and received course credit in exchange for participation. There were 27 males (29%) and 66 females (71%). The ages ranged from 17 years 10 months to 48 years 11 months. However, the vast majority of subjects (87%) fell in the age range typical of an undergraduate population, (18 to 21 years of age). Subjects were from racially and culturally diverse backgrounds, and were predominantly from the middle socioeconomic class. A total of six subjects were excluded from the original sample due to incomplete, and thereby unscorable, Myers-Briggs Type Indicators (MBTI) or Wechsler Adult Intelligence Scale-Revised (WAIS-R) subtests. Among those subjects answering an optional question regarding future career aspirations, a large proportion indicated a preference for professional careers, with medicine as the most popular choice.

Instrument

The MBTI: Psychometric Properties As an instrument, the MBTI (Meyers, 1962) has garnered increasing support among clinicians and researchers alike, who both employ the rich taxonomic system. Reliability checks indicate correlations ranging from .73 to .87, with the

exception being males on the thinking-feeling scale (T-F) with $r=.56$ (Carskadon, 1977). Other reliability data (Carlyn, 1977; McCaulley, 1981; Myers, 1962) suggest that reliabilities of the MBTI are similar to other self report inventories, with the T-F scale appearing the least stable. Still to be investigated in the empirical literature is the extent to which an individual's mood during testing effects the T-F scale.

Validity studies of the MBTI have focused on how well the instrument measures the theoretical constructs described by Jung. Evidence for content validity was obtained in a study by Bradway (1964) in which 28 Jungian analysts classified themselves according to the extraversion-introversion (E-I), sensation-intuition (S-N), and thinking-feeling (T-F) type categories, with comparisons made with MBTI typing. Results showed 43% agreement on all three dimensions, 61% agreement on T-F classification, 68% agreement on S-N classification, and 100% agreement on E-I classification. Predictive validity was investigated by Goldschmid (1967) who also derived regression equations to predict college major in two samples of undergraduates, and found that the MBTI had moderate predictive validity. Stricker, Shiffman, and Ross (1965), studying three samples of entering college freshman concluded that the MBTI had some ability to predict dropout and grade point average, but that this varied with the nature of the sample. One study of individual MBTI scales, note the intuitive scales positive correlations with the PRI Liking to Think Scale, its positive loadings on intellectuality factor, and its positive correlations with a number of ability tests and its loadings on

an ability measure measure (Stricker & Ross, 1964).

Construct validity of the MBTI has been investigated by comparing MBTI scores with scores on other personality inventories. Carlyn (1977), in a review of several studies, suggests that the results of the evidence gathered is quite consistent with Jungian theory. Moreover, several factor analytic studies have shown substantial loadings on different factors, supporting Myers' premise of a four-dimensional structures of personality (Carlyn, 1977). (See Appendix B for the items comprising the MBTI sensation-intuition scale).

WAIS-R: Historical Review Wechsler generally defined intelligence tests as such, "Intelligence tests are psychometric devices, sets of standardized questions and tasks for assessing an individual's potential for purposeful and useful behavior (Wechsler, 1981, p.7). Wechsler's intelligence scales are organized into subtests with an increasing order of difficulty within the subtests. Separate Verbal and Performance subtests comprise separate Verbal and Performance IQ's (Anatasi, 1982).

The original Wechsler scale, known as the Wechsler-Bellevue Intelligence Scale was published in 1939; and was intended as an intelligence test to be used for adults. Prior intelligence tests lacked face validity for adults, as their composition was designed mainly for school aged children. Similar to the form and content of the Wechsler-Bellevue, the Wechsler Adult Intelligence Scale (WAIS) was published in 1955. The latest edition, the WAIS-Revised was subsequently published in 1981, (Anatasi, 1982).

Subtests: The WAIS-R is comprised of 11 subtests, six subtests

make up the Verbal Scale, five subtests comprise the Performance Scale. Of the subtests used in this study, three, Digit Span, Comprehension, and Similarities are Verbal subtests while Digit symbol is a Performance subtest. Digit Span is an orally presented subtest in which three to nine digits are orally reproduced. In the second part of the test, two to eight digits are to be reproduced backwards. Digit Span is considered the least reliable of the WAIS-R subtests, although it has been subjected to more studies than any other WAIS-R subtest. Digit Span is sensitive to a less than ideal testing situation. It is considered to measure the areas of attention and concentration. Comprehension consists of 16 items, and requires that the examinee explain why certain practices are followed, the meaning of proverbs, and what should be done in certain circumstances. Comprehension is designed to measure common-sense and practical judgment and clinicians often associate high scores with the capacity to check impulsive behavior and social competency and low scores with psychiatric disorders. The ability to think ahead is also measured by Comprehension. Similarities consists of 14 items and requires the examinee to say how two things are alike. Memory, comprehension, and associative thinking are measured by Similarities. Clinicians associate high scores with precision of judgment, emotional control, and psychological mindedness which are often related to academic success. Meticulousness, sophistication, and/or ostentation are character trends associated with high scores in some individuals. Digit Symbol is a code substitution, nonlanguage subtest which consists of nine symbols to be paired with nine digits. With the Key in front of him,

the examinee has 90 seconds to fill in as many symbols as possible under the numbers on the answer sheet. Clinicians have noted that alert or creative individuals may perform worse on Digit Symbol as a result of lower motivation than those with a compulsive need for conformity. Because of the speed and vigor are temporarily needed for Digit Symbol, a high score may indicate clerical skills, (Zimmerman & Woo-Sam, 1973; Anastasi, 1982).

Short Forms: Primarily for research purposes as well as for rapid screening devices, a large number of short forms of the WAIS-R have been proposed (Satz & Mogel, 1962; Vincent, 1979; Wildman & Wildman, 1977; Wolfson & Bachelis, 1960; Ziegler & Doran, 1979). One reviewer (Hafner, 1979), suggests that a good rule of thumb in choosing a short form is to choose subtests than answer specific questions that the examiner has in mind. While particular combinations of subtests may correlate $r=.90$ with Full Scale IQs (Matarazzo, 1972), the four subtests specifically chosen to test hypothesis of differential abilities between sensing and intuitive types do not correlate well enough with total score to reliably estimate Full Scale IQ. Thus, in the present study, the investigator does not extrapolate beyond individual subtest scale scores in the analysis.

Psychometric Properties The WAIS-R standardization sample was designed to include only "normal adults" and consisted of 1,880 cases with an equal number of of men and women distributed over nine age levels from 16 to 17 and 70 to 74 years. Participants were chosen to match the 1970 U.S. Census with regard to geographical region, urban-rural

residence, race, occupational level, and education (Anastasi, 1982).

Raw scores on the WAIS-R are transformed into standard scores with a mean of 10 and standard deviation of 3. Through use of the appropriate tables in the manual scaled scores are used to determine Verbal, Performance, and Full Scale IQ's with a mean of 100 and a standard deviation of 15. IQ's are found with reference to a person's particular age group (Wechsler, 1981; Anastasi, 1982).

Reliability coefficients for all 11 subtests, as well as Verbal, Performance and Full Scale IQ's have been computed for each of the nine age groups. Reliabilities for Full Scale IQ ranged from .96 to .98, from .95 to .97 for Verbal IQ, from .88 to .94 for Performance IQ. Lower reliabilities for individual subtests ranged from .52 for Object Assembly at age 16-17 to .96 for Vocabulary for six of the age levels. Only 5 of 89 coefficients fell below .70 for the 11 subtests (Anastasi, 1982).

Standard error of measurement for the three IQ's varied between 2.50 and 3.30 for Verbal IQ, from 3.69 to 5.18 for Performance IQ, and below 3 for Full Scale IQ (Wechsler, 1981). Stability coefficients for the WAIS-R were computed based on two administrations of the WAIS-R given over an interval of two to seven weeks to each of two groups--71 individuals in the 25-34 year group and 48 individuals in the 45-54 year group. For individual subtests stability coefficients were mainly in the .80 and .90's, with none below .67 for both groups. Also, for both groups, stability coefficients for Verbal, Performance, and Full Scale IQ's were in the .90's (Anastasi, 1982).

Regarding WAIS-R validity, Wechsler has noted, "The validity of any test refers to the extent to which it measures whatever we intend it to assess. A body of evidence, both rational and empirical, attests to the validity of the Wechsler Adult Intelligence Scale as a measure of global intelligence (Wechsler, 1981).

Criterion related validity studies have included industrial executives and psychiatric residents. In these groups, Verbal IQ correlated in the .30's with performance ratings. A number of studies involving WAIS school performance indicate the correlation is about .50. WAIS IQ's have also proved to be good predictors of institutional work release and later work adjustment, (Anastasi, 1982). Summaries of criterion related studies have been summarized by Matarazzo (1972) and Zimmerman and Woo-Sam (1973).

Construct validity of the WAIS-R has resulted from intercorrelation of the 11 subtests and of Verbal and Performance scale scores. Averaged across the age groups the Verbal and Performance scale correlated .74. Average correlation for the Verbal subtests ranged from .46 to .81, from .38 to .63 for Performance subtests, and from .33 to .56 between Verbal and Performance subtests. Individual subtest correlations as well as Verbal and Performance scale score correlations indicate that the two scales have a commonality and that allocation of subtests to either scale may be partially arbitrary (Anastasi, 1982).

Factor analytic studies of the WAIS have yielded a general single factor which accounts for about 50% of the variance in the battery. In addition, three major group factors were named: Verbal Comprehension,

Perceptual Organization, and Memory (Cohen, 1957). Verbal Comprehension has large weights on the Vocabulary, Information, Comprehension, and Similarities subtests. Perceptual Organization has substantial weights on the Block Design, and Object Assembly subtests. Lastly, Memory has weights on the Arithmetic and Digit Span subtests and entails immediate memory for novel material as well as recall of material learned previously (Anastasi, 1982).

Procedure

The data was collected during a six week period by three trained undergraduate volunteers. The investigator met with the volunteers prior to the experiment to familiarize them with the study and instruments and to insure uniformity of procedure. Because the WAIS-R subtests were administered in a group format, some deviations from individual administration were necessary. (See Appendix C for the uniform instructions given by each administrator).

The subjects were given the WAIS-R subtests first with the following introduction, seen in Appendix D, read beforehand. The MBTI (Form F) was administered next.

Finally the investigator along with the assistants who administered the tests, scored the WAIS-R subtests and MBTI according to the guidelines in the respective manuals. Finally the investigator determined scaled scores for each WAIS-R subtest.

CHAPTER IV

RESULTS

In order to determine the relationship between the Myers-Briggs Type Indicator (MBTI) sensation and intuition group membership and overall performance in the four WAIS-R subtests; Similarities, Comprehension, Digit Span, and Digit Symbol, a t test was performed. A significant difference was found between the two groups, $t(91) = -2.90$, $p < .01$, when the 4 subtests were summed. The intuitives scored 4 scaled score points higher than the sensing types as seen by the following means, for intuitives, $M = 49.1$ and for sensing types, $M = 45.1$. This finding is supportive of earlier evidence suggesting intuitives greater ability in test taking situations (Myers, 1962;1980). A one way analysis of variance comparing subtests means indicated that intuitives scored higher on each subtest, with the mean difference for Comprehension reaching statistical significance, $F(1,91) = -3.55$, $p < .01$. The reader is referred to Table 1 for specific information regarding means and standard deviations and F values.

To test the hypothesis that intuitives would perform better on tests of verbal abstraction and comprehension and that sensing types would score higher on measures of attentiveness or Freedom from Distractability, the Similarities and Comprehension subtest scores were summed as were the Digit Span and Digit Symbol subtest scores for each

TABLE 1

Means and SD's for MBTI Groups of WAIS-R Subtests

	<u>MEAN</u>	<u>SD</u>	<u>F</u> value
<u>Similarities</u>			
Sensation	8.74	2.37	1.21
Intuitives	9.36	2.16	
<u>Comprehension</u>			
Sensation	10.85	3.02	1.76 **
Intuitives	12.90	2.28	
<u>Digit Span</u>			
Sensation	13.35	3.04	1.56
Intuitives	14.23	2.43	
<u>Digit Symbol</u>			
Sensation	12.13	3.60	1.22
Intuitives	12.61	3.26	

**p<.01

group. A one way analysis of variance on the sum of Similarities and Comprehension and type reached significance, $F(1,91) = -3.01, p < .01$, with intuitives outperforming sensing types on the sum of these two subtests: $M=22.3$ for Intuitives and for Sensation types $M=19.6$. A one way analysis of variance on the sum of Digit Span and Digit Symbol and type, failed to reach statistical significance, $F(1,91) = 1.80, p < .22$. Group means for the sum of these two subtests showed a marked similarity ($M = 26.8$) for intuitives, and ($M = 25.5$) for sensing types.

In order to assay the interaction between the MBTI type and the sum of Similarities and Comprehension as well as the sum of Digit Span and Digit Symbol, a two way ANOVA with MBTI type as the between group variable and the sum of Similarities and Comprehension as one repeated measure, and the sum of Digit Span and Digit Symbol as the other repeated measure was performed. A BMDP Statistical Software program was employed to evaluate the interaction. This index of differences in the scoring pattern between intuitives and sensing types failed to attain statistical significance, $F(1,91) = .85, p < .37$, thereby indicating a lack of a group by measures interaction. However, there was again a main effect for type, $F(1,91) = 8.47, p < .01$, with intuitives outperforming sensing types on the four subtests.

To determine the extent to which the earlier finding that intuitives performed better on 4 subtests, evincing higher overall ability, effected performance on each subtest, an ANOVA on each subtest was performed with the overall ability measure, the sum of the 4 subtests as a covariate. The subject variables of race, age and sex were also cont-

rolled as covariates. The reader is referred to Table 2, and to Table 3, and to Table 4. for specific information on means and standard deviations of the subject variables.

An ANOVA of the Similarities subtest by type with race, age, sex, and overall ability on covariates failed to yield a significant main effect for type, $F(1,87) = .102, p < .76$. However, an ANOVA of the Comprehension subtest by type with race, age, sex, and overall ability as covariates reached significance, $F(1,87) = 5.25, p < .05$, indicating a main effect for type in which intuitives, as predicted, scored significantly higher than sensing types. The ANOVA of Digit Span by type with the effects of race, age, sex, and overall ability partialled out as covariates, failed to reach significance for the main effect of type, $F(1,87) = .002, p < .97$. The ANOVA of Digit Symbol by type with race, age, sex, and overall ability held constant as covariates, yielded an unexpected trend in the opposite direction of the prediction, $F(1,87) = 3.37, p < .10$. That is, intuitives scored slightly higher on Digit Symbol ($M=12.13$) than did sensing types ($M=12.61$).

A one way analysis of variance was performed for the sum of Similarities and Comprehension with race, age, sex, and overall ability as covariates. Unlike the earlier one way ANOVA on the sum of Similarities and Comprehension, significance employing these covariates was not attained, $F(1,87) = 2.14, p < .16$. The control for overall ability was indeed important in explaining the variance on these two verbal subtests. A one way analysis of variance was also performed on the sum of Digit Symbol and Digit Span, with race, age, sex and overall ability as

TABLE 2

Means and SD by Race of WAIS-R Subtests

	<u>Mean</u>	<u>SD</u>
<u>Similarities</u>		
White (N=17)	9.27	2.03
Black (N=9)	7.89	1.90
Hispanic (N=6)	7.33	1.96
Asian (N=7)	9.00	4.08
Missing (N=4)	9.50	3.10
<u>Comprehension</u>		
White	12.22	2.51
Black	10.78	4.18
Hispanic	9.00	1.89
Asian	11.14	4.01
Missing	10.25	2.99
<u>Digit Span</u>		
White	14.07	2.55
Black	13.89	3.25
Hispanic	10.16	2.71
Asian	11.86	1.86
Missing	16.00	2.45
<u>Digit Symbol</u>		
White	12.61	3.06
Black	10.56	3.00
Hispanic	10.00	5.32
Asian	13.57	4.20
Missing	13.00	4.96

TABLE 3

Means and SD by Sex of WAIS-R Subtests

	<u>MEAN</u>	<u>SD</u>
<u>Similarities</u>		
Males (N=27)	9.19	2.20
Females (N=66)	8.92	2.34
<u>Comprehension</u>		
Males	11.48	2.62
Females	11.80	3.03
<u>Digit Span</u>		
Males	14.11	2.59
Females	13.56	2.91
<u>Digit Symbol</u>		
Males	11.88	4.23
Females	12.51	3.09

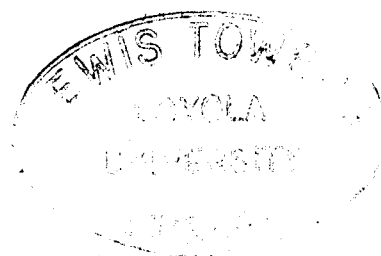


TABLE 4

Means and SD by Age of WAIS-R Subtests

	<u>Mean</u>	<u>SD</u>
<u>Similarities</u>		
17 years (N=17)	9.11	1.45
18 years (N=58)	9.10	2.25
19 years (N=16)	8.37	2.82
20 years (N=7)	8.85	2.12
>20 years (N=3)	10.33	0.00
<u>Comprehension</u>		
17 years	10.67	2.91
18 years	12.06	2.80
19 years	11.38	3.34
20 years	10.71	2.98
>20 years	12.00	0.00
<u>Digit Span</u>		
17 years	14.67	3.04
18 years	13.62	2.68
19 years	12.63	3.20
20 years	14.71	2.56
>20 years	16.67	0.00
<u>Digit Symbol</u>		
17 years	12.78	3.11
18 years	12.48	3.54
19 years	11.13	3.46
20 years	14.42	2.15
>20 years	9.67	0.00

covariates. Consistent with the earlier finding there was no significant main effect for type on this measure of attentional ability, $F(1,87) = 2.13, p < .16$. Again, overall ability was a major contributor to the variance on the sum of Digit Span and Digit Symbol, $F(1,87) = 116.4, p < .01$.

The hypotheses concerning how well intuitives and sensation types would fair on each subtest was further investigated using oneway ANOVAs between groups for the deviation score for each subtest. That is, an average subtest score for each subject was computed by taking the sum of Similarities, Comprehension, Digit Span, and Digit Symbol, and dividing by 4. The average score was then subtracted from each subtest score yielding a deviation score. According to the hypotheses, a positive deviation score would be indicative of an individual scoring relatively higher on that subtest as compared to his overall performance. Negative scores would indicate that the individual is scoring worse on that subtest relative to his overall performance. Means, standard deviations, and F values for both groups are presented in Table 5. The one way analysis of variance for the Comprehension subtest by type attained statistical significance, $F(1,91) = 1.95, p < .05$, with intuitives scoring significantly higher ($M = .62$) on the Comprehension subtest than did sensing types ($M = -.41$).

The hypothesis that the higher the preference strength of MBTI type the directionally stronger the prediction was assayed with oneway ANOVA's for each subtest by MBTI with a preference score greater than 20. This cutoff follows Myers (1962) statement that scores falling

TABLE 5

Means and SD's of Deviation Scores for MBTI Groups

	Mean	SD	F value
<u>Similarities</u>			
Sensation	-2.53	2.09	1.42
Intuition	-2.92	1.75	
<u>Comprehension</u>			
Sensation	-0.41	2.67	1.95 *
Intuition	0.62	1.91	
<u>Digit Span</u>			
Sensation	2.08	2.14	1.10
Intuition	1.96	2.24	
<u>Digit Symbol</u>			
Sensation	0.86	2.84	1.25
Intuition	0.33	2.54	

*p<.05

between 0-20 are indicative of individuals who have characteristics of both types and that scores of 20 or greater are indicators of a more clearly defined type. The F values were as follows: for Similarities $F(1,35) = 1.04, p < .98$ Comprehension $F(1,35) = 2.04, p < .10$ Digit Span $F(1,35) = 1.75, p < .10$ and Digit Symbol $F(1,35) = 1.23, p < .99$ The means and standard deviations, and F values for MBTI types with preference scores over 20 for the 4 WAIS-R subtests are found in Table 6. An inspection of the trend in the Comprehension subtest indicates that the direction of the trend is in the order predicted, with intuitives ($M=13.3$) scoring higher than sensing types ($M=11.2$). However, an examination of the Digit Span subtest shows a trend in the direction contrary to predicted, with intuitives having a mean of 14.9 outperforming sensing types with a mean of 13.0.

An inspection of Table 1 indicates that the group mean for sensing types on the WAIS-R subtests are in accord with the order predicted with Digit Span > Digit Symbol > Comprehension > Similarities. However, the group means for the intuitive types Digit Span > Comprehension > Digit Symbol > Similarities, ordinally differed from the hypothesized ordering of Similarities > Comprehension > Digit Symbol > Digit Span.

In order to test hypotheses concerning individual subjects subtest scores, binomial expansions, resulting in z scores were computed. Thus, for the computation of "hits" for highest individual subtests was derived from the number of intuitives scoring highest on the Similarities subtest plus the number of sensing types scoring highest on Digit Span. If an individual had 2 subtests with the highest score, the

TABLE 6

Means and SDs of MBTI Types with Preference Score >20

	Mean	SD	F value
<u>Similarities</u>			
Sensation	8.90	2.84	1.04
Intuition	8.93	2.79	
<u>Comprehension</u>			
Sensation	11.19	3.64	2.04 *
Intuition	13.31	2.54	
<u>Digit Span</u>			
Sensation	12.95	3.20	1.75*
Intuition	14.88	2.41	
<u>Digit Symbol</u>			
Sensation	11.76	3.53	1.23
Intuition	11.75	3.92	

*p<.10

investigator scored it a ".5 hit". This binomial expansion which combined intuitives scoring highest on Similarities with sensing types highest on Digit Span, yielded a $z=.29$, n.s.. The binomial expansion which regarded intuitives scoring higher on the sum of Similarities and Comprehension than on Digit Span and Digit Symbol, and sensing types scoring higher on the sum of Digit Span and Digit Symbol as hits yielded a $z = .83$, n.s.. Finally, a binomial expansion which regarded intuitives who scored in the order Similarities > Comprehension > Digit Symbol > Digit Span and sensing types who scored in the order Digit Span > Digit Symbol > Comprehension > Similarities as hits, and which considered one reversal in adjacent subtests as full hits yielded a $z = -.56$, n.s..

CHAPTER V

DISCUSSION

The purpose of this study was to examine the MBTI sensation-intuition dimension and selected WAIS-R subtests in order to determine the MBTI's capacity to differentiate particular cognitive abilities. It was postulated that if the two groups differed, then empirical support would be extended to the MBTI's capacity to provide information about differing cognitive styles of students and thereby give indications of learning strengths and weaknesses. This was considered potentially useful in that the broadly used MBTI is primarily grounded in the clinical tradition rather than on empirical investigation.

The basis of this investigation was that the sensation and intuition dimension of the MBTI reflects differential cognitive styles which would be reflected in WAIS-R subtest performance. While this major hypothesis received a modicum of support, it must be evaluated in light of major group findings.

Overall the major findings in the study concerned the intuitive group's dominant performance on the WAIS-R subtests. The intuitive group scored significantly higher on the sum of the four WAIS-R subtests than did the sensing types. The intuitive group scored significantly higher on the the sum of of Similarities and Comprehension than did the sensing types. In addition, the intuitive group scored significantly

higher on the Comprehension subtest than did the sensing types.

These results are consonant with literature in the field suggesting that the intuitive's high levels of cognition, employing verbally based logic and inference has its roots in the intuitives' ability to quickly translate words into meanings. These findings more specifically correlate with earlier studies of the MBTI sensation-intuition dimension indicating the intuitive types' tendency to outscore sensing types on overall measures of intelligence (Myers, 1962; Sundberg, 1965) as well as on academic aptitude measures, such as the SAT verbal ability scale (Myers, 1980). The generally greater academic ability found among intuitive is similarly reflected in the preponderance of intuitive types found among National Merit finalists and among Rhode Scholars. In addition intuitives may score higher on standard intelligence measures under timed conditions due to superior test taking techniques (Myers, 1980). This may account for the unexpected trend by intuitives in this study to score slightly higher than sensing types on Digit Symbol when "overall ability" and subject variables were partialled out as covariates.

The initial finding that intuitives performed better on the combined tests of Verbal Abstraction, (Similarities and Comprehension) was less strongly supported when "overall ability" was controlled for. That is, the intuitive group did not statistically differ from the sensing group when an ANOVA was performed controlling for "overall ability", (the sum of the four subtests) as well as the subject variables, (race, age, sex) as covariates on the sum of Similarities and Comprehension. Thus, the covariate, "overall ability" contributed significantly to to

variance.

However, one of the salient findings indicated that the Comprehension test taken alone, showed a marked difference in group means with intuitives ($\underline{M}=12.9$) outscoring sensing types ($\underline{M}=10.9$) by 2 points. The significant difference for the Comprehension subtest was maintained even when "overall ability", as well as race, age, and sex were partialled out as covariates. In accord with this finding there was a statistically significant difference for the Comprehension subtest deviation scores between intuitives and sensing types.

The differentiation of intuitives and sensing types on Comprehension subtest performance supports the postulated differences in cognitive processing style. One speculation concerns clinical interpretation of the Comprehension subtest which includes an ability to think ahead as well as hold impulses in control (Zimmerman & Woo-Sam, 1973) This is consonant with Jung's (1971) conceptualization of the intuitive type as insightful yet unlikely to quickly gratify impulsive strivings before engaging in some intellectual abstraction. Theoretically, the tendency toward intellectual proprocessing before acting would hold especially true for introverted intuitives and would hold least true for extraverted sensing types.

Paradoxically, for stronger preference intuitive and sensing types, there was only a trend for intuitives to score higher on Comprehension than sensing types, $\underline{F}(1,35) = 2.04, p < .06$. Also a trend in the opposite direction from the original prediction was found for stronger preference intuitives tending to score higher on Digit Span than the

stronger preference sensing types. The findings regarding more extreme types (preference score >20) for both intuitive and sensing groups are more difficult to interpret. Because the size of each group dwindled by approximately 60% when the preference score cutoff was employed, the possibility that a bias between the groups, confounding the findings cannot be ruled out. However, the trend that more extreme intuitives score higher on Digit Span than more extreme sensing types again appears to be related to the intuitives' ability to perform well under most test taking conditions (Myers, 1980).

In terms of individual subtest ordering for each group, sensing types as a group scored in the order predicted, (Digit Span > Digit Symbol > Comprehension > Similarities). Intuitives as a group did not score in the order predicted, (Digit Span > Comprehension > Digit Symbol > Similarities). Rather, they scored in the following order, (Similarities > Comprehension > Digit Symbol > Digit Span). The predicted individual scoring orders on subtests for both intuitives and sensing types did not attain statistical significance.

Although individuals in both groups did not attain the predicted ordinal position on subtest scoring, taken as a whole the mean subtest performances for sensing types attained the ordinal position predicted: Digit Span > Digit Symbol > Comprehension > Similarities. While this result must be interpreted cautiously, one extrapolation suggests that sensing types as a group tend to perform better on the Freedom from Distractability or attentional subtests than they do on subtests requiring a greater degree of verbal mediation. The ordinal position for subtests

for the intuitive group, (Digit Span > Comprehension > Digit Symbol > Similarities), also suggests a capacity to perform well on attentional tests in addition to the previously noted strengths in tasks requiring verbal mediation.

While the bulk of the results in this study are consistent with earlier studies indicating intuitives advantages in measures of intelligence and academic proficiency, traits other than cognitive functioning need to be considered in evaluating sensing and intuitive types differential abilities. As Myers (1980) has suggested, sensing types have a distinct advantage over intuitives in their capacity to work steadily to achieve realistic goals. Sensing types also have the capacity to work to a conclusion, exhibiting patience with routine details. Sensing types are good at precise work and rarely make factual errors. Such personality characteristics are frequently more critical to success in particular fields than is solely cognitive capacity. In addition, much of the intuitive advantage on tests of cognitive ability results from their natural interest in the meaning of words and in the valuing of verbal vability. As such, this would behove educators to become aware of inherent differences in sensing and intuitive students. Academic subjects might then be taught emphasizing the theoretical which would appeal to the intuitives, or with a practical and applied focus in order to engage sensing types.

Both the traditional literature on Jung's typology as well as investigations of the MBTI as its empirical extension, make a cogent case for the vastly differing perceptual and cognitive systems within

sensation and intuition. While the findings of the present study are not entirely clear-cut, there is supporting evidence to suggest that sensing and intuitive types do, in fact, display differing cognitive capacities. The extent to which their capacities can be utilized to maximize an individual's learning style, as well as the degree to which sensation and intuition interact with other MBTI dimensions, resulting in variations in cognitive styles, provide a basis for further exploration of this popular self report instrument.

APPENDIX A

THE FOUR PREFERENCES

ATTITUDES

Extraversion

focus on outer world with involvement in people and objects

Introversion

focus on inner world of concepts and ideas

FUNCTIONS

Perceiving functionsSensation

use of senses to perceive world in immediate, practical manner

Intuition

use of unconscious to perceive world in terms of hidden possibilities and meanings

Judging functionsThinking

use of logic to judge impersonal objective findings to make decisions

Feelings

use of values and impressions to make choices

Dominant functionJudging

planning, decisiveness, and orderliness in decision making

Perceiving

spontaneous, flexible way in decision making and adapting

APPENDIX B

THE MBTI: SENSATION-INTUITION SCALE

- 2) Do you usually get along better with
- a) imaginative people, or
 - b) realistic people
- 11) In doing something that many other people do, does it appeal to you more to
- a) do it in the accepted way, or
 - b) invent a way of your own
- 17) In reading for pleasure, do you
- a) enjoy odd and original ways of saying things, or
 - b) like writers to say exactly what they mean
- 37) Do you admire more the people who are
- a) conventional enough never to make themselves conspicuous, or
 - b) too original and individual to care whether they are conspicuous or not
- 53) Do you get more annoyed at
- a) fancy theories, or
 - b) people who don't like theories
- 64) Would you rather
- a) support the established methods of doing good, or
 - b) analyze what is still wrong and attack unsolved problems

70) Is it higher praise to say someone has

a) vision, or

b) common sense

(which word pair appeals to you more)

73) a) imaginative matter of fact b)

76) a) theory certainty b)

78) a) build invent b)

88) a) statement concept b)

90) a) production design b)

98) a) sensible fascinating b)

102)a) facts ideas b)

104)a) concrete abstract b)

107)a) make create b)

112)a)foundation spire b)

115)a)theory experience b)

117)a) sign symbol b)

119)a) literal figurative b)

121)a) accept change b)

128) If you were a teacher, would you rather teach

a) fact course, or

b) courses involving theory

140) Do you think it is more important to

a) be able to see the possibilities in a situation, or

b) be able to adjust to the facts as they are

145) Would you rather be considered

- a) a practical person, or
- b) an ingenious person

149) would you rather have as a friend someone who

- a) is always coming up with new ideas, or
- b) has both feet on the ground

165) In your way of living do you prefer to be

- a) original, or
- b) conventional

APPENDIX C

DIRECTIONS FOR ADMINISTRATION

- a) Have subjects pick up Wechsler Adult Intelligence Scale- Revised (WAIS-R) answer sheets and Myers-Briggs Type Indicators (MBTI).
- b) Read Introduction for Participating Subjects.
- c) Have subjects fill out demographic section on the MBTI.
- d) Administer WAIS-R Comprehension subtest. Have subjects write complete answers.
- e) Administer WAIS-R Digit Span subtest. Read the entire digits, backward and forward. Tell the subjects that, "The numbers become progressively more difficult, so don't worry if you are not able to recall them all."
- f) Administer WAIS-R Digit Symbol subtest. Allow subjects to complete the sample items so that they have the general idea before beginning.
- g) Administer WAIS-R Similarities subtest. Have subjects write complete responses using as many words as they require.
- h) Administer the MBTI.

APPENDIX D

INTRODUCTION READ TO PARTICIPATING SUBJECTS

The estimated time to fill out a personality inventory and four short paper and pencil tests should be less than an hour and a half.

You will first take four short aptitude tests. Next, you will be asked to fill out a personality inventory based on the imaginative and comprehensive personality theory of Carl Jung. We are interested in how certain personality types display different abilities and not in your individual performance. Thus, everything you fill out is precoded with a number, to match only materials and will not identify you. You may drop out of the experiment at any time. Thank you for your participation.

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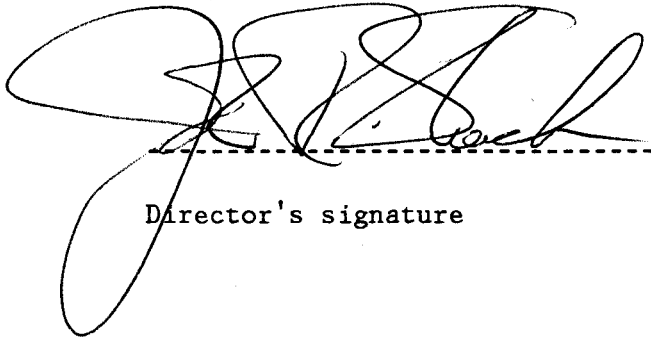
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The final copies have been examined by the Director of this thesis and the signature which appears below verifies the fact that the thesis is now given final approval by the Committee with reference to content and form.

The thesis is therefore accepted in partial fulfillment of the requirements for the degree of Masters of Arts.

11/25/85

Date



Director's signature